MATHPOWER™ Seven

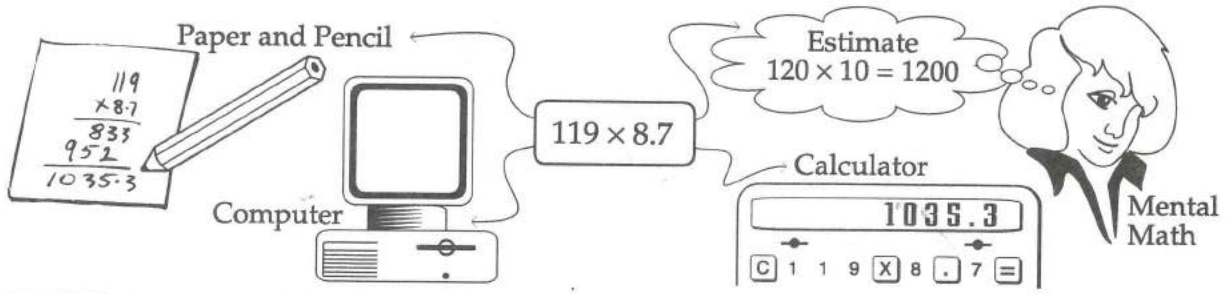
BLACKLINE MASTERS

CONTENTS

Name _____

1.1 Choosing a Calculation Method

MATHPOWER™ *Seven*, pp. 4–5



State whether you need an exact answer or an approximate answer.

1. You are attending a basketball game. What time must you arrive? _____

2. How much money do you need to take with you on a week's vacation? _____

3. You are buying a calculator. What is the total cost? _____

4. What is the mass of the animal with the greatest mass? _____

5. How much sugar is needed for a cookie recipe? _____

6. How many pages are there in the novel you are reading? _____

7. On what date did the first astronaut step on the moon? _____

8. How much drinking water will you need to take on a fishing trip? _____

Choose a calculation method for each of the following statements.

9. You are keeping score in a game of Scrabble®. _____

10. You want to check the amount you were charged for long-distance telephone calls. _____

11. You are charged $8.50 each day that you leave your dog in the kennel. Your trip will last 8 days. _____

12. You are a school secretary, responsible for recording and calculating the percent of student absences each month. _____

13. You are ordering four CDs from the Disc Club and want to know how much you will be charged. _____

14. You are shopping for carpet for your room. _____

Choose a calculation method. Then, evaluate each expression.

15. $250 \div 50$ _____

16. $1105 + 295$ _____

17. 15.4×0.6 _____

18. 123×87 _____

19. 1000×34 _____

20. $9 + 8 - 5$ _____

21. Mary Ann's Cycle Shop recorded the following sales for one week.

Monday	$438.25	Thursday	$2054.37
Tuesday	$1364.89	Friday	$3863.52
Wednesday	$875.68	Saturday	$4178.06

a) Write one question that requires an approximate answer and one that requires an exact answer.

b) Answer your questions.

_____

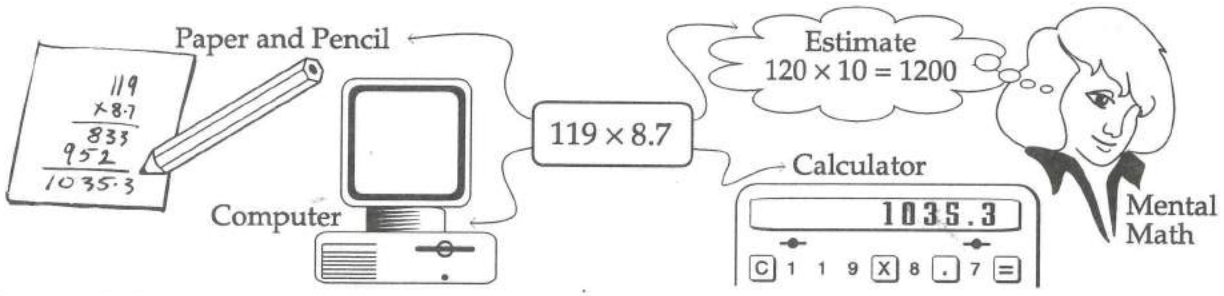
_____

_____

Name _____

1.1 Choosing a Calculation Method

MATHPOWER™ *Seven*, pp. 4–5



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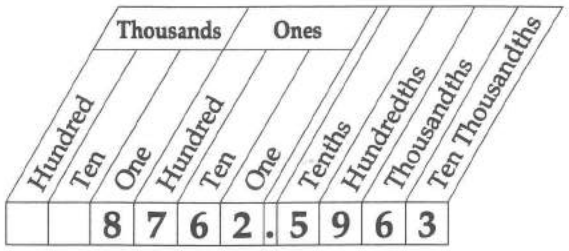
_____

Name _____

1.2 Place Value

MATHPOWER™ *Seven*, pp. 8–9

A place value table can help you read and write numbers.



Read decimal numbers by naming the place value of the final digit.

0.247 → two hundred forty-seven thousandths

Read "and" for the decimal point.

29 375.56 → twenty-nine thousand three hundred seventy-five and fifty-six hundredths

State the total value of each underlined digit.

1. 2̲3.45 _____
2. 1̲9 789 456 _____
3. 457.386̲4 _____

Write each number in standard form.

4. eight thousand three hundred two _____
5. two million thirty-three thousand five hundred four _____
6. six and five tenths _____
7. one thousand thirteen and eight hundred forty-nine thousandths _____

Write each number in words.

8. 2894 _____

_____

9. 687.95 _____

_____

10. 0.357 _____

_____

11. 1976.089 _____

_____

Write each number in standard form.

12. 10 000 + 3000 + 8 _____
13. 4 × 1 000 000 + 6 × 10 000 + 9 × 1000 + 6 × 100 + 4 × 1

_____

14. 3 × 10 + 5 × 1 + 4 × 0.1 + 2 × 0.01

_____

15. 300 + 40 + 2 + 0.1 + 0.08 + 0.007

_____

Write in expanded form.

16. 203 _____
17. 34.127 _____

_____

18. 276.13 _____

_____

19. 34 123 006 _____

_____

Insert >, =, or < to make each statement true.

20. 34.56 ☐ 30 + 4 + 0.05 + 0.006
21. 12 309 ☐ 10 000 + 2000 + 300 + 90
22. 35.7 ☐ 30 + 0.05 + 0.007
23. 5.01 ☐ 5 + 0.01
24. The points awarded to the winners in the men's Olympic platform diving competition are shown. Order them from highest to lowest.

Year	Points	Year	Points
1972	504.12	1984	710.91
1976	600.51	1988	638.61
1980	835.65	1992	677.31

_____

Name _____

1.3 Rounding Numbers: Mental Math

MATHPOWER™ *Seven*, pp. 10–11

If the digit to the right of the place you are rounding is 5 or more, add 1 to the digit being rounded.

3273
↓
3300

If the digit to the right of the place you are rounding is less than 5, do not change the digit being rounded.

6.931
↓
6.93

Round the number 573 872 to these place values.

1. to the nearest 10 _____
2. to the nearest 100 _____
3. to the nearest 1000 _____
4. to the nearest 10 000 _____
5. to the nearest 100 000 _____

Round the number 34.1834 to these place values.

6. to the nearest tenth _____
7. to the nearest hundredth _____
8. to the nearest thousandth _____
9. to the nearest one _____

Complete the table.

	Number	Nearest One	Nearest Tenth	Nearest Hundredth
10.	35.958			
11.	146.372			
12.	93.525			
13.	555.321			
14.	46.396			
15.	826.119			

Round to the indicated place value.

16. 6085 to the nearest hundred _____
17. 51 672 to the nearest ten thousand _____
18. 321.6396 to the nearest thousandth _____

Round to the indicated place value.

19. 721.168 to the nearest tenth _____
20. 45.082 to the nearest one _____
21. 734.132 to the nearest ten _____

Write the place value to which each number has been rounded.

22. 34.375 → 34.4 _____
23. 423.34 → 400 _____
24. 618.932 → 619 _____
25. 75.847 → 75.85 _____
26. 547.13 → 550 _____
27. 43.1365 → 43.137 _____

Complete the table.

	River	Length (km)	Nearest Hundred	Nearest Thousand
28.	Mackenzie	4241		
29.	St. Lawrence	3058		
30.	Yukon	3185		
31.	Peace	1923		
32.	Athabasca	1231		
33.	Ottawa	1271		

What digits can you insert so that

34. 4 ☐ 6 rounds to 500? _____
35. 32.56 ☐ rounds to 32.56? _____
36. 2.5 ☐ 5 rounds to 2.5? _____
37. 5 ☐ 67 rounds to 6000? _____
38. 13 4 ☐ 9 rounds to 13 400? _____
39. 12. ☐ 88 rounds to 13? _____

Name _____

1.4 Problem Solving: Look for a Pattern

MATHPOWER™ *Seven*, pp. 14–15

Understand the Problem → **Think of a Plan** → **Carry Out the Plan** → **Look Back**

Write the next four numbers in each sequence. State the pattern.

1. 1, 5, 9, 13, _____, _____, _____, _____

_____

2. 2, 4, 8, 16, _____, _____, _____, _____

_____

3. 75, 74, 72, 69, _____, _____, _____, _____

_____

4. Determine the pattern to complete the last two statements without calculating.

$9 \times 1 + 2 = 11$
$9 \times 12 + 3 = 111$
$9 \times 123 + 4 = 1111$
$9 \times 1234 + 5 = 11\,111$
$9 \times 12\,345 + 6 =$ _____

$9 \times 123\,456 + 7 =$ _____

5. Determine the pattern and complete the last two statements without calculating.

$1 \times 8 + 1 = 9$
$12 \times 8 + 2 = 98$
$123 \times 8 + 3 = 987$
$1234 \times 8 + 4 = 9876$
$12\,345 \times 8 + 5 =$ _____

$123\,456 \times 8 + 6 =$ _____

Determine a pattern and complete the tables.

6.

4	13
6	15
10	19
13	
16	
21	

7.

24	12
20	10
16	8
12	
8	
4	

Determine a pattern and complete the tables.

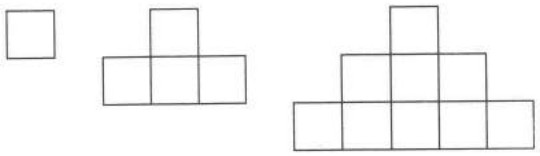
8.

2	7
6	19
4	13
3	
7	
5	

9.

2	3
5	12
4	9
8	
	6
	15
	18

A pattern is drawn by adding a new row of squares each time.



Use the pattern to determine the number of squares in each of the following rows.

10. the sixth row _____

11. the ninth row _____

12. the twelfth row _____

13. A guessing game requires one player to guess the pattern used by another player. Michael picks a number. Yoko calculates a response. Use the table to find the pattern that Yoko used.

Number	1	2	4	5	7	8
Response	5	15	35	45	65	75

Pattern: _____

_____

_____

Name _____

1.5 Estimating Sums and Differences: Mental Math

MATHPOWER™ *Seven*, pp. 16–17

Use rounding to estimate sums and differences.

$$\begin{array}{rcl} 1130 & \longrightarrow & 1100 \\ -\ 480 & \longrightarrow & -\ 500 \\ \hline & & 600 \end{array}$$

Round each number and add or subtract mentally.

Estimates may vary with the place value you choose for rounding.

$$\begin{array}{rcl} 7.74 & \longrightarrow & 8 \\ +\ 0.19 & \longrightarrow & +\ 0 \\ \hline & & 8 \end{array} \quad \text{OR} \quad \begin{array}{r} 7.7 \\ +\ 0.2 \\ \hline 7.9 \end{array}$$

Write each question using rounded numbers, then find an estimated answer.

1. $\begin{array}{r} 536 \\ +\ 294 \\ \hline \end{array}$ + _____

2. $\begin{array}{r} 793 \\ -\ 146 \\ \hline \end{array}$ − _____

3. $\begin{array}{r} 43.8 \\ -\ 21.9 \\ \hline \end{array}$ − _____

4. $\begin{array}{r} 92.38 \\ +\ 75.16 \\ \hline \end{array}$ + _____

5. $\begin{array}{r} 36.12 \\ 45.87 \\ 9.25 \\ 11.13 \\ +\ 23.76 \\ \hline \end{array}$ + _____

6. $\begin{array}{r} 27.48 \\ -\ 0.69 \\ \hline \end{array}$ − _____

Estimate.

7. $\begin{array}{r} 3600 \\ 2431 \\ +5987 \\ \hline \end{array}$

8. $\begin{array}{r} 23.7 \\ 35.6 \\ 46.1 \\ +\ 45.5 \\ \hline \end{array}$

9. $\begin{array}{r} 47\,890 \\ -\ 31\,987 \\ \hline \end{array}$

10. $\begin{array}{r} 781.67 \\ -\ 542.78 \\ \hline \end{array}$

11. $\begin{array}{r} 3.427 \\ -\ 0.534 \\ \hline \end{array}$

12. $\begin{array}{r} 56.29 \\ 2.58 \\ +\ 0.62 \\ \hline \end{array}$

13. 368 + 498 + 521 + 673 _____

14. 3567.4 − 3241.42 _____

15. 5168 − 345 _____

State the smallest number of whole dollars needed to pay each total cost.

16. $11.33 + $45.89 _____

17. $325.42 + $78.69 _____

18. $58.20 + $35.60 + $28.20 _____

19. $24.98 + $35.95 + $45.50 + $12.01 _____

20. $0.89 + $1.23 + $0.65 _____

21. The average mass of an elephant is 4615 kg. The average mass of a grizzly bear is 336 kg. How much greater is the mass of the elephant than the mass of the grizzly bear?

_____

22. Brandon purchased a birthday present for his sister for $17.89. He bought a card for $2.13 and wrapping paper for $4.03. How much money did he spend altogether?

_____

23. The Changs travelled 175 km, 198 km, 213 km, 226 km, 142 km, and 275 km on a 6-day trip.

a) Estimate the total distance they travelled.

_____

b) About how much farther did they travel on the third day than on the first day?

_____

Name _____

1.6 Adding and Subtracting Numbers

MATHPOWER™ *Seven*, pp. 18–19

Align decimal points when adding and subtracting.

Check by estimating.

326.75	300
5103.048	5100
31.35	30
+ 492.67	+ 500
5953.818	5930

Check by estimating.

7823.89	7800
− 3471.902	− 3500
4351.988	4300

Calculate. Check by estimating.

1. 158 + 427

2. 4287 − 2149

3. 34 571 + 62 498

4. 52.123 + 213.57 + 4.129 + 254.081

5. 3476.21 − 1927.09

6. 7398.3 + 966.32 + 8109.25 + 322.45 + 1000.01

Complete the calculation grid.

	+	21.95	20.963	184.7	53.08
7.	299				
8.	16.54				
9.	178.09				
10.	95.87				

Complete the calculation grid. The first subtraction has been done for you.

	−	106	72.51	250.4	412.35
11.	47	59			
12.	2.96				
13.	68.08				
14.	38.98				

Calculate.

15. 532 + 678 + 984 − 357 _____

16. 23.54 − 17.28 + 34.21 _____

Calculate.

17. 11 093 − 2356 + 42 683 _____

18. 129.48 + 135.67 + 0.08 + 1.24 _____

19. 1356.78 − 341.23 − 156.78 _____

20. 400 + 32.56 + 12.468 − 301.12 _____

Find the missing numbers.

21. 34 783 + ☐ = 68 391

22. 3467 − ☐ = 2934

23. 45.167 − ☐ = 12.083

24. 122.433 + ☐ = 345.824

25. In 1990, 213 334 people immigrated to Canada. Of that number, 6057 came from the United States. How many people came from other parts of the world?

_____

26. Ramana had $23.00 when she arrived at the mall. She purchased a shirt for $11.89, a book for $4.99, and a candy bar for $0.85. How much money did she have left?

_____

27. The depths of five of the deepest caves are 1602.03 m, 1507.85 m, 1441.09 m, 1353.01 m, and 1218.90 m. What is the difference in depth between the deepest cave and the fifth deepest cave?

_____

Name _____

1.7 Problem Solving: Guess and Check

MATHPOWER™ *Seven*, pp. 20–21

1. What am I? If you multiply me by 26 and add 64, the result is 1000.

_____

2. What am I? If you divide me by 5 and subtract 12, the result is 8.

_____

3. Samira has $7.25 in quarters and nickels. She has 5 more quarters than nickels. How many of each coin does she have?

_____

4. Jared and Danielle have $32.00 between them. If Danielle gives Jared $4.00, they will both have the same amount. How much money does each have?

_____

5. Use the digits 1, 3, 5, and 7 to make two numbers whose product is 1767.

_____

6. The product of two numbers is 4187. The digits are 3, 5, 7, and 9. What are the two numbers?

_____

7. The square of a whole number is 2809. What is the number?

_____

8. Find the whole number whose square is closest to 800.

_____

Use the digits 4, 5, 6, 7, 8, and 9 to find the following. You may use each digit only once.

9. largest sum

$$\square\,\square\,\square + \square\,\square\,\square$$

10. smallest product

$$\square\,\square\,\square \times \square\,\square\,\square$$

Summer membership in the tennis club costs $100.00 for a family or $45.00 for an individual.

11. Pierre sold 15 memberships and collected $1170.00. How many family and individual memberships did he sell?

_____

12. Marla sold 22 memberships and collected $1815.00. How many family and individual memberships did she sell?

_____

Name _____

1.8 Multiplying by Powers of Ten: Mental Math
1.9 Using Powers of Ten: Mental Math

MATHPOWER™ *Seven*, pp. 22–23

For powers of ten greater than 1, the decimal point moves to the right as many places as there are zeros in the power.

$18.3 \times 10 = 183$
$18.3 \times 100 = 1830$
$18.3 \times 1000 = 18\,300$

$8 \times 30 = 240$
$8 \times 300 = 2400$
$8 \times 3000 = 24\,000$

For powers of ten less than 1, the decimal point moves to the left as many places as there are decimal places in the power.

$18.3 \times 0.1 = 1.83$
$18.3 \times 0.01 = 0.183$
$18.3 \times 0.001 = 0.0183$

$8 \times 0.3 = 2.4$
$8 \times 0.03 = 0.24$
$8 \times 0.003 = 0.024$

Complete the tables.

	Number	× 10	× 100	× 1000
1.	78			
2.	6.2			
3.	11.7			
4.	4.21			
5.	75.98			

	Number	× 0.1	× 0.01	× 0.001
6.	23			
7.	4.8			
8.	79.6			
9.	2.37			
10.	31.01			

	Number	× 20	× 200	× 2000
11.	2			
12.	7			
13.	12			
14.	0.4			
15.	30			

	Number	× 0.4	× 0.04	× 0.004
16.	6			
17.	4			
18.	11			
19.	25			
20.	50			

Multiply.

21. 0.124×10 _____

22. 137.42×0.01 _____

23. 6.35×100 _____

24. 72.6×0.01 _____

25. 322×0.001 _____

26. 15.6×100 _____

27. 83.02×0.01 _____

28. 7.02×1000 _____

29. 13×0.01 _____

30. 37.9×0.001 _____

Multiply.

31. 0.03×600 _____

32. 40×0.007 _____

33. 6000×0.2 _____

34. 800×40 _____

35. 0.5×8000 _____

36. 30×4000 _____

37. 0.003×70 _____

38. 600×0.04 _____

39. Find the sum of 314.75×0.1 and 212.3×10.

_____

40. Find the difference between 5.34×100 and 156.8×0.01.

_____

Name _____

1.10 Estimating Products: Mental Math

MATHPOWER™ *Seven*, pp. 24–25

To estimate products, round to the greatest place value of each number and multiply mentally.

$$\begin{array}{r} 580 \longrightarrow 600 \\ \times 4.2 \longrightarrow \times 4 \end{array}$$

When estimating with decimals less than 1, look for numbers that are close to 1 or to 0.5.

$$\begin{array}{rcr} 0.532 & \longrightarrow & 0.5 \\ \times 7.6 & \longrightarrow & \times 8 \\ \hline 2400 & & 4 \end{array}$$

Write each question using rounded numbers, then find an estimated answer.

1. $\begin{array}{r} 37 \\ \times 6.1 \end{array}$ $\times$ _____

2. $\begin{array}{r} 419 \\ \times 33 \end{array}$ $\times$ _____

3. $\begin{array}{r} 764 \\ \times 6.8 \end{array}$ $\times$ _____

4. $\begin{array}{r} 42.5 \\ \times 3.9 \end{array}$ $\times$ _____

Circle the best estimate, a), b), or c), of each product.

5. $\begin{array}{r} 34 \\ \times 65 \end{array}$ **a)** 2000 **b)** 2100 **c)** 3000

6. $\begin{array}{r} 18.72 \\ \times 49 \end{array}$ **a)** 1000 **b)** 720 **c)** 900

7. $\begin{array}{r} 642 \\ \times 2.7 \end{array}$ **a)** 2100 **b)** 1900 **c)** 1800

8. $\begin{array}{r} 398 \\ \times 7 \end{array}$ **a)** 1200 **b)** 2400 **c)** 2800

9. $\begin{array}{r} 426 \\ \times 19 \end{array}$ **a)** 8600 **b)** 8000 **c)** 10 000

Estimate each product. Look for numbers close to 1 or 0.5.

10. 0.14×0.68 _____

11. 0.98×16 _____

12. 640×0.83 _____

13. 42×0.64 _____

14. 17.8×0.46 _____

15. 0.91×173 _____

16. 1.03×73 _____

17. 583.4×1.8 _____

Estimate each product.

18. 1.8×7.8 _____

19. 23.5×18.1 _____

20. $67\,000 \times 0.87$ _____

21. 3100×365 _____

22. 9208.1×0.28 _____

23. 675.9×4801 _____

24. 173×84 _____

25. 426.3×9.4 _____

26. 98.6×103 _____

27. 567×2.3 _____

28. 312.8×202.6 _____

29. 3.562×12.13 _____

State the smallest number of whole dollars needed to pay each amount.

30. 14 at \$11.56 _____

31. 9 at \$175.01 _____

32. 31 at \$67.55 _____

33. 101 at \$20.02 _____

34. 22 at \$58.73 _____

35. Ahmed bought 8 plants. Each one cost \$18.49. Estimate how much he paid.

_____

36. Janelle drove at 95 km/h from 10:15 to 12:30. Estimate the distance she drove.

_____

Name _____

1.11 Multiplying Numbers

MATHPOWER™ *Seven*, pp. 26–27

When decimals are multiplied, the number of decimal places in the product is the same as the number in the factors.

$$\begin{array}{r} 82.26 \leftarrow \text{2 decimal places} \\ \times\ 0.98 \leftarrow \text{2 decimal places} \\ \hline 65808 \\ 74034 \\ \hline 80.6148 \leftarrow \text{4 decimal places} \end{array}$$

Check by estimating.

$80 \times 1 = 80$

Estimate, then multiply.

1.	$\begin{array}{r} 23 \\ \times\ 8 \\ \hline \end{array}$	**2.**	$\begin{array}{r} 84 \\ \times\ 7 \\ \hline \end{array}$	**3.**	$\begin{array}{r} 1.2 \\ \times\ 0.4 \\ \hline \end{array}$
4.	$\begin{array}{r} 8.7 \\ \times\ 6 \\ \hline \end{array}$	**5.**	$\begin{array}{r} 27 \\ \times\ 0.7 \\ \hline \end{array}$	**6.**	$\begin{array}{r} 56 \\ \times\ 0.9 \\ \hline \end{array}$
7.	$\begin{array}{r} 439 \\ \times\ 7 \\ \hline \end{array}$	**8.**	$\begin{array}{r} 3.02 \\ \times\ 9 \\ \hline \end{array}$	**9.**	$\begin{array}{r} 4.15 \\ \times\ 0.3 \\ \hline \end{array}$

Estimate, then multiply.

10.	$\begin{array}{r} 48 \\ \times\ 23 \\ \hline \end{array}$	**11.**	$\begin{array}{r} 29 \\ \times\ 72 \\ \hline \end{array}$	**12.**	$\begin{array}{r} 3.4 \\ \times\ 53 \\ \hline \end{array}$
13.	$\begin{array}{r} 7.5 \\ \times\ 61 \\ \hline \end{array}$	**14.**	$\begin{array}{r} 0.23 \\ \times\ 1.5 \\ \hline \end{array}$	**15.**	$\begin{array}{r} 6.2 \\ \times\ 3.7 \\ \hline \end{array}$
16	$\begin{array}{r} 4.7 \\ \times\ 2.6 \\ \hline \end{array}$	**17.**	$\begin{array}{r} 34 \\ \times\ 0.47 \\ \hline \end{array}$	**18.**	$\begin{array}{r} 18.86 \\ \times\ 8.7 \\ \hline \end{array}$

Multiply.

19.	$\begin{array}{r} 312 \\ \times\ 43 \\ \hline \end{array}$	**20.**	$\begin{array}{r} 417 \\ \times\ 2.8 \\ \hline \end{array}$
21.	$\begin{array}{r} 78.6 \\ \times\ 5.3 \\ \hline \end{array}$	**22.**	$\begin{array}{r} 63.4 \\ \times\ 24 \\ \hline \end{array}$
23.	$\begin{array}{r} 840 \\ \times\ 0.5 \\ \hline \end{array}$	**24.**	$\begin{array}{r} 0.034 \\ \times\ 130 \\ \hline \end{array}$

Multiply.

25.	$\begin{array}{r} 6245 \\ \times\ 134 \\ \hline \end{array}$	**26.**	$\begin{array}{r} 7019 \\ \times\ 526 \\ \hline \end{array}$
27.	$\begin{array}{r} 8274 \\ \times\ 6.1 \\ \hline \end{array}$	**28.**	$\begin{array}{r} 481.3 \\ \times\ 3.6 \\ \hline \end{array}$
29.	$\begin{array}{r} 345.1 \\ \times\ 0.86 \\ \hline \end{array}$	**30.**	$\begin{array}{r} 306.8 \\ \times\ 5.32 \\ \hline \end{array}$

Find the value of each ☐.

31.

$$\begin{array}{r} \square\,8\,9 \\ \times\ \square\,6 \\ \hline 1\,7\,3\,\square \\ 8\,\square\,7 \\ \hline \square\square\square\square \end{array}$$

32.

$$\begin{array}{r} 5\,\square \\ \times\ 4\,3 \\ \hline 1\,\square\,8 \\ 2\,2\,4 \\ \hline \square\square\square\square \end{array}$$

33. Rachel earns $4.75 an hour cutting lawns during the summer. If she works 28 h each week, how much does she earn in a week?

_____

34. It is estimated that a human can jump 6 times higher on the moon than on the Earth. How high can an athlete jump on the moon if she is able to jump 2.36 m on Earth?

_____

35. Mt. King, in the Yukon Territories, is 5173 m high. Mt. Everest is the highest mountain in the world. It is about 1.7 times as high as Mt. King. About how tall is Mt. Everest?

_____

Name _____

1.12 Dividing by Powers of Ten: Mental Math

MATHPOWER™ *Seven*, pp. 28–29

For powers of ten greater than 1, the decimal point moves to the left as many decimal places as there are zeros in the power.

$238 \div 10 = 23.8$

$238 \div 100 = 2.38$

$238 \div 1000 = 0.238$

For powers of ten less than 1, the decimal point moves to the right as many places as there are decimal places in the power.

$238 \div 0.1 = 2380$

$238 \div 0.01 = 23\,800$

$238 \div 0.001 = 238\,000$

Complete the following table.

	Number	÷ 10	÷ 100	÷ 1000
1.	346			
2.	62.9			
3.	9003			
4.	4.76			
5.	700			

Complete this table.

	Number	÷ 0.1	÷ 0.01	÷ 0.001
6.	34			
7.	8.3			
8.	68.2			
9.	2.75			
10.	49.01			

Simplify.

11. $321 \div 10$ _____

12. $5.34 \div 10$ _____

13. $243.78 \div 100$ _____

14. $43.9 \div 100$ _____

15. $0.933 \div 100$ _____

16. $14.7 \div 1000$ _____

17. $64.91 \div 10$ _____

18. $80.9 \div 1000$ _____

19. $63 \div 100$ _____

20. $84.8 \div 1000$ _____

Simplify.

21. $0.02 \div 0.01$ _____

22. $50 \div 0.001$ _____

23. $7000 \div 0.1$ _____

24. $200 \div 0.1$ _____

25. $0.3 \div 0.01$ _____

26. $40 \div 0.001$ _____

27. $0.008 \div 0.1$ _____

28. $900 \div 0.01$ _____

29. Find the sum of $731.45 \div 0.1$ and $322.1 \div 10$.

_____

30. Find the difference between $4350 \div 100$ and $0.15 \div 0.01$.

_____

31. Subtract $0.329 \div 0.01$ from the sum of $5000 \div 10$ and $27.07 \div 0.1$.

_____

32. Chantel paid $13.75 for 10 tennis balls. How much was each ball?

_____

33. Rashid walked 1000 m in 6 min. About how long did it take him to walk 100 m?

_____

Name _____

1.13 Estimating Quotients: Mental Math

MATHPOWER™ *Seven*, p. 30

To estimate quotients mentally, round the numbers so that one number is a multiple of the other. Then, divide the numbers.

$25.4 \div 8$	$466 \div 37.5$	$22.9 \div 4.83$	$16.8 \div 0.9$
$= 24 \div 8$	$= 480 \div 40$	$= 20 \div 5$	$= 17 \div 1$
$= 3$	$= 12$	$= 4$	$= 17$

Round the dividend to be a multiple of the divisor. Estimate the quotient.

1. $\frac{34.8}{6} =$ _____ $=$ _____

2. $\frac{24.5}{3} =$ _____ $=$ _____

3. $\frac{152}{8} =$ _____ $=$ _____

4. $\frac{37.9}{6} =$ _____ $=$ _____

5. $\frac{256.4}{5} =$ _____ $=$ _____

6. $\frac{171}{10} =$ _____ $=$ _____

7. $\frac{331.7}{4} =$ _____ $=$ _____

8. $\frac{106.5}{9} =$ _____ $=$ _____

9. $\frac{483.1}{7} =$ _____ $=$ _____

10. $\frac{586.6}{2} =$ _____ $=$ _____

Estimate each quotient.

11. $15.3 \div 2.7$ _____

12. $28.9 \div 4.6$ _____

13. $73.1 \div 8.3$ _____

14. $51.6 \div 6.9$ _____

15. $345.7 \div 7.4$ _____

16. $546.2 \div 8.8$ _____

17. The store is selling 6 bottles of pop for $3.92. Estimate the cost of each bottle.

_____

18. The kindergarten teacher is making name tags from 2.5 m of ribbon. Each tag is 11 cm long. How many tags can he make?

_____

19. The cycle club held a car wash and asked for a donation for each car washed. The club collected $412.50 for washing 158 cars. Estimate the donation for each car.

_____

Estimate the cost of 1 kg of each food, given the following prices.

20. 2.4 kg of cheese cost $23.76.

_____

21. 4.8 kg of bananas cost $3.30.

_____

22. 3.7 kg of tomatoes cost $5.36.

_____

23. 7.2 kg of potatoes cost $5.68.

_____

Name _____

1.14 Short Division
1.15 Dividing Numbers

MATHPOWER™ *Seven*, pp. 32–35

To simplify dividing by a decimal, multiply the divisor by a power of ten to make it a whole number. Multiply the dividend by the same power of ten.

$0.056 \div 0.14 = (0.056 \times 100) \div (0.14 \times 100)$
$= 5.6 \div 14$
$= 0.4$

Place the decimal point in the quotient directly above the decimal point in the dividend and divide as with whole numbers.

$14\overline{)5.6}$ $\quad 0.4$

Check by multiplying.
$0.4 \times 0.14 = 0.056$

Circle the best estimate.

1. $32\overline{)316}$

15 5 10

2. $18\overline{)983}$

70 90 50

3. $42\overline{)789}$

60 40 20

4. $65\overline{)2754}$

90 70 40

Divide using short division. State the remainder.

5. $7\overline{)564}$

6. $9\overline{)734}$

7. $8\overline{)4178}$

8. $6\overline{)5387}$

9. $3\overline{)3709}$

10. $8\overline{)3665}$

Estimate, then divide.

11. $7\overline{)0.56}$

12. $5\overline{)2.75}$

13. $3\overline{)6.84}$

14. $6\overline{)0.084}$

15. $3\overline{)38.91}$

16. $8\overline{)18.08}$

17. $4\overline{)5.036}$

18. $9\overline{)845.1}$

Rewrite each question with the divisor as a whole number. Calculate each answer.

19. $\frac{0.06}{0.2}$ _____

20. $\frac{0.72}{0.3}$ _____

21. $0.05\overline{)15.5}$

22. $0.4\overline{)28.4}$

Estimate, then calculate. Round your answer to the nearest tenth.

23. $16\overline{)378}$

24. $19\overline{)800}$

25. $13\overline{)42}$

26. $0.4\overline{)0.17}$

27. $0.05\overline{)0.2385}$

28. $0.06\overline{)369}$

Divide. Round your answer to the nearest tenth.

29. $0.3\overline{)4.77}$

30. $0.45\overline{)0.587}$

31. $5.4\overline{)36.1}$

32. $0.6\overline{)0.768}$

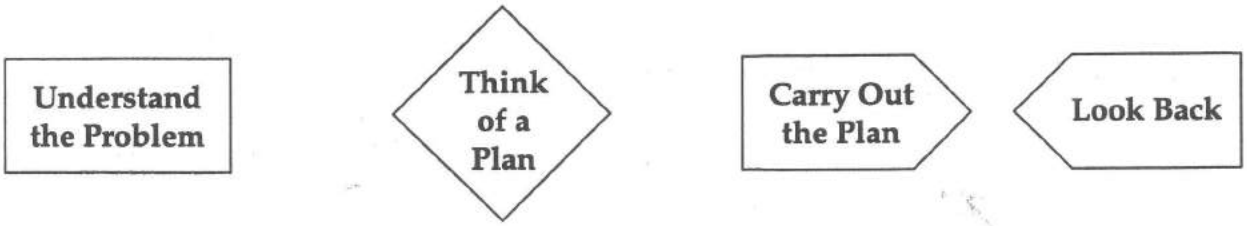
33. $47\overline{)32\,014}$

34. $45\overline{)91\,764}$

Name _____

1.16 Problem Solving: Make an Assumption

MATHPOWER™ *Seven*, pp. 36–37



Determine a pattern and make an assumption. Then, list the next 3 terms.

1. 100, 98, 94, 88, _____, _____, _____

2. 15, 21, 27, 33, _____, _____, _____

3. 0, 3, 7, 10, _____, _____, _____

4. The Kerels paid $98.84 for hydro in March this year. How much will they pay for hydro in one year? What assumptions have you made?

_____

_____

5. Connor rode his bicycle 3 km in 4 min. How far could he ride in 2 h? What assumptions have you made?

_____

_____

6. The student council purchased 6 cases of cola, 2 cases of ginger ale, and 2 cases of orange soda for the dance. What assumptions did they make?

_____

_____

7. Each week, Mr. Blake purchases two 4-L bags of milk for his family. This week, milk cost $3.29 for a bag. How much will he spend on milk in a year? What assumptions have you made?

_____

_____

8. In her job at the supermarket, Jenny had to unpack a case of 48 cans of soup. She thought she would stack them in 2 layers, with 8 rows of 3 cans in each layer. What assumptions did she make?

_____

For each pair of numbers, name a third number that could be next in the sequence.

9. 9, 6, _____ **10.** 3, 8, _____

11. 12, 24, _____ **12.** 2, 8, _____

13. a) What assumptions did you make in questions 9–12 to determine each pattern?

_____

_____

_____

b) Suggest a different third number for each original pair of numbers in questions 9–12. What assumptions have you made this time?

_____

_____

_____

14. A city councillor conducted a survey. She asked every 10th household whether or not they were in favour of the city developing a community playground in the neighbourhood. The results showed that 65% were in favour of the plan.

a) What assumptions might the councillor make from her survey?

_____

_____

b) Do you think the survey is accurate for the whole neighbourhood? Explain.

_____

_____

_____

Name _____

1.17 Order of Operations

MATHPOWER™ *Seven*, pp. 38–39

Do the calculations in brackets first.

Change "of" to ×.

Divide and multiply in order from left to right.

Add and subtract in order from left to right.

$\frac{1}{3}$ of $(6 \times 4) - 8 \div 2$

$= \frac{1}{3}$ of $(24) - 8 \div 2$

$= \frac{1}{3} \times (24) - 8 \div 2$

$= 8 - 4$

$= 4$

Calculate.

1. $9 + 6 - 8$ _____

2. $16 \div 8 \times 4$ _____

3. $6 \times 4 - 2$ _____

4. $14 - 12 \div 3$ _____

5. $7.5 + 12.4 \div 4$ _____

6. $8 \times 6 \div 4$ _____

Calculate.

7. $(5 + 3) - 6$ _____

8. $11 - (8 \div 2)$ _____

9. $\frac{1}{4}$ of (8×3) _____

10. $\frac{1}{2}$ of (6×7) _____

11. $7 + \frac{1}{3}$ of 1.5 _____

12. $\frac{1}{5}$ of $(35 - 15)$ _____

13. $16 \div \left(\frac{1}{4} \text{ of } 8\right)$ _____

14. $12 \times \frac{1}{4}$ of 1.6 _____

Simplify.

15. $17 - (4.4 \div 2) + 8$ _____

16. $(7 \times 6) \div 3 \times 2$ _____

17. $14 \div 2 - 16 \div 4$ _____

18. $3.2 + 3 \times 6 \div 2$ _____

19. $7 \times \frac{1}{3}$ of $(8.1 + 6.9)$ _____

20. $11 - (7.6 + 7.4) \div 5$ _____

Insert >, =, or < to make each statement true.

21. $3 \times 5 - (7.2 + 4) \square (3 \times 5) - 7.2 + 4$

22. $5.2 + 7.8 \div 2 + 6 \square (5.2 + 7.8) \div 2 + 6$

23. $3 + 7 - 6 \div 3 \square (3 + 7) - (6 \div 3)$

24. $28 \div 4 \times (3 + 6) \square (28 \div 4) \times 3 + 6$

Insert one pair of brackets in each question to make the answer correct.

25. $3 \times 8 \div 2 \times 2 = 6$

26. $11.3 + 12 \div 2 \times 6 = 12.3$

27. $19 - 7 \times 3 \div 2 = 18$

28. $6 \times 7 \div 11.4 - 10.4 = 42$

29. $3 \times 9 + 6 \div 5 = 9$

Simplify.

30. $\frac{1}{3}$ of $12.6 + \frac{1}{2}$ of 8.92 _____

31. $12 - \frac{1}{6}$ of $2.4 \times \frac{1}{4}$ of 20 _____

32. Choose the number sentence that gives the answer to the problem, then calculate the answer.

Janine's class has 28 students. Five groups are formed with five students in each group. How many students, n, are not in any group?

_____

a) $28 \div (5 + 5) = n$ **b)** $5 \times 5 + 28 = n$

c) $28 - (5 + 5) = n$ **d)** $28 - (5 \times 5) = n$

Name _____

Test One CHAPTER 1: Number Connections

MATHPOWER™ *Seven*, pp. 1–45

Write the total value of each indicated digit.

1. 2$\underline{7}$5 421 _____
2. $\underline{7}$ 638 427 _____
3. 31$\underline{2}$.09 _____
4. 6.345$\underline{1}$ _____

Write each number in standard form.

5. $5 \times 10\,000 + 3 \times 1000 + 9 \times 100$

_____

6. $400 + 30 + 8 + 0.7 + 0.08 + 0.001$

_____

7. $10 + 2 + 0.3 + 0.01 + 0.001 + 0.0007$

_____

8. two thousand sixty-four and thirty-five thousandths

_____

9. one hundred seventy-two and ninety-seven hundredths

_____

Write each number in expanded form.

10. 1 286 309 _____

_____

_____

11. 47.2481 _____

_____

_____

Write each number in words.

12. 328.149 _____

_____

_____

13. 61.37 _____

_____

_____

Round each number to the indicated place.

14. 325 371 to the nearest 100 _____

15. 5 586 737 to the nearest 100 000

_____

16. 32.476 to the nearest one _____

17. 26.873 to the nearest tenth _____

18. 17.777 to the nearest hundredth

_____

19. 1.4655 to the nearest thousandth

_____

Calculate.

20.
$$\begin{array}{r} 724 \\ 37 \\ 922 \\ +\ 183 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 8274.36 \\ 6238.81 \\ +\ 381.42 \\ \hline \end{array}$$

22.
$$\begin{array}{r} 32\,408 \\ -\ 19\,372 \\ \hline \end{array}$$

23.
$$\begin{array}{r} 3400.32 \\ -\ 645.59 \\ \hline \end{array}$$

24.
$$\begin{array}{r} 4256 \\ \times\ 54 \\ \hline \end{array}$$

25.
$$\begin{array}{r} 43.2 \\ \times\ 0.83 \\ \hline \end{array}$$

26. $8\overline{)3186}$

27. $5\overline{)3.8}$

28. $0.46\overline{)29.578}$

29. $0.03\overline{)1.3578}$

Calculate.

30. 3.62×0.01 _____

31. $28.6 \div 10$ _____

32. $13 \div 0.1$ _____

33. 7.38×1000 _____

Simplify.

34. $\frac{1}{3}$ of $(90 \div 3) + 16 \div 4 + \frac{1}{2}$ of 10 _____

35. $6.3 \div 3 + (5 + 6) \times 4 - 3$ _____

36. A magazine's subscription price is $26.95 for 13 issues. The newsstand price is $2.75 per issue. How much is saved on 13 issues if the subscription price is paid?

_____

Name _____

Test Two CHAPTER 1: Number Connections

MATHPOWER™ *Seven*, pp. 1–45

Write the total value of each indicated digit.

1. 368 209 _____

2. 67.5342 _____

3. 1 329 736 _____

4. 531.893 _____

5. Write each number in standard form, then order the numbers from smallest to largest.

a) three hundred forty-eight thousand nine hundred twenty-two

_____

b) one hundred four and eighty-seven hundredths

_____

c) $30\,000 + 2000 + 400 + 70 + 1 + 0.4 + 0.07$

_____

d) $3 \times 100 + 5 \times 10 + 2 \times 1 + 7 \times 0.1 + 5 \times 0.01$

_____

e) three hundred thousand and one hundred sixty-four thousandths

_____

Ordered: _____

_____

Round the number 673 807.3865 to the indicated place value.

6. to the nearest one _____

7. to the nearest tenth _____

8. to the nearest ten _____

9. to the nearest hundredth _____

10. to the nearest ten thousand _____

11. to the nearest hundred _____

Write each number in words.

12. 0.743 _____

_____

13. 372.14 _____

_____

Write these numbers in words.

14. 35.746 _____

_____

15. 702.008 _____

_____

Calculate.

16.
$$\begin{array}{r} 3928 \\ 342 \\ 87 \\ +\ 907 \\ \hline \end{array}$$

17.
$$\begin{array}{r} 308.07 \\ 1935.63 \\ +\ 82.45 \\ \hline \end{array}$$

18.
$$\begin{array}{r} 4109.84 \\ -\ 231.76 \\ \hline \end{array}$$

19.
$$\begin{array}{r} 15\,000 \\ -\ 5\,389 \\ \hline \end{array}$$

20.
$$\begin{array}{r} 27.18 \\ \times\ 0.53 \\ \hline \end{array}$$

21.
$$\begin{array}{r} 673 \\ \times\ 27 \\ \hline \end{array}$$

Divide.

22. $8\overline{)6724}$

23. $6\overline{)7.92}$

24. $0.35\overline{)48.23}$

25. $4.7\overline{)2.303}$

Calculate.

26. $36.63 \times 0.01 + 756 \div 100$ _____

27. $8.35 \times 100 - 32.47 \div 0.1$ _____

28. $62.89 \times 1000 - 43.769 \div 0.01$

_____

Simplify.

29. $\frac{1}{4}$ of $(16 \times 3) + 25 \div 5 + \frac{1}{3}$ of 9

_____

30. Margot needed 11 pieces of string for her science experiment. She cut 7 pieces 68.5 cm long and 4 pieces 89.3 cm long. How much string did she use altogether?

_____

Name _____

Extension CHAPTER 1: Number Connections

MATHPOWER™ *Seven*, pp. 1–45

1. Write each number in standard form. Then, find the sum of the five numbers.

a) 400 + 70 + 3 + 0.1 + 0.08

_____

b) 3000 + 400 + 30 + 1 + 0.9 + 0.06 + 0.005

_____

c) 7000 + 200 + 80 + 2 + 0.3 + 0.07

_____

d) 500 + 80 + 3

_____

e) 800 + 60 + 3 + 0.5

_____

Sum: _____

2. Write each number in standard form. Then, find the difference between the two numbers.

a) $4 \times 100\,000 + 6 \times 10\,000 + 7 \times 1000 + 3 \times 100 + 2 \times 10 + 5 \times 1$

_____

b) $2 \times 100\,000 + 3 \times 10\,000 + 8 \times 1000 + 2 \times 100 + 1 \times 10 + 8 \times 1$

_____

Difference: _____

3. Write each number in standard form and find the difference between the two numbers.

a) nine thousand three hundred forty-eight and seventy-one hundredths

_____

b) four thousand eight hundred thirty-nine and fifty-seven hundredths

_____

Difference: _____

4. Round each number to the nearest hundredth. Then, find the product of the two numbers.

a) 562.837 _____ **b)** 83.062 _____

Product: _____

Circle the correct answer, a), b), or c), for each of the following.

5. 2470 ÷ 65 **a)** 380 **b)** 38 **c)** 3800

6. 4568 ÷ 64 **a)** 71.375 **b)** 713.75 **c)** 7.1375

7. 3680.568 ÷ 58.2 **a)** 632.4 **b)** 63.24 **c)** 6.324

Use your skills with powers of ten to calculate each of the following.

8. 4.98×500 _____

9. 5.64×0.06 _____

10. 234 ÷ 400 _____

11. 0.688 ÷ 20 _____

12. 1324×0.004 _____

13. 86.28×0.5 _____

Simplify.

14. $38.49 + 2.5 \times 2.5$ _____

_____

15. $1536 - 68.4 \div 2 + 475 \times 2$ _____

_____

16. $(35.89 + 76.29) \times 2.4 - 200.36$ _____

_____

Use the table to determine a value for each word.

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
0.3	1.6	0.5	0.8	1.1	0.7	0.2	0.09	0.4	1.4	0.1	0.6	1.2

17. your surname _____

18. your school's name _____

19. MATHPOWER _____

20. Canada _____

Name _____

2.1 Factors and Divisibility

MATHPOWER™ *Seven*, pp. 52–53

The **factors** of a number each divide the number evenly.

$48 \div 1 = 48$ $48 \div 2 = 24$ $48 \div 3 = 16$ $48 \div 4 = 12$ $48 \div 6 = 8$
$48 \div 48 = 1$ $48 \div 24 = 2$ $48 \div 16 = 3$ $48 \div 12 = 4$ $48 \div 8 = 6$

The factors of 48 are 1, 2, 3, 4, 6, 8, 12, 16, 24, and 48.
The divisibility rules can help you find the factors of a number.
A number is divisible by

2 if it ends in 0, 2, 4, 6, or 8.
3 if the sum of the digits is divisible by 3.
4 if the last two digits are divisible by 4.
5 if it ends in 0 or 5.
6 if it is divisible by 2 and 3.
8 if the last three digits are divisible by 8.
9 if the sum of the digits is divisible by 9.
10 if it ends in 0.

State the missing factor.

1. $5 \times \_\_\_\_ = 45$ **2.** $\_\_\_\_ \times 3 = 21$

3. $11 \times \_\_\_\_ = 77$ **4.** $\_\_\_\_ \times 6 = 54$

5. $\_\_\_\_ \times 7 = 49$ **6.** $2 \times \_\_\_\_ = 16$

7. $\_\_\_\_ \times 4 = 28$ **8.** $9 \times \_\_\_\_ = 36$

Write two pairs of factors for each number.

9. $\_\_ \times \_\_ = 24$; $\_\_ \times \_\_ = 24$

10. $\_\_ \times \_\_ = 26$; $\_\_ \times \_\_ = 26$

11. $\_\_ \times \_\_ = 48$; $\_\_ \times \_\_ = 48$

12. $\_\_ \times \_\_ = 80$; $\_\_ \times \_\_ = 80$

13. $\_\_ \times \_\_ = 108$; $\_\_ \times \_\_ = 108$

Complete each list of factors.

14. 32: 1, 2, __ , 8, __ , 32

15. 65: 1, __ , 13, __

16. 80: __ , 2, __ , 5, __ , 10, __ , 20, __ , 80

17. 72: __ , __ , 3, 4, __ , __ , 9, 12, 18, __ , __ , 72

List all the factors of each number.

18. 52 _____

19. 36 _____

20. 57 _____

21. 63 _____

22. 96 _____

23. In questions 18–22, which numbers

a) are divisible by 2? _____

b) are divisible by 3? _____

c) are divisible by 2 and 3? _____

State the missing factors. Use factors greater than 1.

24. $2 \times \_\_\_\_ \times \_\_\_\_ = 180$

25. $\_\_\_\_ \times \_\_\_\_ \times \_\_\_\_ = 300$

26. $\_\_\_\_ \times 4 \times \_\_\_\_ = 240$

27. $8 \times \_\_\_\_ \times \_\_\_\_ = 192$

28. $\_\_\_\_ \times \_\_\_\_ \times 2 = 168$

29. $\_\_\_\_ \times 9 \times \_\_\_\_ = 225$

30. $\_\_\_\_ \times \_\_\_\_ \times \_\_\_\_ = 212$

Find the smallest number whose factors are

31. 3, 4, and 5. _____

32. 2, 4, and 9. _____

33. 11, 4, and 2. _____

34. 10, 2, and 6. _____

Use the divisibility rules to determine which of the following numbers are divisible by 8 and which are divisible by 9.

35. 729 _____ **36.** 1520 _____

37. 14 112 _____

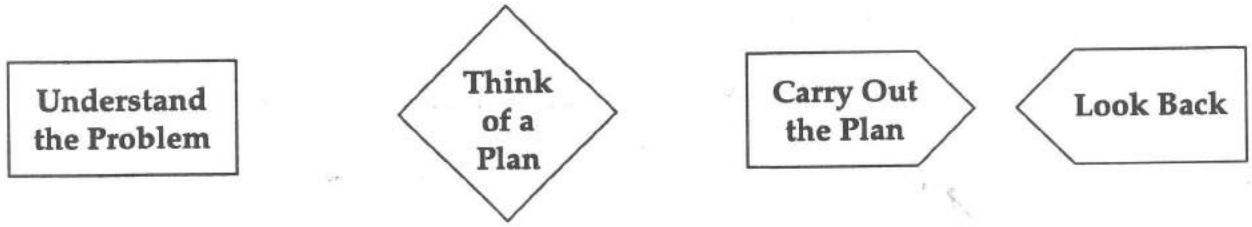
38. There are 24 desks in the classroom. In how many ways can the desks be arranged in equal groups?

_____

Name _____

2.2 Problem Solving: Work Backward

MATHPOWER™ *Seven*, pp. 54–55



1. Domenic started with a number. He added 9, multiplied by 2, and subtracted 6. The result was 112. What was the number?

_____

2. Natalie chose a number. She multiplied by 9, added 35, then divided by 5. The result was 34. What was Natalie's number?

_____

3. An elevator started from the first floor. On the fourth floor, 3 people got off and 4 got on. On the seventh floor, 2 people got off and 3 got on. The elevator then went back to the first floor, where the remaining 6 people got off. How many people were on the elevator when it started from the first floor?

_____

4. Aldo asked his grandmother in what year she was born. His grandmother told him that if he divided the year by 2 and subtracted the square of 8, the result would be 900. In what year was John's grandmother born?

_____

5. Nicole received her allowance before she went to the movies. She spent $1.80 on bus fare, $5.00 for admission, and $2.30 for snacks. The next day she paid half of what she had left on lunch with her friends. She then had $5.45 left. How much is Nicole's allowance?

_____

6. Steven made a down payment on a new stereo and then paid the remainder at $65.00 each month for 12 months. His total payments were $900.00. How much was the down payment?

_____

7. The Flanagan family are going on vacation. Their airplane leaves at 16:30, the drive to the airport takes 25 min, and they want to check in 1 h before their departure time. At what time should they leave home?

_____

Name _____

2.3 Prime and Composite Numbers
2.4 Prime Factors

MATHPOWER™ *Seven*, pp. 56–59

A **prime number** has exactly two factors, itself and 1.
The factors of 17 are 1 and 17. So, 17 is a prime number.

A **composite number** has more than two factors.
The factors of 8 are 1, 2, 4, and 8. So, 8 is a composite number.

Write all the factors for each of the following.

1. 6 _____ **2.** 3 _____

3. 14 _____ **4.** 13 _____

5. 29 _____ **6.** 21 _____

7. 37 _____ **8.** 61 _____

9. 51 _____ **10.** 73 _____

11. 45 _____ **12.** 63 _____

13. Which of the above numbers are composite?

_____

Write all the factors for each number. Circle the factors that are prime.

14. 36 _____

15. 12 _____

16. 60 _____

17. 48 _____

18. 85 _____

Write each number as the product of two prime factors.

19. 35 = ___ × ___ **20.** 57 = ___ × ___

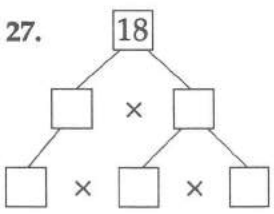
21. 134 = ___ × ___ **22.** 95 = ___ × ___

23. 34 = ___ × ___ **24.** 161 = ___ × ___

25. 55 = ___ × ___ **26.** 115 = ___ × ___

Complete each factor tree.

27.



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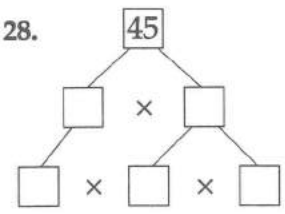
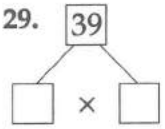


Complete these factor trees.

29.



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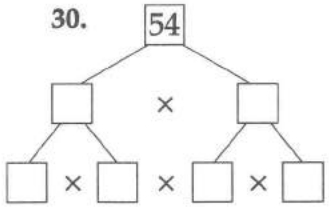

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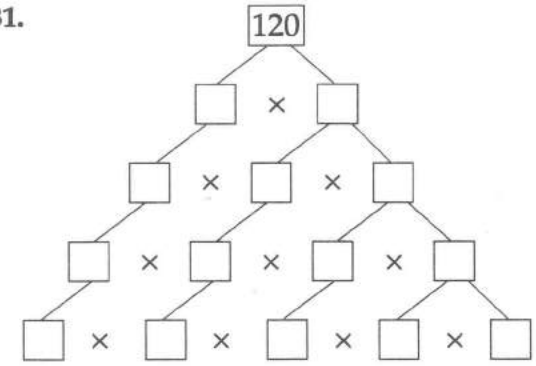


32. One factor of a number is 21. State two other factors of the number.

_____

33. A number's prime factors are 2, 3, and 7. State three other factors of the number.

_____

34. The prime factors of a number are 5, 7, and 13. State three other factors of the number.

_____

35. Write five pairs of prime numbers with a sum of 48.

_____ _____ _____

_____ _____

Name _____

2.5 Problem Solving: Draw a Diagram or Flow Chart

MATHPOWER™ *Seven*, pp. 60–61

1. Number the instructions in the correct order to make a decorative cover for a workbook.

_____ Centre the workbook on the rectangle.

_____ Fold a triangle in at each corner of both covers.

_____ Open the workbook and measure its length and width.

_____ Fold in the sides on the workbook covers.

_____ Close the workbook and write your name on the front of it.

_____ Add 3 cm to each dimension.

_____ Fold in the top and the bottom on each book cover.

_____ Cut a rectangle out of wallpaper to match the calculated dimensions.

_____ Cut a slit above and below the spine of the workbook.

2. Ken enclosed his yard, using preconstructed sections of fence. A post was needed for the end of a section or where 2 sections joined. Ken used 6 sections on each side of his yard and 10 across the back of the yard. How many posts did he need?

_____

3. A number of counters are arranged in rows so that there are 5 counters in each row and 22 counters around the outside. How many counters are there altogether?

_____

4. Draw a flow chart to represent the following instructions.

Write a 2-digit number.

Reverse the digits.

Multiply by 4. Then, subtract 25 to give the final answer.

Use your flow chart from question 4 to find the answer for each of these numbers.

5. 27 _____ **6.** 58 _____

7. 45 _____ **8.** 93 _____

9. Alicia hammered nails into a board to make a circular pegboard. The nails were the same distance apart, and the 6th nail was directly opposite the 18th nail. How many nails formed the circle?

_____

10. A rectangle is divided into 2 equal areas with a vertical line. The 2 diagonals of the rectangle are then drawn. Finally, 2 other vertical lines are added. Into how many sections has the rectangle been divided?

_____

Name _____

2.6 Greatest Common Factor
2.7 Lowest Common Multiple

MATHPOWER™ *Seven*, pp. 64–67

The largest factor that two or more numbers have in common is called the **greatest common factor** (GCF) .

12: 1, 2, 3, 4, [6], 12

30: 1, 2, 3, 5, [6], 10, 15, 30

The GCF of 12 and 30 is 6.

The **lowest common multiple** (LCM) of a set of numbers is the smallest number that is a multiple of each number in the set.

4: 4, 8, [12], 16, 20, 24, 28, . . .

6: 6, [12], 18, 24, 30, 36, . . .

The LCM of 4 and 6 is 12.

---

1. Write all the factors for each number, then state the GCF for each set of numbers.

a) 20 _____

48 _____

60 _____

GCF: _____

b) 32 _____

40 _____

56 _____

GCF: _____

List all the common factors for each pair of numbers. Then, circle the GCF.

2. 8, 24 _____

3. 36, 24 _____

4. 11, 77 _____

Write the GCF for each set of numbers.

5. 26, 39, 65, 78 _____

6. 14, 22, 28, 70 _____

7. Three groups contain 184, 232, and 272 people. Each group is to be divided into teams so that all teams contain the same number of people and every person is on a team. What is the largest number less than 10 that can be on a team?

_____

8. Write the first 10 multiples for each number, then state the LCM for each pair of numbers.

a) 2 _____

3 _____

LCM: _____

b) 8 _____

6 _____

LCM: _____

c) 4 _____

10 _____

LCM: _____

Write the LCM for each pair of numbers.

9. 6, 7 _____ **10.** 3, 7 _____

11. 15, 5 _____ **12.** 6, 11 _____

Find the LCM for each pair of prime numbers.

13. 5, 7 _____ **14.** 17, 5 _____

15. 13, 3 _____ **16.** 3, 23 _____

Write the LCM for the following.

17. 2, 4, 5 _____ **18.** 2, 5, 8 _____

19. 7, 3, 8 _____ **20.** 12, 3, 10 _____

21. In music class, the students were asked to clap their hands on every third beat and stamp their feet on every fifth beat. On which beat did they first have to do both?

_____

Name _____

2.8 Exponents

MATHPOWER™ *Seven*, pp. 68–69

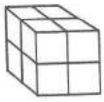
$3^4 = 3 \times 3 \times 3 \times 3 = 81$

exponential form — repeated multiplication — standard form

power → 3^4 ← exponent

base

2 squared is represented in the diagram. It is written 2^2 and equals 2×2 or 4.



2 cubed is represented in the diagram. It is written 2^3 and equals $2 \times 2 \times 2$ or 8.

Complete the following.

1. $\square^2 = 8 \times 8$ The base is _____.
2. $3^{\square} = 3 \times 3 \times 3$ The exponent is _____.
3. $\square = 4 \times 4 \times 4$ The power is _____.
4. $2^{\square} = 2 \times 2 \times 2 \times 2$ The exponent is _____.
5. $\square^3 = 7 \times 7 \times 7$ The base is _____.

Write as repeated multiplication and evaluate.

6. 10^2 _____
7. 4^3 _____
8. 2^4 _____
9. 7^2 _____
10. 3^5 _____
11. 6^2 _____
12. 3^3 _____
13. 5^4 _____

Write in exponential form.

14. $3 \times 3 \times 3 \times 3 \times 3$ _____
15. $8 \times 8 \times 8$ _____
16. $7 \times 7 \times 7 \times 7 \times 7$ _____
17. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ _____
18. $5 \times 5 \times 5 \times 5$ _____

Write as a power of 10.

19. 10 000 _____
20. 100 _____
21. 10 000 000 _____
22. 100 000 _____

Evaluate.

23. 5 cubed _____
24. 4 squared _____
25. 9 squared _____
26. 8 cubed _____

Evaluate.

27. 6 cubed _____
28. 7 cubed _____
29. 3 squared _____
30. 10 squared _____

Write in standard form.

31. 4^4 _____
32. 2^3 _____
33. 2^5 _____
34. 1^5 _____
35. 10^5 _____
36. 4^5 _____
37. 12^2 _____
38. 5^2 _____
39. 8^2 _____

Complete the table.

	Power	Base	Exponent	Standard Form
40.	10^3			
41.		5		3125
42.		4	3	
43.	7^4			
44.			3	216
45.		2		64

Write the powers in order from smallest to largest.

46. $8^2, 3^5, 2^7, 5^4$ _____
47. $7^4, 4^5, 12^2, 9^3$ _____

Evaluate.

48. 1.2^2 _____
49. 3.2^3 _____
50. 2.5^3 _____
51. 4.1^2 _____

52. The number 49 is said to be square because $7^2 = 49$. Circle the following numbers that are square.

a) 81 b) 225 c) 1088
d) 144 e) 56 f) 324

Name _____

2.10 More About Order of Operations

MATHPOWER™ *Seven*, pp. 72–73

The letters BEDMAS can help you to recall the correct order of the steps in the order of operations.

B	E	DM	AS
Brackets	Exponents and "of"	Divide and multiply in order, from left to right.	Add and subtract in order, from left to right.

Evaluate.

1. $(3 + 4)^3$ _____
2. $(7 + 2)^2$ _____
3. $(8 - 5)^3$ _____
4. $(6 - 3)^4$ _____
5. $(11 - 6)^3$ _____
6. $(9 - 8)^5$ _____

Evaluate.

7. $3^2 + 9 \div 3$

_____

8. $2^4 - 6 + 11$

_____

9. $8^2 \times 2 - 12$

_____

10. $16 \div 4 + 3^4$

_____

11. $2^3 + 4^2 - 7 \times 2$

_____

12. $9^2 + 8^2 \div 4 \times 2$

_____

13. $33 - 2^4 + 6^2$

_____

14. $60 \div 10 + 2^5 - 3$

_____

Calculate.

15. $6^3 - 2^4$

_____

16. $7^2 + 3^3$

_____

17. $9^2 + 11^2$

_____

18. $10^2 + 1^5$

_____

19. $8^2 - 5^2$

_____

20. $3^4 - 2^3$

_____

21. $12^2 + 3^3$

_____

22. $7^3 - 7^2$

_____

Calculate.

23. $3 \times (5 - 2)^3$

_____

24. $6 \times (4 + 1)^2$

_____

25. $5 \times (9 \div 3)^4$

_____

26. $10 \times (3 \times 4)^2$

_____

Insert >, <, or = to make each statement true.

27. $3^3 \square 4^2$
28. $4^2 \square 2^4$
29. $(1 + 4)^2 \square (5 - 3)^3$
30. $(7 - 4)^3 \square (8 + 7)^2$
31. $3 + 4^2 \square (3 + 4)^2$
32. $(9 + 6)^2 \square 9^2 + 6^2$

Simplify.

33. $9^2 + (3 + 1)^3 - (4 + 3)^2$

_____

34. $8^2 \div 2^4 \times 3 \times (8 - 5)^2$

_____

35. $(799 + 1^7) \div (10 + 10)^2 + 10^2$

_____

36. $8^2 + 6^2 + 9^2 - 4^2 \times 2^3$

_____

37. **a)** In a magic square, the sum of each row, column, and diagonal is the same. Complete the magic square.

$2^3 - 1$		$2^2 + 1$
$3^2 - 7$	$2^4 \div 2^2$	
		$(8 - 7)^6$

b) What is the magic number? _____

Name _____

2.11 Problem Solving: Solve a Simpler Problem

MATHPOWER™ *Seven*, pp. 74 – 75

Understand the Problem → **Think of a Plan** → **Carry Out the Plan** → **Look Back**

Break the problem into smaller, simpler problems. Then solve.

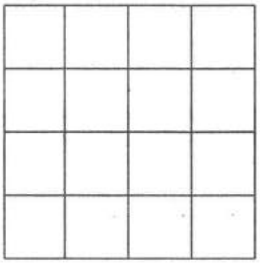
1. Find the sum.

$13 + 23 + 33 + 43 + \ldots + 153$

2. Find the sum.

$20 + 40 + 60 + 80 + \ldots + 300$

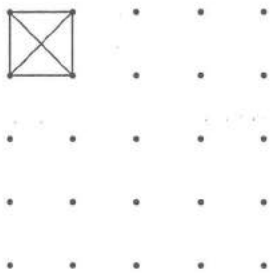
3. How many squares can be found in the diagram?



4. Mina covers 60 cm with one step. How many steps would she take to walk 30 km?

5. The soccer tournament has 12 teams participating. Each team plays every other team twice at home and twice away during the season. How many games are played altogether?

6. How many elastics are needed to join the pegs on the geoboard so that the following pattern can be seen between each set of 4 pegs? Assume that each elastic joins only 2 pegs.



7. In a 400-page book, how many times is the digit 4 used in the page numbers?

8. How many different line segments can be named in the following diagram?

9. Fifteen points are arranged in a circle. How many lines are needed to join every point to every other point once?

Name _____

Test One CHAPTER 2: Number Theory

MATHPOWER™ *Seven*, pp. 47–79

List all the factors for each of the following.

1. 28 _____

2. 60 _____

3. 25 _____

4. 48 _____

5. Circle the composite numbers.

15 7 13 21 53 51 24

Draw a factor tree for each number.

6. 18

7. 30

8. 108

9. 105

List the common factors for the following.

10. 14 and 56

11. 22 and 88

Find the greatest common factor.

12. 24, 96

13. 18, 36

14. 35, 63, 84

15. 56, 70, 42

Find the lowest common multiple.

16. 8, 12

17. 3, 5

18. 3, 7, 14

19. 5, 10, 12

Write as a power of 10.

20. 1000

21. 1 000 000

22. 10 000

23. 100 000

Express as repeated multiplication and evaluate.

24. 11^2 _____

25. 6^3 _____

26. 2^5 _____

27. 10^4 _____

28. 3^4 _____

29. 5^3 _____

Write in exponential form.

30. 16 _____

31. 125 _____

32. 144 _____

33. 81 _____

Evaluate.

34. $4 \times 9 \div (5 - 3)^2$ _____

35. $(3 \times 4)^2 + 55 \div 11$ _____

36. $11^2 - 7 \times 3 + 26 \div 2$ _____

37. $100 \div (3^2 + 4^2)$ _____

38. A number is multiplied by 4, then divided by 2, and then increased by 34. Draw a flow chart and use it to find the answer for each number.

a) 13 _____ **b)** 28 _____ **c)** 59 _____

Name _____

Test Two CHAPTER 2: Number Theory

MATHPOWER™ *Seven*, pp. 47–79

1. List all the factors for each number. Then, circle the common factors for each pair of numbers.

a) 48 _____

128 _____

b) 184 _____

176 _____

c) 325 _____

500 _____

List the prime factors for each of the following numbers.

2. 62 _____ **3.** 118 _____

_____ _____

4. 250 _____ **5.** 324 _____

_____ _____

Find the greatest common factor for each set of numbers.

6. 26, 78, 91 _____

7. 165, 275 _____

8. 75, 125, 175 _____

Find the lowest common multiple for each set of numbers.

9. 16, 24 _____

10. 4, 20, 15 _____

11. 3, 7, 9 _____

Write as repeated multiplication and evaluate.

12. 4^3 _____ **13.** 9^3 _____

_____ _____

14. 2^4 _____ **15.** 12^2 _____

_____ _____

Write using powers of 10.

16. 70 000 **17.** 200 000

_____ _____

18. 16 000 000 **19.** 9000

_____ _____

Evaluate.

20. $4^3 \times 2^2 \times 3$ **21.** $5^2 \times 3^3 \times 2$

_____ _____

22. $2^5 \times 3^3 \times 9$ **23.** $12^2 \times 6 \times 4^2$

_____ _____

24. $(7 \times 4 - 8)^2$

_____

25. $4^2 + (16 - 8) \div 4$

_____

26. $16 \div 2 \times 8^2 + 6 \times 7$

_____

27. $4^3 + 14 \times (7 - 5)^3$

_____

28. Every tenth day the students have a completion day for activities in English class. Every twelfth day they have a games day in math. What is the first day that they have both on the same day?

_____

29. In a square three lines are drawn vertically to divide the square into four equal pieces, then the two diagonals of the square are added. Into how many sections has the square been divided?

_____

30. The digits in a 2-digit number are reversed. The 2 numbers are multiplied, and then the product is subtracted from 10 000. Draw a flow chart and use it to find the answer for each number.

a) 83 _____ **b)** 21 _____ **c)** 45 _____

Name _____

Extension CHAPTER 2: Number Theory

MATHPOWER™ *Seven*, pp. 47–79

1. Write each number in standard form. Then, find the sum of the four numbers.

a) $7 \times 10^4 + 3 \times 10^2 + 8 \times 10 + 5 \times 1$

_____

b) $3 \times 10^5 + 4 \times 10^4 + 2 \times 10^3 + 6 \times 10^2 + 3 \times 10 + 9 \times 1$

_____

c) $5 \times 10^3 + 1 \times 1$

_____

d) $6 \times 10^4 + 2 \times 10^3 + 7 \times 10^2 + 8 \times 10$

_____

Sum: _____

2. The prime factors of a number are 2, 5, and 7. Write the number and state three other factors of the number.

_____

3. Write each number in standard form and find the difference between the 2 numbers.

a) $6 \times 10^4 + 1 \times 10^2 + 3 \times 1$

_____

b) $5 \times 10^3 + 9 \times 10^2 + 8 \times 10 + 3 \times 1$

_____

Difference: _____

Express each number as a product of three factors greater than 1.

4. 165 = _____ × _____ × _____

5. 324 = _____ × _____ × _____

6. 504 = _____ × _____ × _____

7. 256 = _____ × _____ × _____

8. 496 = _____ × _____ × _____

Find the smallest number whose factors are the following.

9. 3, 5, 6 _____ **10.** 3, 7, 6 _____

11. 7, 21, 9 _____ **12.** 8, 3, 6 _____

13. 8, 10, 16 _____ **14.** 15, 10, 6 _____

Find the greatest common factor for the following sets of numbers.

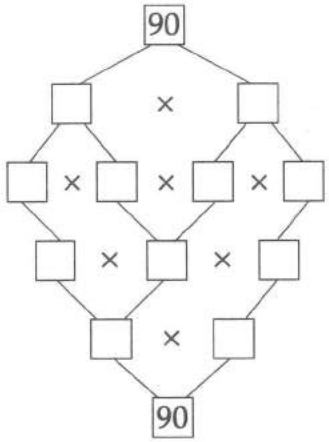
15. 28, 63, 91, 119, 147 _____

16. 63, 108, 144, 198, 225 _____

17. The prime factors of a number are 3, 5, and 17. Write the number and state three other factors of the number.

_____

18. Complete the double factor tree.



Mr. Gomez is making up bags of mixed marbles to sell in his store. He has 32 red marbles, 48 blue marbles, and 128 green marbles. He wants to put the same number of each colour in each bag.

19. What is the largest number of bags he can make up?

_____

20. How many of each colour of marbles will be in each bag?

_____

Name _____

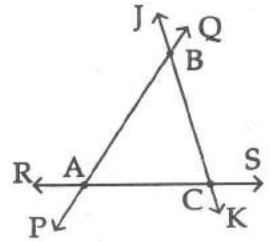
3.1 The Language of Geometry

MATHPOWER™ *Seven*, pp. 86–87

The table lists the 5 most common geometric terms.

Point A	A
Line AB	$\overleftrightarrow{AB}$
Ray AB	$\overrightarrow{AB}$
Line Segment	$\overline{AB}$ or AB
Angle ABC	$\angle ABC$

In the diagram below, name the following.



1. 3 points _____
2. 3 lines _____
3. 3 rays _____
4. 3 angles _____
5. 2 line segments that intersect at point B _____
6. 2 rays that intersect at point C _____

Write the name and symbol for each figure.

7.

_____

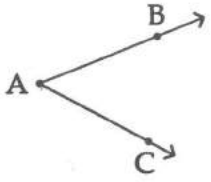
8.

_____

9.

_____

10.



_____

Draw each of the following.

11. angle DEF

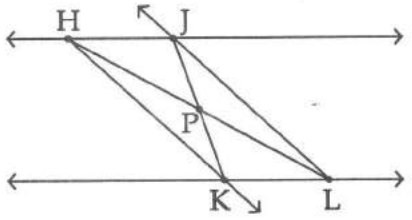
12. ray AB

Draw the following.

13. point M

14. line segment XZ

Use the diagram below to name the following.



15. 5 points _____
16. 3 rays _____
17. 4 angles with vertex P _____
18. 2 line segments that intersect at point P _____

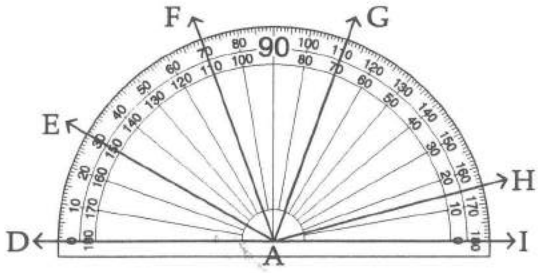
19. Use the instructions to draw a diagram.
a) Draw point C.
b) Through C, draw ray CD.
c) Through D, draw ray DE.
d) Through C and E, draw ray CE.
e) On line segment CD, mark point A.
f) Draw line segment EA.
g) Describe the diagram in your own words.

Name _____

3.2 Angles

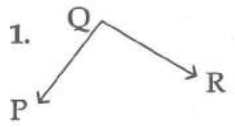
MATHPOWER™ *Seven*, pp. 88–89

Angles are measured with a **protractor**.
The inner scale is read from right to left.
The outer scale is read from left to right.



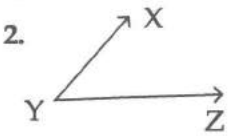
Name each angle in two ways.

1.



_____

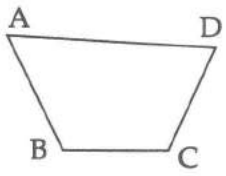
2.



_____

Name the angles in each diagram.

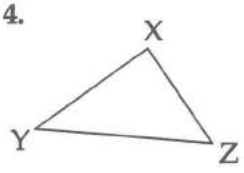
3.



_____

_____

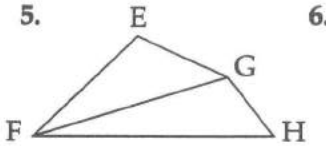
4.



_____

_____

5.

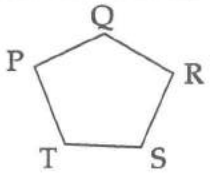


_____

_____

_____

6.

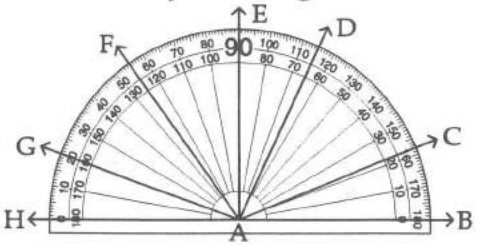


_____

_____

_____

Write the measure for each angle.



7. ∠GAH _____ **8.** ∠BAF _____

9. ∠GAB _____ **10.** ∠EAH _____

11. ∠DAH _____ **12.** ∠BAH _____

13. ∠BAD _____ **14.** ∠CAH _____

With your protractor, draw angles with the following measures. Label and name each angle.

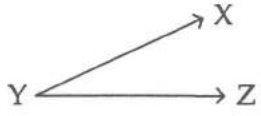
15. 45° **16.** 58°

17. 105° **18.** 31°

19. 130° **20.** 75°

Estimate the measure of each angle. Then, use a protractor to measure each angle.

21.



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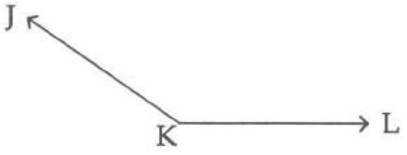
22.



_____

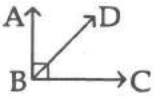
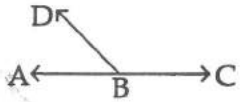
Name _____

3.3 Classifying Angles

MATHPOWER™ *Seven*, pp. 90–91

Angles are named according to their size.

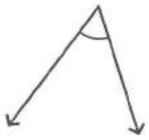
Angle Name	Angle Size
Acute	less than 90°
Right	90°
Obtuse	between 90° and 180°
Straight	180°
Reflex	between 180° and 360°

Complementary angles add to 90°.	Supplementary angles add to 180°.
	
∠ABD + ∠DBC = 90°	∠ABD +∠DBC = 180°

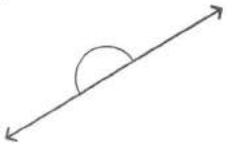
Classify the following angles as acute, right, obtuse, straight, or reflex.

1. 

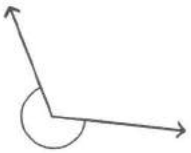
_____

2. 

_____

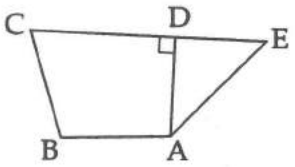
3. 

_____

4. 

_____

Classify each angle according to size.



5. ∠AED _____
6. ∠EDC _____
7. ∠BCE _____
8. ∠ABC _____
9. ∠ADC _____
10. ∠BAE _____
11. ∠ADE _____
12. ∠DCB _____

Classify each angle as acute, right, obtuse, straight, or reflex.

13. 46° _____
14. 130° _____
15. 93° _____
16. 59° _____
17. 173° _____
18. 315° _____

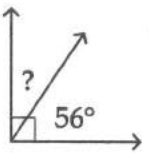
What is the measure of the complementary angle?

19. 42° _____
20. 78° _____
21. 32° _____
22. 72° _____
23. 40° _____
24. 14° _____

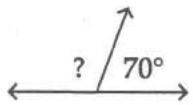
What is the measure of the supplementary angle?

25. 36° _____
26. 124° _____
27. 85° _____
28. 84° _____
29. 153° _____
30. 176° _____

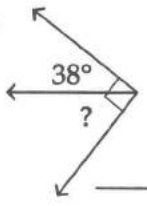
Determine the missing angle measures.

31. 

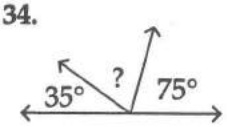
_____

32. 

_____

33. 

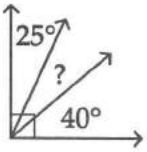
_____

34. 

_____

35. 

_____

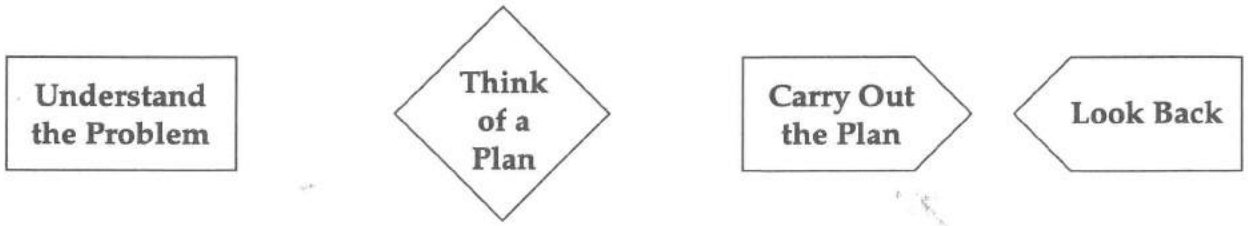
36. 

_____

Name _____

3.4 Problem Solving: Sequence the Operations

MATHPOWER™ *Seven*, pp. 92–93



1. Marianne took $100.00 to a store that was holding a no-tax sale. She bought a shirt for $24.99, sandals for $18.50, shorts for $16.49, and a beach bag for $21.69. How much did she have left after her shopping trip?

2. Lockers in a school are numbered from 1 to 325. All but the junior kindergartens are assigned a locker. Thirty-eight of the 398 students are in junior kindergarten. How many students have to share a locker?

3. Jeremiah earned $95.00 a week for 13 weeks' work at a drama camp. He was paid $50.00 each Friday. He received a cheque for the rest of the money at the end of the summer. What was the amount of the cheque?

4. There are 28 textbooks on the classroom shelf. Each book is 3.2 cm wide, and there is a space of 8.5 cm left. How long is the shelf?

5. The student council sold jars of mixed nuts at their bazaar. They were given 40 empty jars. They paid $19.60 for the nuts and $11.20 for decorative ribbon. They made a profit of 98¢ on each of the 40 jars sold. How much did they charge for each jar?

6. Sarah took 4 rolls of film on her summer vacation and Sandip took 6 rolls of film on his vacation. Sarah paid $12.35 to have each roll developed. Sandip went to a discount store and paid only $9.20 for each roll. Who paid more for film processing? What was the difference?

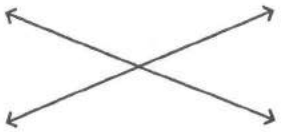
7. Brenda writes a daily journal. She writes about 9 words on each line and each page of her book has 24 lines. The book has 160 pages. About how many words will Brenda write if she fills the book?

8. Mr. Vowles drove 3016 km on a business trip. He drove 190 km from Montreal to Ottawa. Then, he drove 1508 km from Ottawa to Halifax. How far did he drive from Halifax to return to Montreal?

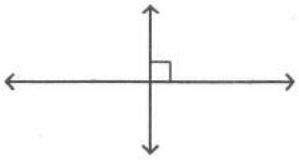
Name _____

3.5 Lines: Intersecting, Perpendicular, and Parallel

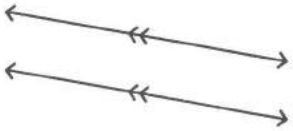
MATHPOWER™ *Seven*, pp. 94–95



Intersecting lines
cross each other.

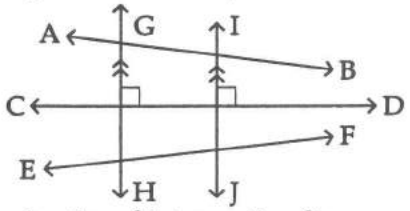


Perpendicular lines
intersect at right angles.



Parallel lines
never intersect.

Use the diagram to answer questions 1–4.



1. Name 4 pairs of intersecting lines.

_____

2. Name 1 pair of parallel lines.

_____

3. Name 2 pairs of perpendicular lines.

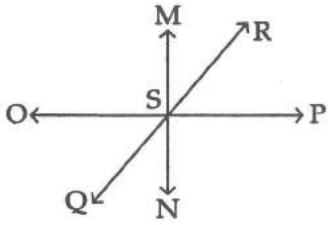
_____

4. Is AB parallel to EF? Explain.

_____

_____

Use the diagram to answer questions 5–8.



5. Measure each of the following angles.

∠MSO	∠RSP	∠RSN	∠MSR
_____	_____	_____	_____

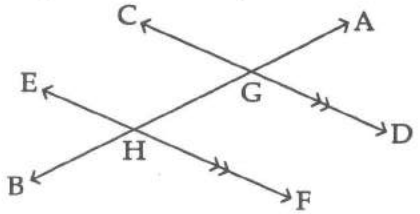
6. State the measure of each angle.

∠PSN	∠OSQ	∠MSQ	∠QSN
_____	_____	_____	_____

7. What is the measure of ∠MSP? _____

8. Name the angle that is equal and opposite to ∠MSP. _____

Use the diagram to answer questions 9–13.



9. Measure these angles.

∠AGD	∠DGH	∠BHE	∠CGA
_____	_____	_____	_____

10. Write the measure of these angles.

∠FHG	∠BHF	∠CGH	∠EHG
_____	_____	_____	_____

11. Name 4 pairs of angles whose measures add to 180°. _____

_____

12. Name 2 pairs of angles that are equal and opposite.

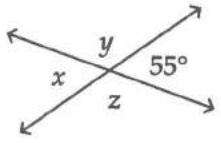
_____

13. Name 2 pairs of angles that are equal but not opposite.

_____

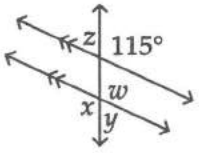
Determine the unknown angle measures.

14.



∠x _____
∠y _____
∠z _____

15.



∠w _____
∠x _____
∠y _____
∠z _____

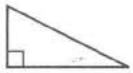
Name _____

3.6 Classifying Triangles

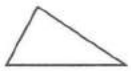
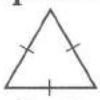
MATHPOWER™ *Seven*, pp. 98–99

Triangles are classified by angle measure or by the lengths of their sides.

Triangle Classification by Angles

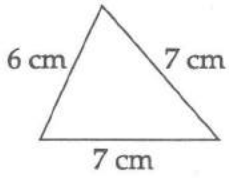
Acute	**Right**	**Obtuse**
		
all angles acute	one right angle	one obtuse angle

Triangle Classification by Sides

Scalene	**Isosceles**	**Equilateral**
		
no sides equal	two sides equal	all sides equal

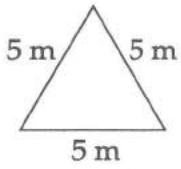
Classify each triangle as scalene, isosceles, or equilateral.

1.



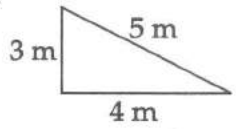
_____

2.



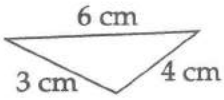
_____

3.



_____

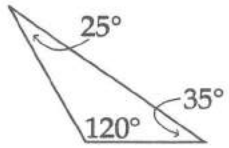
4.



_____

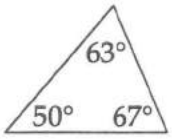
Classify each triangle as acute, right, or obtuse.

5.



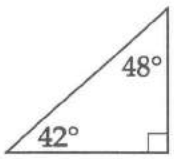
_____

6.



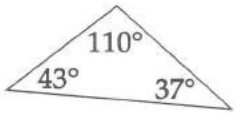
_____

7.



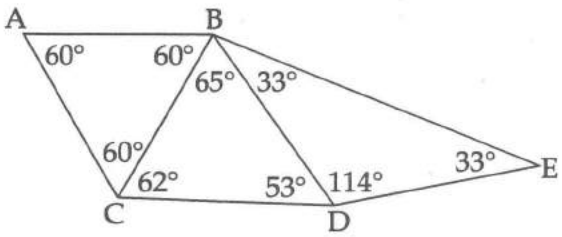
_____

8.



_____

Use the diagram to answer questions 9 and 10.



9. Name each of the 3 triangles.

_____ _____

_____

10. Classify each triangle by sides and by angles.

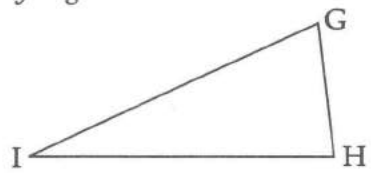
_____

_____

_____

Use measurement to classify each triangle by sides and by angles.

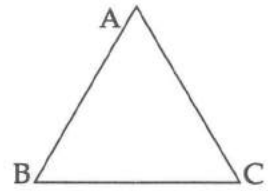
11.



_____

_____

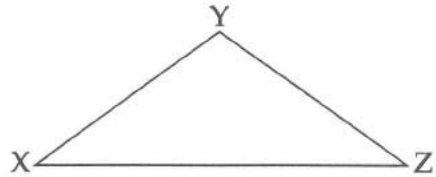
12.



_____

_____

13.



_____

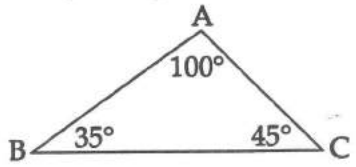
_____

Name _____

3.7 The Sum of the Interior Angles in a Triangle

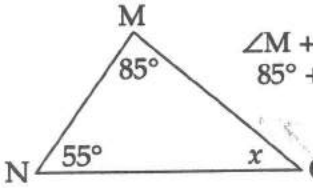
MATHPOWER™ *Seven*, pp. 100∠101

The sum of the interior angles of any triangle is 180°.



$\angle A + \angle B + \angle C = 180°$

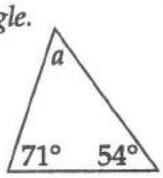
If the measures of 2 angles of a triangle are known, the third angle can be calculated.



$\angle M + \angle N + \angle O = 180°$
$85° + 55° + \angle O = 180°$
$140° + \angle O = 180°$
$\angle O = 40°$

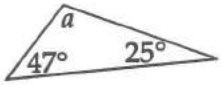
Determine the missing angle measure in each triangle.

1.



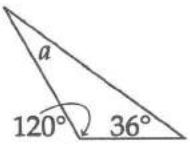
$\angle a$ _____

2.



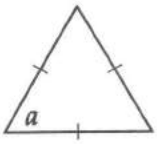
$\angle a$ _____

3.



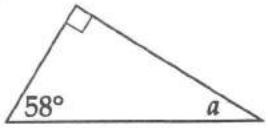
$\angle a$ _____

4.



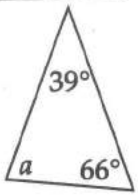
$\angle a$ _____

5.



$\angle a$ _____

6.



$\angle a$ _____

7. Each of the equal angles in an isosceles triangle measures 36°. What is the measure of the third angle?

_____

8. What is the sum of the other two angles in a right-angled triangle?

_____

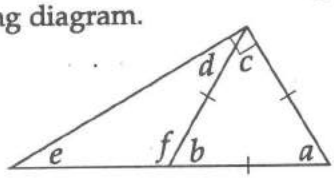
9. Explain why each of the angles of an equilateral triangle measures 60°.

_____

_____

_____

10. Use your knowledge of triangles to calculate the measure of each angle in the following diagram.

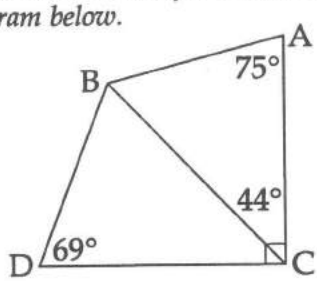


$\angle a$ _____ $\angle b$ _____

$\angle c$ _____ $\angle d$ _____

$\angle e$ _____ $\angle f$ _____

Calculate the measure of the unknown angles in the diagram below.



11. $\angle$ ABC_____ **12.** $\angle$ BCD _____

13. $\angle$ CBD_____ **14.** $\angle$ ABD _____

15. Use the angle measures in questions 11–14 to show the sum of the angles of a quadrilateral.

_____

_____

_____

Name _____

3.8 Problem Solving: Use a Table

MATHPOWER™ *Seven*, pp. 102–103

Understand the Problem → **Think of a Plan** → **Carry Out the Plan** → **Look Back**

The following table shows the cost of decorative pins that were available during Canada's 125th birthday celebrations. Use the table to answer questions 1–3.

Number Purchased	Cost per Pin
1–20	95¢
21–50	85¢
51–100	70¢
101–201	65¢
over 201	45¢

1. What was the cost of the following numbers of pins?

a) 4 _____ **b)** 25 _____ **c)** 60 _____

d) 120 _____ **e)** 201 _____ **f)** 250 _____

2. What is the difference between the cost of 99 pins and the cost of 101 pins?

_____

3. A school purchased 400 pins. How much did the school pay?

_____

4. A bakery sells rolls for 18¢ each. Complete the table to show the amounts charged.

Number of Rolls Sold	1	2	3	4	5	6	7
Cost of Rolls	18¢	36¢					

5. Use the table in question 4 to help calculate the cost of the following numbers of rolls in dollars.

a) 18 _____ **b)** 24 _____ **c)** 30 _____

The results of a survey listed the percent of Canadians who participated in fitness activities. Use the table to answer questions 6–9.

Activity	Percent of the Population
Walking	57%
Bicycling	38%
Swimming	36%
Jogging/Running	31%
Gardening	30%
Home Exercises	28%
Ice Skating	21%
Cross-Country Skiing	18%
Tennis	15%
Golf	13%

6. Which activity had almost 3 times as many participants as golf?

_____

7. Walking was about twice as popular as which activity?

_____

8. Cross-country skiing was exactly half as popular as which activity?

_____

9. Write 3 questions about the fitness information. Ask a classmate to answer your questions.

_____

_____

_____

_____

_____

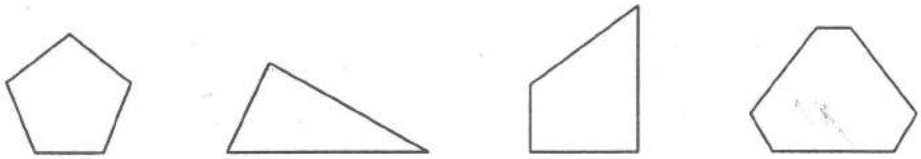
Name _____

3.9 Polygons

MATHPOWER™ *Seven*, pp. 104–105

A **polygon** is a closed figure formed by 3 or more line segments.

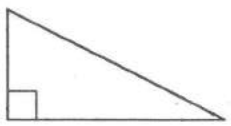
Polygons are named according to the number of line segments they contain.



Write the number of sides for each polygon.

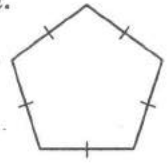
1. rectangle _____
2. pentagon _____
3. rhombus _____
4. octagon _____
5. trapezoid _____
6. decagon _____
7. square _____
8. nonagon _____
9. quadrilateral _____
10. triangle _____
11. parallelogram _____
12. heptagon _____

Name the polygon and state whether it is regular. If not, state why not.

13. 

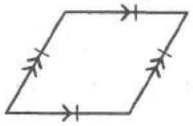
_____

_____

14. 

_____

_____

15. 

_____

_____

16. 

_____

_____

Name each polygon in questions 17–20.

17. a quadrilateral with exactly 2 parallel sides

_____

18. a quadrilateral with opposite sides parallel and equal in length

_____

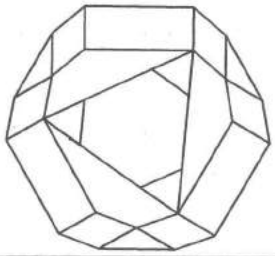
19. a quadrilateral with 2 pairs of parallel sides and four right angles

_____

20. a polygon with 7 equal sides

_____

21. Name each different polygon that you can see in the diagram and state the number of each.



_____

_____

_____

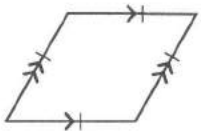
22. John said, "I have drawn a hexagon with all the sides equal. It has 2 acute angles and 4 obtuse angles." Can John's statement be correct? Explain why or why not.

_____

_____

_____

23. Name the polygon shown below.



_____

24. Sketch an identical polygon beside the polygon shown above, leaving no space between the 2 polygons. Name the new polygon.

_____

25. If 2 squares are laid side by side, what polygon is formed?

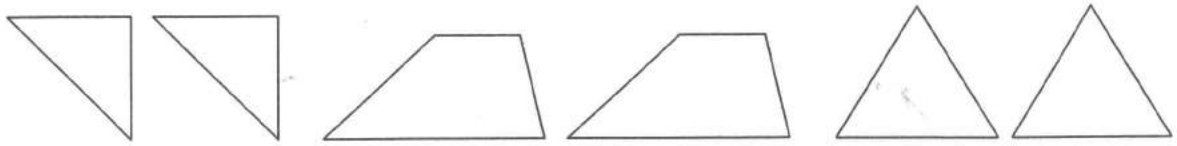
_____

Name _____

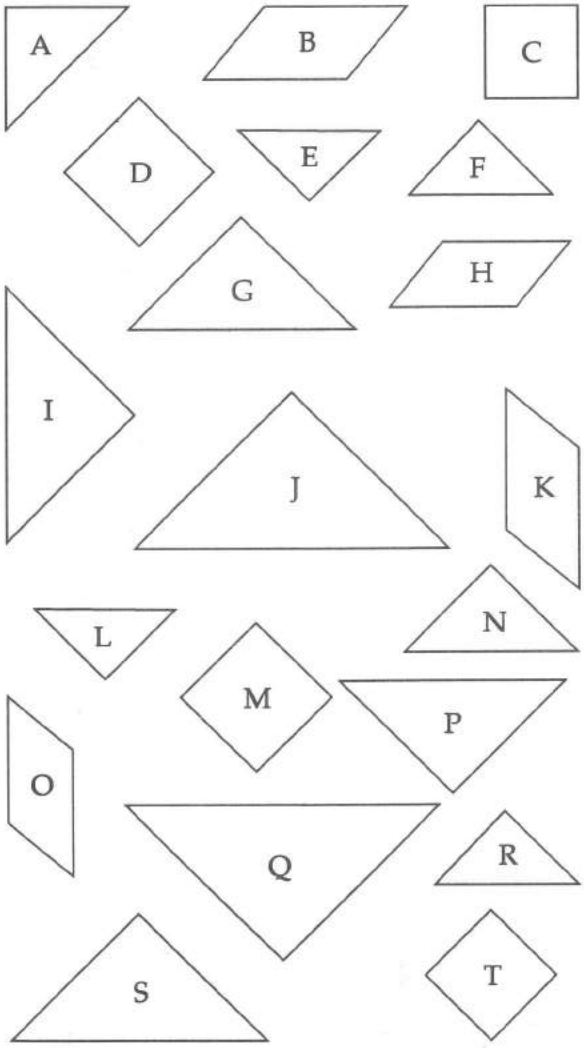
3.10 Congruent Figures

MATHPOWER™ *Seven*, **pp. 108–109**

Figures are **congruent** if they are identical in size and shape.

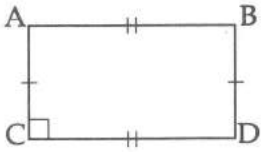


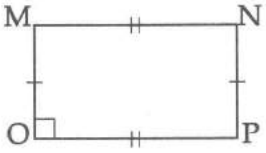
1. Use tracing or measurement to identify pairs of congruent tangram pieces.



2. Trace the tangram pieces. Then, carefully cut them out. Use the cut-out figures to create other congruent figures.

3. The rectangles shown below are congruent. Match the corresponding parts.





AB = _____ BD = _____

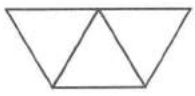
AC = _____ CD = _____

∠A = _____ ∠B = _____

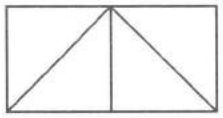
∠C = _____ ∠D = _____

Use tracing or measurement to determine which figures are constructed only from congruent triangles.

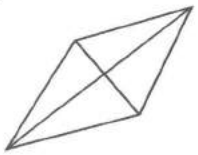
4.



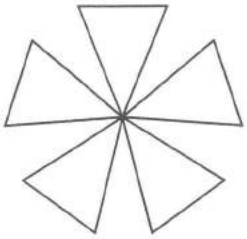
5.



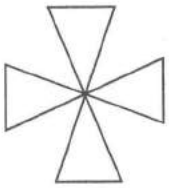
6.



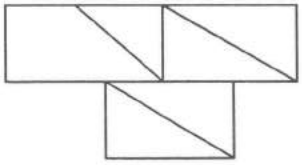
7.



8.



9.



Name _____

3.11 Problem Solving: Identify the Extra Information

MATHPOWER™ *Seven*, pp. 112–113

The table shows some important dates in the development of Canadian transportation. Use the information in the table to answer questions 1–4.

1809	Voyage of first steamship
1840	First steamer mail service
1908	First successful hydrofoil tested
1921	Construction of *Bluenose*
1959	Opening of St. Lawrence Seaway
1966	First commercial submarine built

1. How many years after the *Bluenose* was constructed was the first submarine built?

_____

2. How many years after the voyage of the first steamship was the St. Lawrence Seaway opened?

_____

3. What event occurred exactly 99 years after the first voyage of the first steamship?

_____

4. What information did you not use to answer questions 1–3?

_____

5. In the 1917–1918 season, 36 games were played in the NHL and 342 goals were scored. In the 1970–1971 season, 546 games were played and 3409 goals were scored. How many more goals were scored in the 1970–1971 season than in the 1917–1918 season?

_____

6. The longest recorded jump by a dog is 14 m and by a kangaroo is 12.8 m. The longest jump by a rider on a horse is 8.4 m. How much longer was the dog's jump than the horse's?

_____

7. Jozef earned $28.00 babysitting last week. He bought an audiotape for $8.49 and two posters for $4.25 each. How much did Jozef spend?

_____

8. The original McIntosh apple tree was planted in 1811, 4.5 m away from the house of John McIntosh. It continued to bear fruit until 1906. For how many years did the tree bear fruit?

_____

9. In 1986, the population of Hamilton, Ontario, was 306 728. Of that population, 40 285 people were over 65. In the same year in Winnipeg, Manitoba, 73 170 of the total population of 594 551 were over 65.

a) How many people in Winnipeg were 65 or younger?

_____

b) What was the total number of people over 65 in the two cities?

_____

10. McLellan Middle School has 6 study areas in the library. Each one needs 72 tiles for the floor. The tiles come in packages of 24. How many tiles are needed for the 6 study areas?

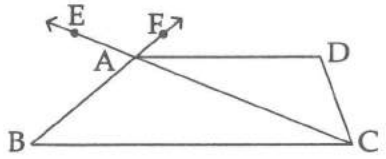
_____

Name _____

Test One CHAPTER 3: Geometry

MATHPOWER™ *Seven*, pp. 81–117

In the diagram below, name each of the following.



1. 4 points _____

2. 4 line segments _____

3. 5 angles _____

_____

4. 2 rays that intersect at A _____

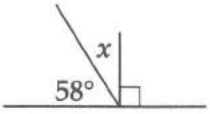
Classify each of the following angles.

5. 23° _____ **6.** 108° _____ **7.** 86° _____

8. 219° _____ **9.** 90° _____ **10.** 175° _____

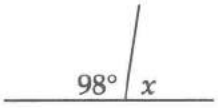
Determine the missing angle measures.

11.



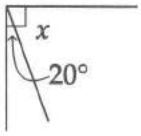
$\angle x =$ _____

12.



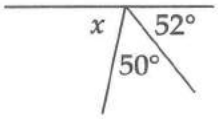
$\angle x =$ _____

13.



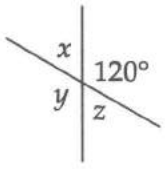
$\angle x =$ _____

14.



$\angle x =$ _____

15.

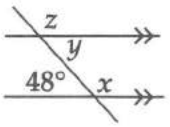


$\angle x =$ _____

$\angle y =$ _____

$\angle z =$ _____

16.



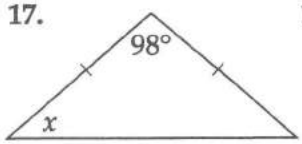
$\angle x =$ _____

$\angle y =$ _____

$\angle z =$ _____

Classify each triangle in two ways.

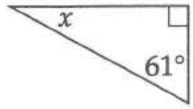
17.



_____

_____

18.



_____

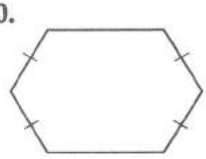
_____

19. Determine the missing measure in each of the above triangles.

a) $\angle x =$ _____ **b)** $\angle x =$ _____

Name each polygon and state whether it is regular. If not, state why not.

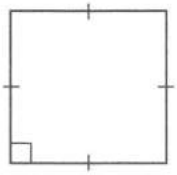
20.



_____

_____

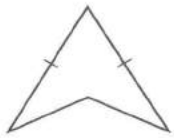
21.



_____

_____

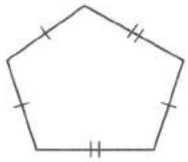
22.



_____

_____

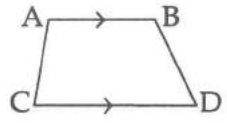
23.

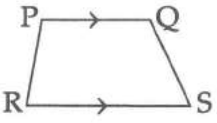


_____

_____

24. The trapezoids are congruent. Match the corresponding parts.





AB = _____ AC = _____

CD = _____ BD = _____

$\angle A =$ _____ $\angle B =$ _____

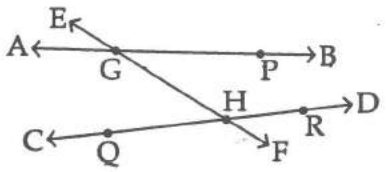
$\angle C =$ _____ $\angle D =$ _____

Name _____

Test Two CHAPTER 3: Geometry

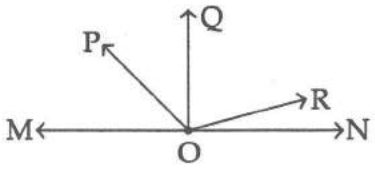
MATHPOWER™ *Seven*, pp. 81–117

In the diagram below, use symbols to name each of the following.



1. 3 line segments _____
2. 4 angles _____
3. 2 rays that intersect at H _____
4. 2 lines that intersect at G _____
5. 2 angles with vertex H _____

Measure and classify each angle.



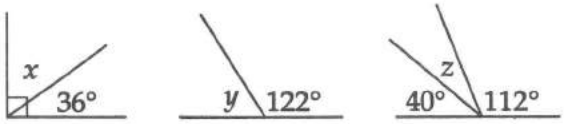
6. ∠MOP _____ 7. ∠QON _____
8. ∠POQ _____ 9. ∠POR _____
10. ∠QOR _____ 11. ∠PON _____
12. ∠RON _____ 13. ∠MOR _____

_____

_____

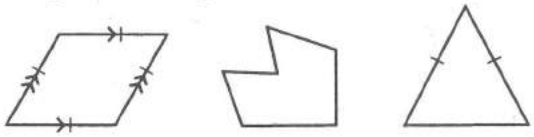
Determine the missing angle measures.

14. 15. 16.



∠x = _____ ∠y = _____ ∠z = _____

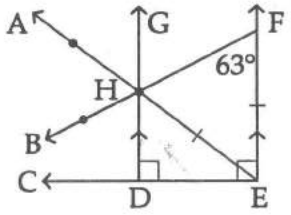
17. Name each polygon and state if any of the figures are regular. If not, state why not.



_____

_____

Use the following diagram to identify each pair of rays as intersecting, parallel, or perpendicular.



18. $\overrightarrow{EA}$ and $\overrightarrow{FB}$ _____

19. $\overrightarrow{EC}$ and $\overrightarrow{EF}$ _____

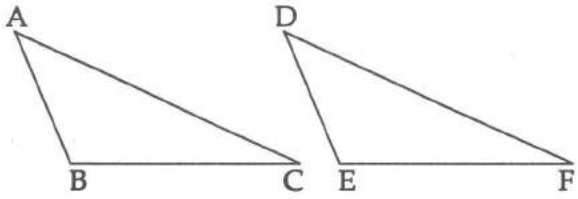
20. $\overrightarrow{DG}$ and $\overrightarrow{FB}$ _____

21. $\overrightarrow{DG}$ and $\overrightarrow{EF}$ _____

Use the diagram for questions 18–21 to determine the following angle measures.

22. ∠FHE _____ 23. ∠FEH _____
24. ∠GDE _____ 25. ∠AHB _____

The following triangles are congruent.



26. Classify the triangles in two ways.

_____

27. Name the corresponding sides.

_____

28. ∠ABC = 118° and ∠BCA = 26°. Calculate the measure of ∠BAC.

_____

29. Name the angles in ΔDEF and state their measures.

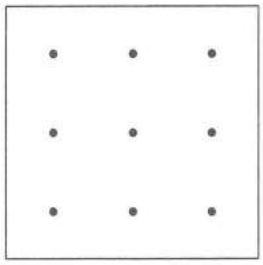
_____

Name _____

Extension CHAPTER 3: Geometry

MATHPOWER™ *Seven*, pp. 81–117

Answer questions 1–6, using the diagram of a 3 by 3 geoboard.



1. How many points are represented?

_____

2. Each horizontal and vertical distance between pegs is 1 unit. How many lines can be shown with the following lengths?

a) 1 unit **b)** 2 units **c)** 3 units

_____ _____ _____

3. How many diagonal lines can be shown on the pegboard?

_____

4. What is the total number of squares that can be made on the pegboard?

_____

5. How many different rectangles can be made? State their dimensions in units.

_____

_____

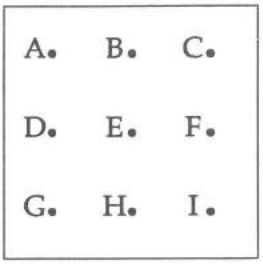
6. Is it possible to make the following polygons on the pegboard? If so, sketch an example.

a) triangle _____ **b)** parallelogram _____

c) trapezoid _____ **d)** pentagon _____

e) rhombus _____ **f)** hexagon _____

Use the pegboard with pegs labelled A to I. Connect pegs to answer questions 7–16.



7. Name a right angle, an acute angle, and an obtuse angle.

_____

8. Name two pairs of perpendicular lines.

_____

9. Name two pairs of parallel lines.

_____

10. Determine the measure of each of the following angles.

∠CEF _____ ∠GAI _____ ∠DBF _____

11. Classify each of these angles.

∠AHI _____ ∠ABE _____ ∠ACD _____

12. Name two right-angled isosceles triangles that are not congruent.

_____

13. Name an isosceles triangle with no right angle.

_____

14. Classify ΔDGI in two ways.

_____

15. Sketch and name a triangle congruent to ΔDGI.

16. Name the corresponding sides and angles in the congruent triangles.

_____ _____ _____

_____ _____ _____

Name _____

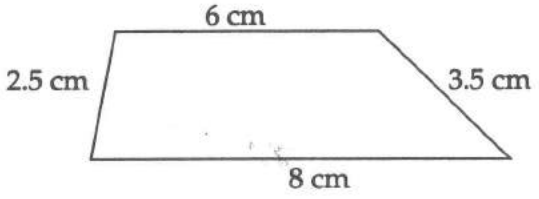
4.1 Perimeter

MATHPOWER™ *Seven*, pp. 124–125

The **perimeter** of a figure is the distance around it.

$P = 2.5 + 6 + 3.5 + 8$
$= 20$

The perimeter is 20 cm.



State the best unit of measurement for each perimeter.

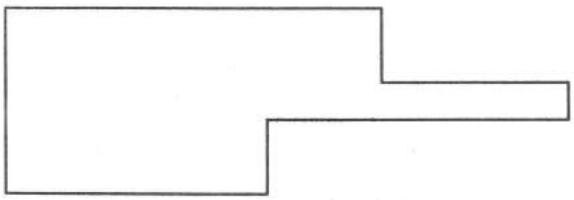
1. a football field _____
2. a provincial park _____
3. a placemat _____
4. the school parking lot _____
5. a calculator key _____

Complete each statement.

6. 420 cm = _____ m
7. 1700 m = _____ km
8. 650 mm = _____ cm
9. 8.3 km = _____ m
10. 5.6 m = _____ cm

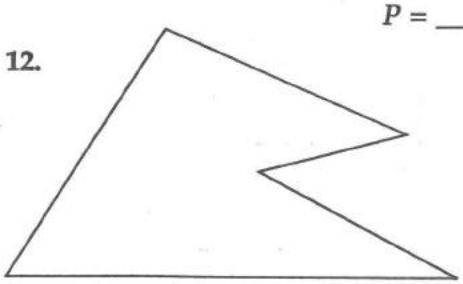
Estimate, then measure each side of each figure. Calculate each perimeter.

11.



P = _____

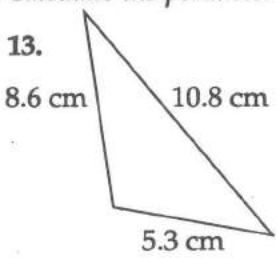
12.



P = _____

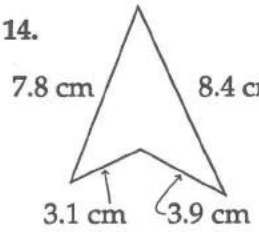
Calculate the perimeter of each figure.

13.



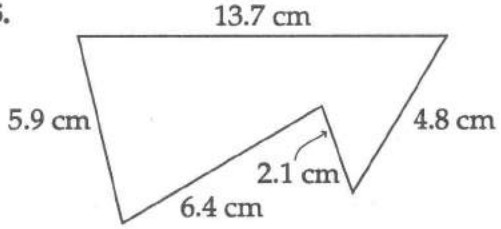
P = _____

14.



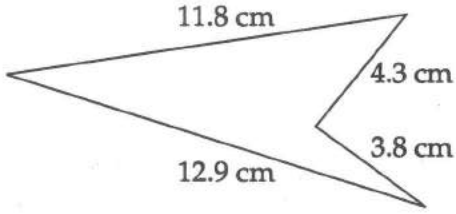
P = _____

15.



P = _____

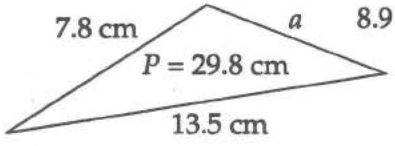
16.



P = _____

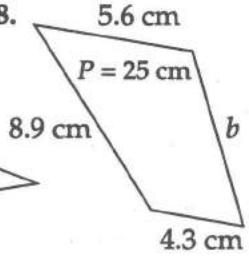
Calculate the missing length in each figure.

17.



a = _____

18.



b = _____

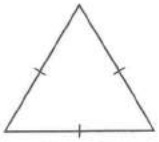
Name _____

4.2 Perimeters of Special Figures

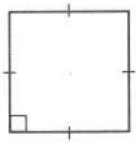
MATHPOWER™ *Seven*, pp. 126–129

Use formulas to calculate the perimeter of special figures.

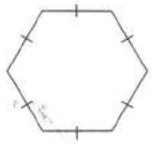
$P = 2l + 2w$



$P = 3s$



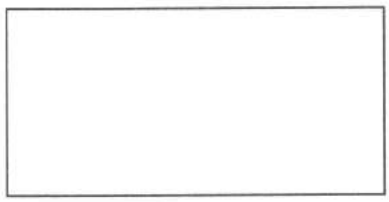
$P = 4s$



$P = 6s$

Estimate, then measure the length and width of each rectangle. Calculate each perimeter.

1.



$P =$ _____

2.

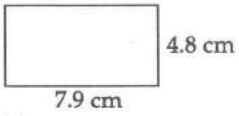
$P =$ _____

3.

$P =$ _____

Calculate each perimeter.

4.

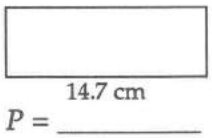


$P =$ _____

5.

$P =$ _____

6.



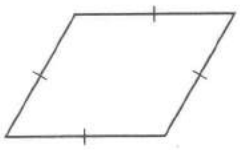
$P =$ _____

Complete the chart for each rectangle.

	l	w	P
7.	6	2	
8.	3.5	3	
9.		7	30
10.	8.2		28.4
11.		2.3	24.8

Estimate, then calculate the perimeter of each regular figure.

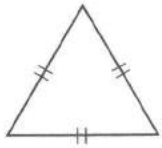
12.



$s = 3.8$ cm

$P =$ _____

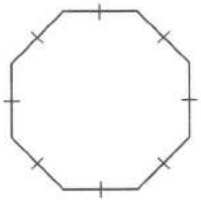
13.



$s = 4.4$ cm

$P =$ _____

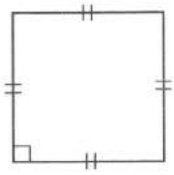
14.



$s = 2.5$ m

$P =$ _____

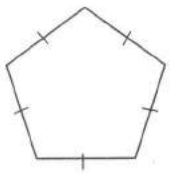
15.



$s = 6.2$ cm

$P =$ _____

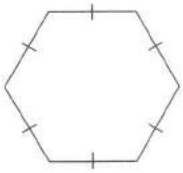
16.



$s = 9.6$ cm

$P =$ _____

17.



$s = 8.7$ cm

$P =$ _____

Calculate each perimeter.

18. a rectangle with $l = 6.2$ cm and $w = 3.4$ cm

$P =$ _____

19. a regular pentagon in which $s = 2.7$ cm

$P =$ _____

20. an equilateral triangle in which $s = 5.4$ cm

$P =$ _____

21. a regular octagon in which $s = 1.5$ m

$P =$ _____

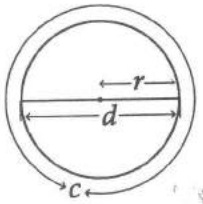
Name _____

4.3 Circumference

MATHPOWER™ *Seven*, pp. 128–129

The distance across a circle through the centre is the **diameter** of the circle.

The perimeter of a circle is its **circumference**.



$d = 2r$

$C = 2\pi r$

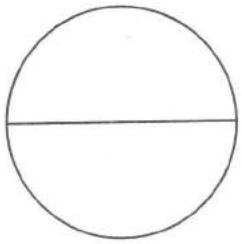
or $C = \pi d$

Use $\pi = 3.14$.

Measure the diameter of each circle to the nearest tenth of a centimetre. Then, calculate each circumference to the nearest hundredth.

1.

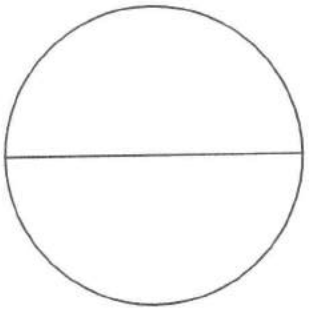
$d =$ _____



$C =$ _____

2.

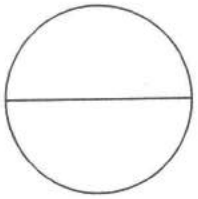
$d =$ _____



$C =$ _____

3.

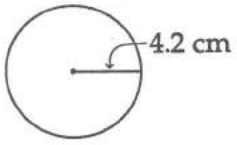
$d =$ _____



$C =$ _____

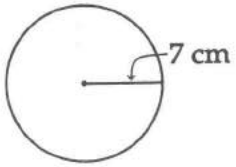
Calculate each circumference to the nearest hundredth of a centimetre.

4.



_____

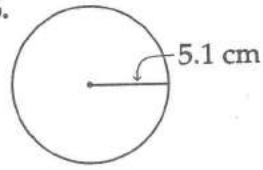
5.



_____

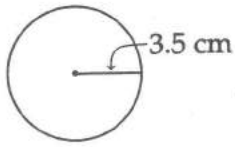
Calculate the circumference of each circle to the nearest tenth of a centimetre.

6.



_____

7.



_____

Use each radius to calculate the circumference to 2 decimal places.

8. $r = 6$ cm

_____

9. $r = 2.6$ cm

_____

10. $r = 8.25$ cm

_____

11. $r = 3.2$ cm

_____

12. $r = 12.1$ cm

_____

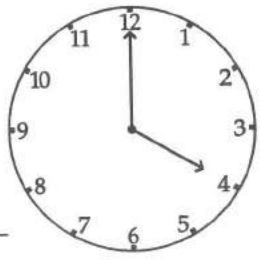
13. $r = 10.2$ cm

_____

14. The Quans planted a circular flower garden with a diameter of 2.3 m in their backyard. What length of fence, to the nearest tenth of a metre, is needed to completely surround the garden?

_____

15. The minute hand on the clock is 9.5 cm long and the hour hand is 7.5 cm long. What is the circumference of the circle traced by the end of each hand, to the nearest centimetre, as it rotates?



_____ _____

Name _____

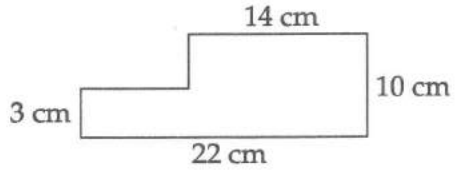
4.4 Working with Perimeter

MATHPOWER™ *Seven*, pp. 130–131

Understand the Problem | **Think of a Plan** | **Carry Out the Plan** | **Look Back**

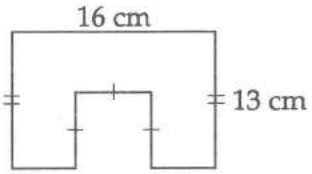
Calculate each perimeter.

1.



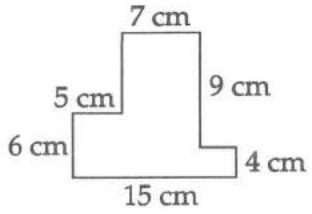
$P =$ _____

2.



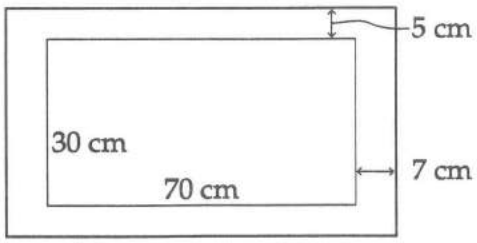
$P =$ _____

3.



$P =$ _____

The matting for a picture is shown below.



4. What is the perimeter of the inside edge of the matting?

_____

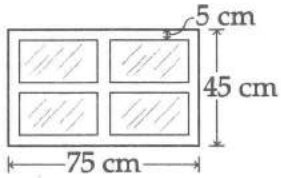
5. What is the perimeter of the outside edge of the matting?

_____

6. The framer charges 65¢/cm. How much will it cost to have the picture framed?

_____

Frances built a mirror like the one shown in the diagram.



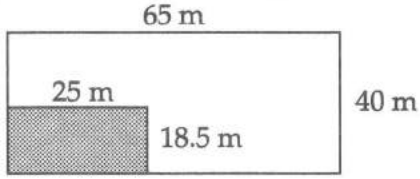
7. What is the perimeter of each piece of mirror?

_____

8. What is the length of wood needed for the entire mirror?

_____

In the playground below, the small rectangular region is paved. The remainder is grass.



9. How much fencing is needed to surround the grass?

_____

10. Fencing costs $32.00/m. What is the total cost of fencing for the playground?

_____

11. Bonita's mother glued a decorative border around the top of her bedroom wall. The bedroom is 4.2 m by 3.1 m.

a) What length of border did she need?

_____

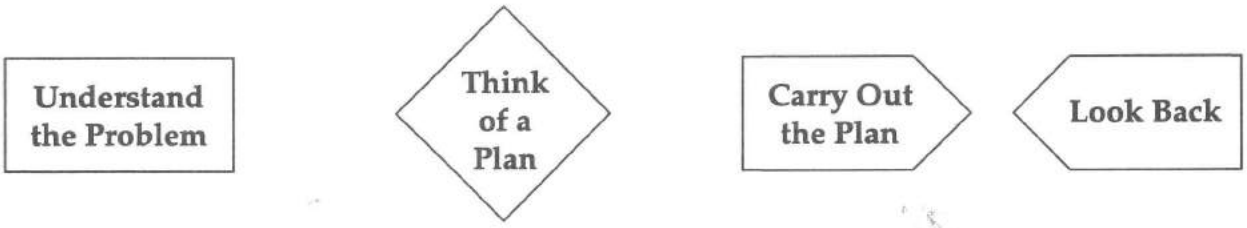
b) The border is sold in 10-m rolls. How many rolls did she buy?

_____

Name _____

4.5 Problem Solving: Find the Missing Information

MATHPOWER™ *Seven*, pp. 132–133



Describe the missing information.

1. The apartments are numbered consecutively up the right side and down the left side of the hallway. How many apartments are on each side of the hallway?

_____

2. A puppy eats 250 g of dry food each day. How long does a bag of food last?

_____

3. The saltwater crocodile is 2 m longer than a compact car. How long is the saltwater crocodile?

_____

4. Lise's father is four times older than Lise. How old is Lise's father?

_____

5. The kitchen floor is 10 m by 6 m. How many tiles will be needed to cover the floor?

_____

6. The baseball team scored 37 more runs this season than last season. How many runs did the team score this season?

_____

7. Bernie scored 28 more baskets than his brother did in a game of one-on-one. How many baskets did Bernie's brother score?

_____

Locate the missing information, then solve the problem.

8. A business envelope is 24 cm long. What is its perimeter?

_____

9. Jacques drove at an average speed of 80 km/h when he drove from Calgary to Regina. About how long did he drive?

_____

10. The Summer Olympic Games were held in Montreal in 1976. How long ago was that?

_____

11. In Dallol, Ethiopia, the average temperature is 34.4°C. What is the difference between this temperature and the highest temperature ever recorded in the world?

_____

12. William Shakespeare died 3 days before his birthday in 1616. How old would he have been on his birthday?

_____

13. Vincent Massey was the first person born in Canada to become Canada's Governor General. He was appointed in 1952. How many years after the first Governor General was appointed was Vincent Massey appointed?

_____

14. How many years after Vincent Massey's appointment was the first woman appointed Governor General?

_____

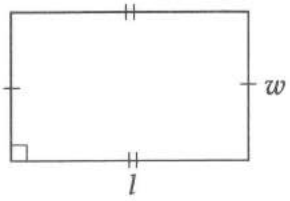
Name _____

4.6 Area of a Rectangle and Square

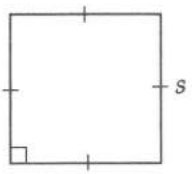
MATHPOWER™ *Seven*, pp. 138–139

The **area** of a figure is the measure of its surface.

In a rectangle, $A = l \times w$



In a square, $A = s^2$



State the best unit of measurement for each area.

1. a picnic tabletop _____
2. a driveway _____
3. this page _____
4. Hudson Bay _____
5. a postage stamp _____

Estimate, then calculate the area of each rectangle.

6.

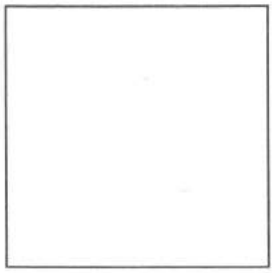
$A =$ _____

7.

$A =$ _____

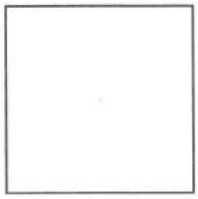
Estimate, then calculate the area of each square.

8.



$A =$ _____

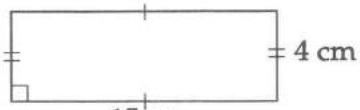
9.



$A =$ _____

Calculate the area of each figure.

10.



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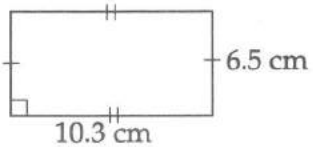
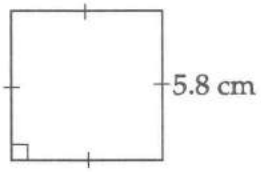
11.



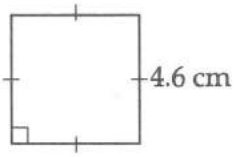
_____

12.



_____

13.



_____

Calculate the area of each rectangle.

14. $l = 8.2$ cm, $w = 2.5$ cm _____
15. $l = 12.6$ cm, $w = 5.8$ cm _____
16. $l = 10.7$ cm, $w = 7.4$ cm _____
17. $l = 42$ cm, $w = 32.75$ cm _____
18. $l = 17.4$ cm, $w = 8.8$ cm _____

Calculate the area of each square.

19. $s = 2.4$ cm _____
20. $s = 1.7$ cm _____
21. $s = 12.4$ cm _____
22. $s = 24$ cm _____
23. $s = 20.8$ cm _____

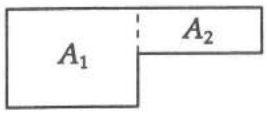
Name _____

4.7 Area of Figures

MATHPOWER™ *Seven*, pp. 140–141

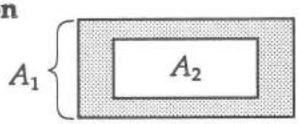
You can calculate the area of some figures by separating the figure into regions.

By addition



Area of figure = $A_1 + A_2$

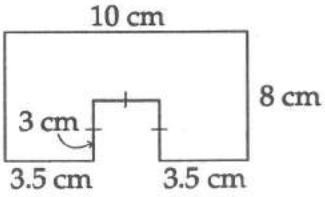
By subtraction



Area of shaded region = $A_1 - A_2$

Calculate the area of each figure. First divide each figure into rectangles and squares.

1.



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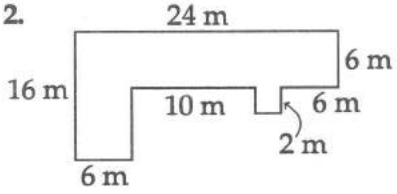
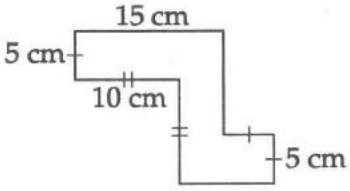
2.



_____

3.



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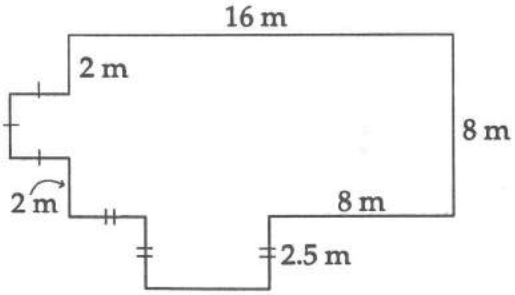
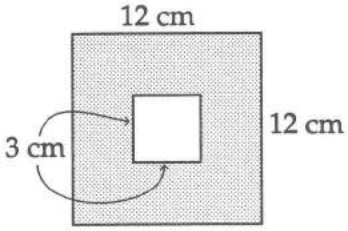
4.



_____

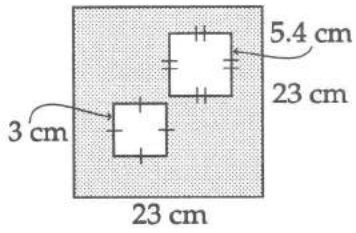
Calculate the area of each shaded region.

5.



_____

6.



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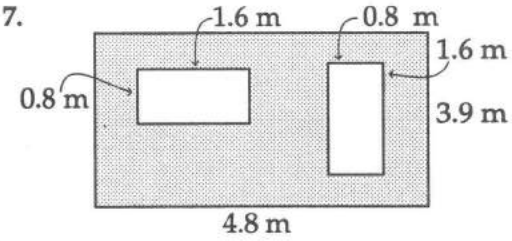
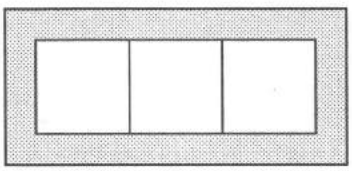
7.



_____

8. The carpet has 3 congruent squares surrounded by a dark border. The side of each square is 1.1 m and the carpet is 4 m by 1.8 m. What is the area of the border?



_____

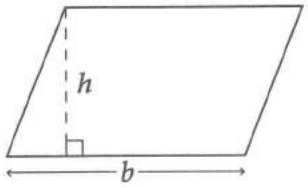
Name _____

4.8 Area of a Parallelogram

MATHPOWER™ *Seven*, pp. 142–143

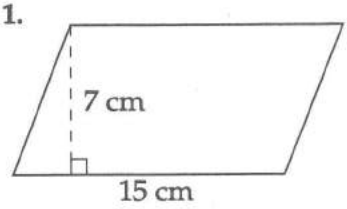
Every parallelogram has a **base** and a **height**.

The area of a parallelogram is $A = b \times h$.



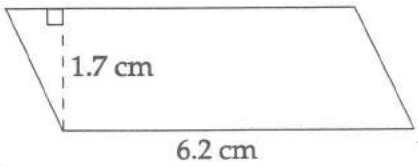
Calculate the area of each parallelogram.

1.



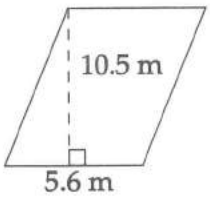
_____

2.



_____

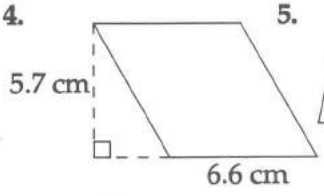
3.



_____

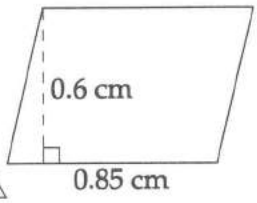
Calculate each area.

4.



_____

5.



_____

Calculate the area of each parallelogram.

6. $b = 6.7$ cm, $h = 5.3$ cm _____

7. $b = 14.4$ cm, $h = 11$ cm _____

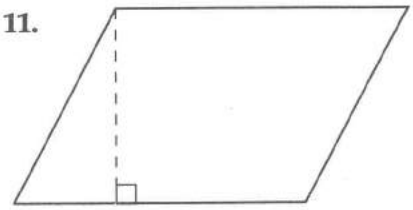
8. $b = 2.8$ cm, $h = 9.7$ cm _____

9. $b = 11.3$ m, $h = 10.4$ m _____

10. $b = 8.7$ cm, $h = 17.5$ cm _____

Measure the base and height of each parallelogram to the nearest tenth of a centimetre. Calculate each area.

11.

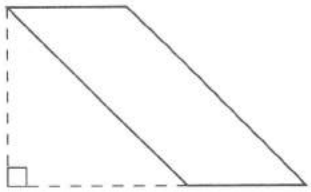


$b =$ _____

$h =$ _____

$A =$ _____

12.

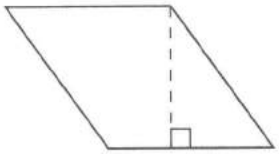


$b =$ _____

$h =$ _____

$A =$ _____

13.



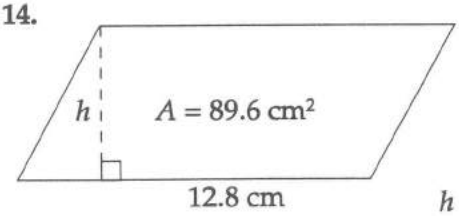
$b =$ _____

$h =$ _____

$A =$ _____.

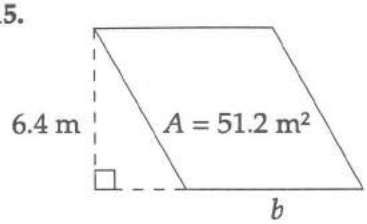
Find the missing measure.

14.



$h =$ _____

15.

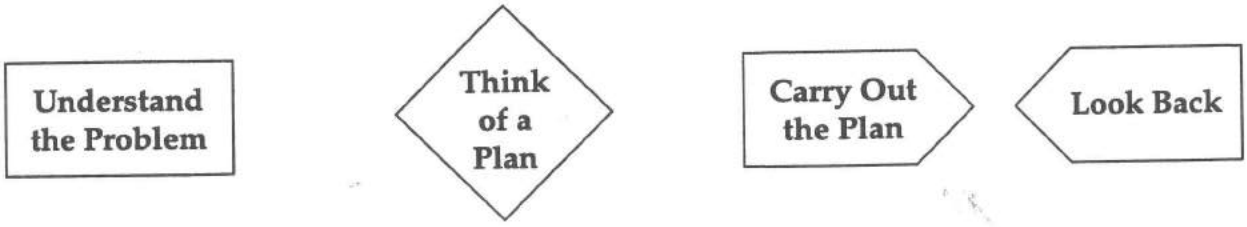


$b =$ _____

Name _____

4.9 Problem Solving: Use a Formula

MATHPOWER™ *Seven*, pp. 144–145



1. Petra drove at an average speed of 85 km/h on her trip to the cottage. Calculate how far she drove in the following numbers of hours. Use the formula $D = 85 \times h$, where D is the distance in kilometres and h is the number of hours.

a) 3 h _____ **b)** 5 h _____ **c)** 9 h _____

2. Sound travels at approximately 330 m/s. Calculate how far sound travels from its source in the following numbers of seconds. Use the formula $D = 330 \times t$, where D is the distance travelled in metres and t is the time in seconds.

a) 10 s _____ **b)** 4 s _____ **c)** 6.5 s _____

3. The weight of an object is expressed in newtons (N).

a) On the Earth, the weight of an object, W newtons, is given by the formula

$$W = 10 \times m$$

where m is its mass in kilograms.

On the Earth, what is the weight of a person with a mass of 60 kg?

_____

b) The mass of an object is the same on the moon as it is on the Earth. However, on the moon, the weight of the object is given by the formula

$$W = \frac{5 \times m}{3}$$

On the moon, what is the weight, in newtons, of the same person with a mass of 60 kg?

_____

c) How many times greater is the person's weight on the Earth than it is on the moon?

_____

4. A limousine service uses the formula $C = 50h \div p$ to determine how much to charge each passenger. C is the cost in dollars; h is the number of hours; p is the number of passengers. How much would the service charge each passenger in each situation?

a) 4 passengers rent for 5 h _____

b) 6 passengers rent for 4 h _____

c) 2 passengers rent for 7 h _____

d) 5 passengers rent for 1 day _____

5. Ms. Venturelli uses the formula $M = 4C - 0.25s$, to calculate the final mark on a history test. M is the mark out of 100; C is the number of correct answers; s is the number of spelling errors. Calculate the final mark in each situation.

a) 12 answers correct, 2 spelling errors _____

b) 18 answers correct, 10 spelling errors _____

c) 15 answers correct, no spelling errors _____

d) 16 answers correct, 4 spelling errors _____

6. Sylvia earns \$65.00 plus \$5.50/h for each week she works at the plant store. Write a formula to calculate how much she earns. Then, calculate her pay for each of the following numbers of hours worked in a week.

_____

a) 40 h _____

b) 24 h _____

c) 35 h _____

Name _____

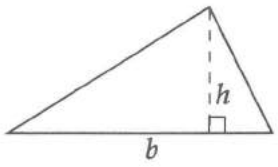
4.10 Area of a Triangle

MATHPOWER™ *Seven*, pp. 146–147

Every triangle has a **base** and **height**.
Another name for height is **altitude**.

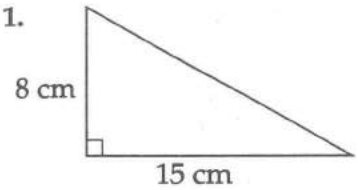
The area of a triangle is

$A = \frac{1}{2} \times b \times h$.



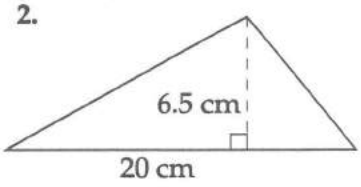
Calculate the area of each triangle.

1.



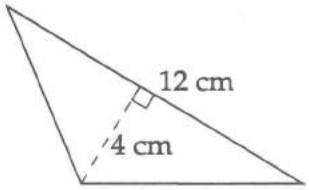
_____

2.



_____

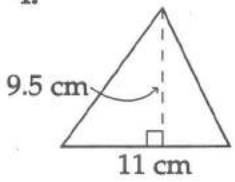
3.



_____

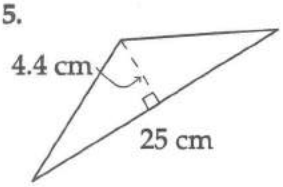
Calculate each area.

4.



_____

5.



_____

Calculate the area of each triangle.

6. $b = 3.4$ cm, $h = 7.6$ cm _____

7. $b = 12$ cm, $h = 10.6$ cm _____

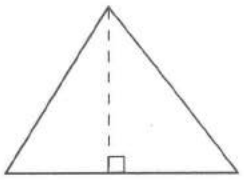
8. $b = 9$ cm, $h = 7$ cm _____

9. $b = 12.4$ m, $h = 8.7$ m _____

10. $b = 7.8$ cm, $h = 16.2$ cm _____

Measure the base and height of each triangle to the nearest tenth of a centimetre. Calculate each area.

11.

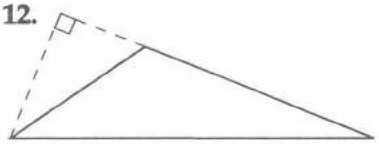


$b =$ _____

$h =$ _____

$A =$ _____

12.

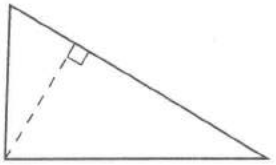


$b =$ _____

$h =$ _____

$A =$ _____

13.



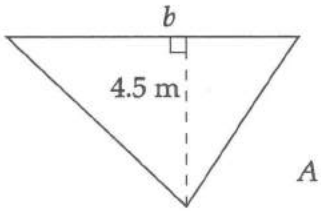
$b =$ _____

$h =$ _____

$A =$ _____

Find the missing measure.

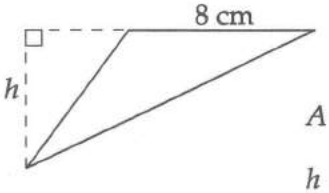
14.



$A = 54$ m^2

$b =$ _____

15.



$A = 38.8$ cm^2

$h =$ _____

Name _____

4.11 Working with Area

MATHPOWER™ *Seven*, pp. 150–151

Understand the Problem | **Think of a Plan** | **Carry Out the Plan** | **Look Back**

1. The basketball court is 26 m by 14 m. What is its area?

_____

2. The soccer field is 100 m by 73 m. What is its area?

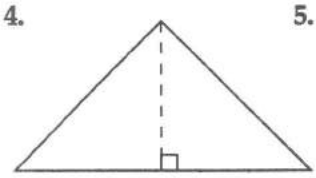
_____

3. About how many basketball courts would it take to cover the soccer field?

_____

Measure each of the figures to the nearest tenth of a centimetre. Calculate each area.

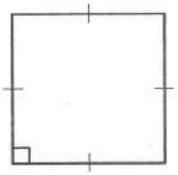
4.



_____

_____

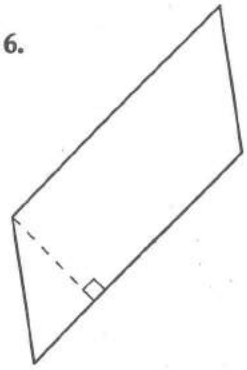
5.



_____

_____

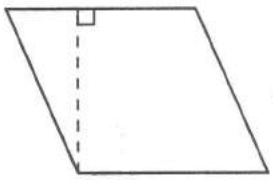
6.



_____

_____

7.



_____

_____

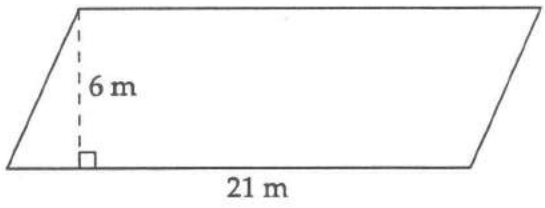
8. A design is drawn on a sheet of paper that measures 20 cm by 20 cm. The design is made using 2 triangles, 4 squares, 4 parallelograms, and 4 rhombuses with the dimensions shown in questions 4–7. How much of the paper is left uncovered?

_____

9. The school library is 24 m by 10.5 m. It has an uncarpeted office area in the corner that is 3.5 m by 3.5 m. What area of the library is carpeted?

_____

10. The Engels' yard is in the shape of a parallelogram. Find the area of the yard.



_____

11. Jean-Luc designed some desk accessories for his mother's birthday. He made a notepaper holder 10.5 cm by 16 cm, a paper tray 34 cm by 23 cm, a paper clip box 7 cm by 7 cm, and a pen and pencil tray 21 cm by 13 cm. What area of his mother's desk did the accessories cover?

_____

12. A kitchen counter measures 210 cm by 60 cm. The hole cut out for the sink is 78 cm by 46 cm. What is the area of the working surface of the counter?

_____

Name _____

4.12 Problem Solving: Use Logical Reasoning

MATHPOWER™ *Seven*, pp. 154–155

1. To begin a computer game, Fazil, Brigitte, Berta, and Brian each chose a two-digit number. The numbers were 26, 39, 41, and 18. Brigitte had the only prime number. Fazil's number was neither the smallest nor the largest. Berta's number was even. What number did each person select?

_____

_____

2. Maxine, Maurice, Gizella, and Myriam went to the library. They borrowed a video tape, an audio tape, a novel, and a non-fiction book. Maxine is researching a science project. Myriam will not have to read. Gizella will use the television. What item did each person borrow?

_____

_____

3. On a walk, Keiko collected an elm leaf, a birch leaf, an oak leaf, a maple leaf, and a willow leaf. She laid them on a table so that the willow leaf was farthest to the left, the maple leaf had only one leaf beside it, the birch leaf was not beside the elm leaf or the maple leaf, and the elm leaf was not in the middle. Determine the order of the leaves.

_____

_____

4. Milli's grandmother gave her $5.00. When she added it to her bank account, Milli had five times as much as she would have had if she had withdrawn $5.00. How much money was in the bank account after she deposited the $5.00?

_____

5. Rolf balanced 3 pens and his calculator with 12 coins. He then balanced his calculator with 1 pen and 4 coins. How many coins will he need to balance his calculator?

_____

_____

6. Each of the four Robson children has one pet. Curt's pet does not have feathers. Andrew's pet does not bark or live in a cage. Michael's pet does not have four legs. Cathy's pet is larger than all the others. Determine who owns the cat, the parrot, the dog, and the gerbil.

_____

_____

7. Make up a problem that can be answered using the following table.

	Stripes	Laces	Buckles	Brand Name
White	yes			
Black		yes		
Blue				yes
Grey			yes	

_____

_____

_____

_____

_____

_____

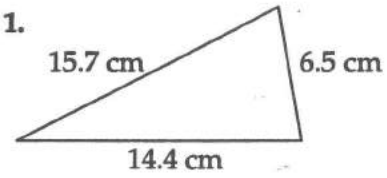
Name _____

Test One CHAPTER 4: Perimeter and Area

MATHPOWER™ *Seven*, pp. 119–161

Calculate each perimeter.

1.



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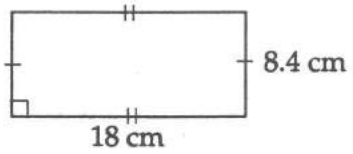
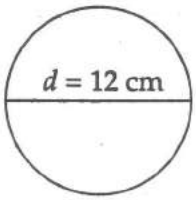
2.



_____

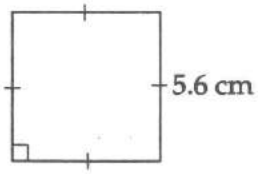
3.



_____

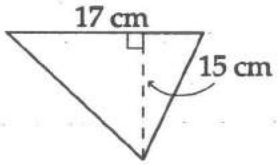
Calculate each area.

4.



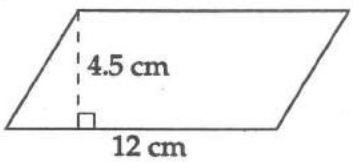
_____

5.



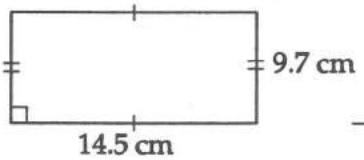
_____

6.



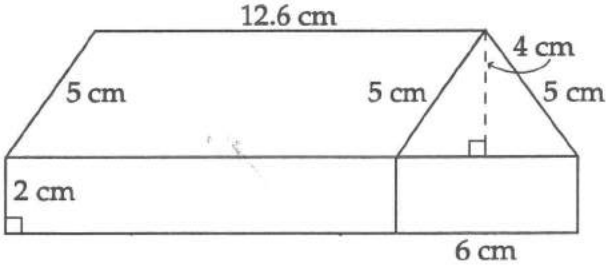
_____

7.



_____

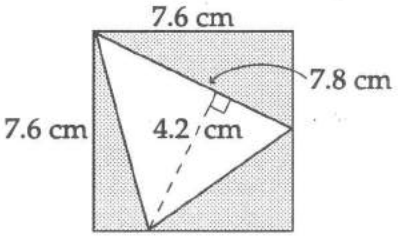
8. Calculate the perimeter and area of the figure.



P = _____

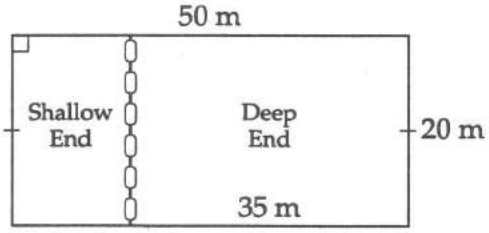
A = _____

9. Calculate the area of the shaded region.



_____

10. The recreation centre's swimming pool is 50 m long and 20 m wide. A rope divides the shallow end from the deep end as shown in the diagram. Calculate the area of each end.



Deep end _____

Shallow end _____

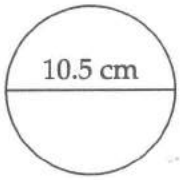
Name _____

Test Two CHAPTER 4: Perimeter and Area

MATHPOWER™ *Seven*, pp. 119–161

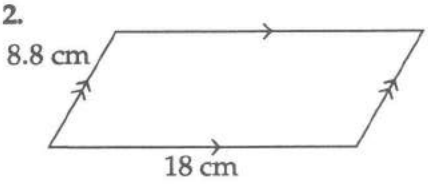
Calculate the perimeter of each figure.

1.



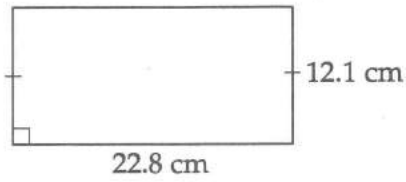
_____

2.



_____

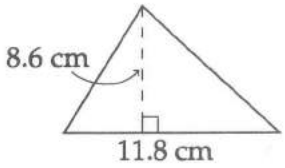
3.



_____

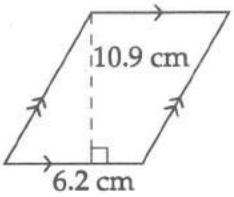
Calculate each area.

4.



_____

5.



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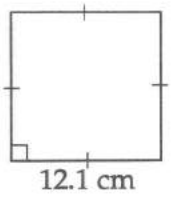
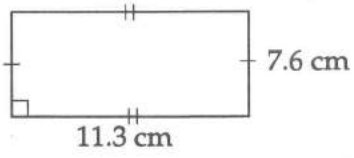
6.



_____

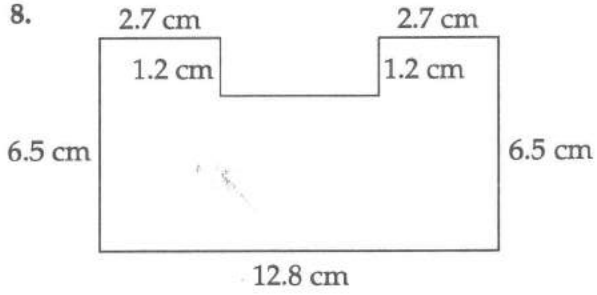
7.



_____

Calculate the perimeter and area of each figure.

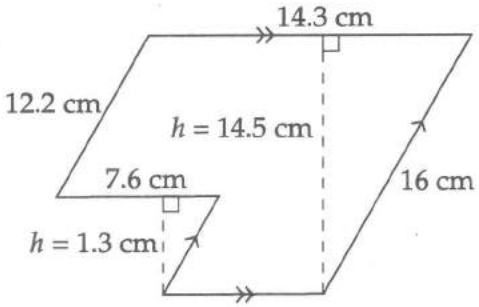
8.



P = _____

A = _____

9.



P = _____

A = _____

10. A circular flower garden is 2.5 m in diameter. Jared wants to put a strip of lawn edging around the outside edge of the garden. What length of lawn edging does he need?

_____

11. The largest movie screen in the world is in Jakarta, Indonesia. It measures 28.3 m by 21.5 m. What is the area of the screen?

_____

Name _____

Extension CHAPTER 4: Perimeter and Area

MATHPOWER™ *Seven*, pp. 119–161

Estimate, then calculate the perimeter and area of each of the following objects.

1. your desk

Estimate: $P =$ _____ $A =$ _____

Actual: $P =$ _____ $A =$ _____

2. a floor tile

Estimate: $P =$ _____ $A =$ _____

Actual: $P =$ _____ $A =$ _____

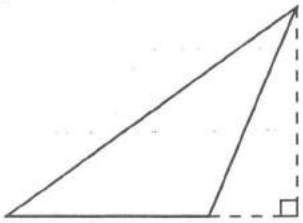
3. a page of this textbook

Estimate: $P =$ _____ $A =$ _____

Actual: $P =$ _____ $A =$ _____

Measure each figure to the nearest tenth of a centimetre. Calculate each perimeter and each area.

4.



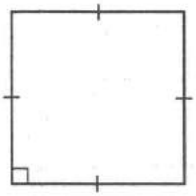
$b =$ _____

$h =$ _____

$P =$ _____

$A =$ _____

5.

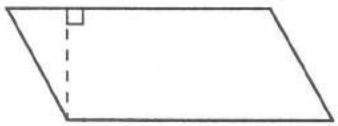


$s =$ _____

$P =$ _____

$A =$ _____

6.



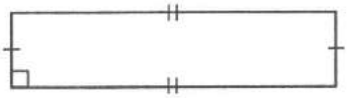
$b =$ _____

$h =$ _____

$P =$ _____

$A =$ _____

7.



$l =$ _____

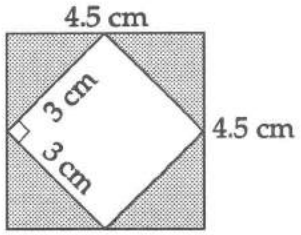
$w =$ _____

$P =$ _____

$A =$ _____

Calculate the area of the shaded region in each diagram.

8.



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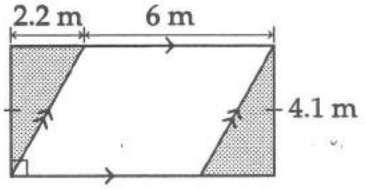
9.



_____

10. The largest book ever published was titled the *Super Book*. It was published in 1976 in Denver, Colorado, and measured 2.7 m by 3.1 m when open.

a) What was the perimeter and area of the open *Super Book*?

_____

b) If you laid the *Super Book* flat and open on the floor of your classroom, what area of classroom would be uncovered?

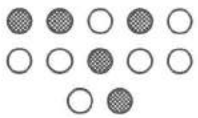
_____

Name _____

5.1 The Meaning of Fractions

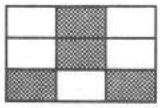
MATHPOWER™ *Seven*, pp. 166–167

A fraction can name parts of a group.



$\frac{5}{12}$ of the counters are shaded.

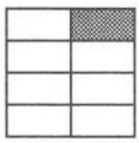
A fraction can also name parts of a whole.



$\frac{4}{9}$ of the diagram is shaded.

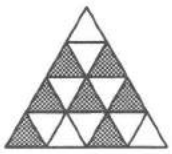
Write the fraction of each diagram that is
a) *shaded.*
b) *not shaded.*

1.



a) _____
b) _____

2.

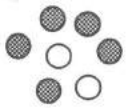


a) _____
b) _____

3.

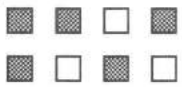
a) _____
b) _____

4.



a) _____
b) _____

5.



a) _____
b) _____

6.

a) _____
b) _____

The line is divided into equal parts.

What fraction of the whole line is the distance between these points?

7. AD _____ **8.** AF _____

9. BA _____ **10.** AG _____

11. GB _____ **12.** EA _____

13. When Malcolm emptied his coin bank, he found the following coins.

Write a fraction to represent the number of each coin as part of the total number.

a) dollars _____ **b)** quarters _____

c) dimes _____ **d)** nickels _____

14. What fraction of the letters in your first name are vowels?

_____

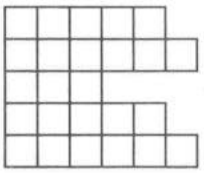
15. What fraction of the letters in your first name are consonants?

_____

16. Draw a diagram to show each fraction as part of a whole.

a) $\frac{1}{4}$ **b)** $\frac{3}{7}$

17. There are 25 squares in the pattern.



What fraction of the squares have these numbers of edges free?

a) 1 edge **b)** 2 edges **c)** 3 edges

_____ _____ _____

Name _____

5.2 Equivalent Fractions

MATHPOWER™ *Seven*, pp. 168–169

To write **equivalent fractions**, multiply or divide the numerator and denominator by the same number.

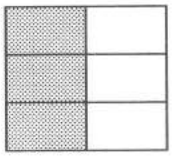
$$\frac{2}{7} = \frac{2 \times 3}{7 \times 3} = \frac{6}{21}$$

A fraction is in **simplest form** or **lowest terms** when the numerator and denominator have no common factors other than 1.

$$\frac{3}{12} = \frac{3 \div 3}{12 \div 3} = \frac{1}{4}$$

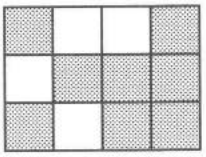
Write two equivalent fractions for the shaded part of each of the following diagrams.

1.



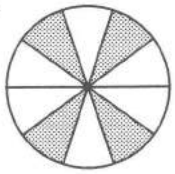
_____

2.



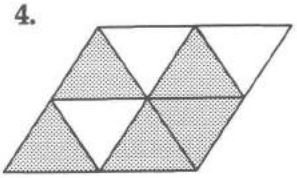
_____

3.



_____

4.



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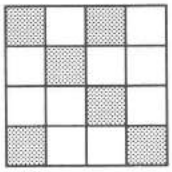
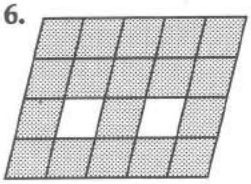
5.



_____

6.



_____

Find the numerator or the denominator.

7. $\frac{3}{4} = \frac{\square}{8}$

8. $\frac{12}{15} = \frac{4}{\square}$

9. $\frac{2}{3} = \frac{\square}{12}$

10. $\frac{\square}{6} = \frac{20}{24}$

11. $\frac{1}{2} = \frac{8}{\square}$

12. $\frac{1}{\square} = \frac{7}{21}$

Circle the fraction that does not belong in each group of equivalent fractions.

13. $\frac{2}{3}$ $\frac{4}{6}$ $\frac{6}{9}$ $\frac{5}{8}$ $\frac{8}{12}$ $\frac{10}{15}$

14. $\frac{3}{4}$ $\frac{6}{8}$ $\frac{9}{12}$ $\frac{12}{16}$ $\frac{15}{20}$ $\frac{16}{24}$

15. $\frac{2}{7}$ $\frac{4}{14}$ $\frac{6}{21}$ $\frac{8}{28}$ $\frac{15}{35}$ $\frac{12}{42}$

Insert = or ≠ between each pair of fractions.

16. $\frac{2}{5} \square \frac{6}{15}$

17. $\frac{10}{15} \square \frac{3}{5}$

18. $\frac{3}{5} \square \frac{9}{20}$

19. $\frac{30}{40} \square \frac{6}{8}$

Express each fraction in lowest terms.

20. $\frac{8}{22}$ _____

21. $\frac{7}{35}$ _____

22. $\frac{9}{18}$ _____

23. $\frac{5}{40}$ _____

24. $\frac{8}{12}$ _____

25. $\frac{6}{10}$ _____

26. $\frac{12}{16}$ _____

27. $\frac{6}{18}$ _____

28. $\frac{10}{25}$ _____

29. Which pairs of fractions are equivalent?

$\frac{1}{3}$ $\frac{9}{24}$ $\frac{1}{2}$ $\frac{9}{27}$ $\frac{14}{28}$ $\frac{2}{5}$ $\frac{18}{45}$ $\frac{3}{8}$

Name _____

5.3 Improper Fractions and Mixed Numbers

MATHPOWER™ *Seven*, pp. 170–171

An **improper fraction** represents more than one whole. The numerator is larger than the denominator.

$\frac{7}{5}$ is an improper fraction.

An improper fraction can be written as a mixed number.

$\frac{7}{5} = 1\frac{2}{5}$

$1\frac{2}{5}$ is a mixed number.

Write a mixed number and an improper fraction for each point on the number lines.

1.

_____ _____

2.

_____ _____

Write each improper fraction as a mixed number. Then, draw a point on each of the number lines to show the indicated fraction.

3. $\frac{6}{5}$ _____

4. $\frac{11}{4}$ _____

Complete each of the following.

5. $\frac{8}{3} = \square\frac{2}{3}$

6. $\frac{13}{4} = 3\frac{\square}{\square}$

7. $\frac{9}{5} = 1\frac{\square}{\square}$

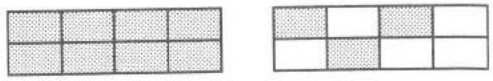
8. $1\frac{2}{3} = \frac{\square}{3}$

9. $4\frac{1}{5} = \frac{21}{\square}$

10. $\frac{17}{5} = 3\frac{\square}{\square}$

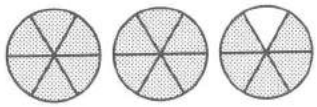
Write a mixed number and an improper fraction to represent each diagram.

11.



_____

12.



_____

Write each improper fraction as a mixed number.

13. $\frac{33}{5}$ _____

14. $\frac{9}{4}$ _____

15. $\frac{11}{3}$ _____

16. $\frac{23}{6}$ _____

17. $\frac{13}{8}$ _____

18. $\frac{47}{9}$ _____

19. $\frac{17}{2}$ _____

20. $\frac{15}{7}$ _____

21. $\frac{39}{5}$ _____

Write each mixed number as an improper fraction.

22. $1\frac{2}{5}$ _____

23. $3\frac{3}{4}$ _____

24. $2\frac{5}{8}$ _____

25. $4\frac{1}{2}$ _____

26. $5\frac{1}{3}$ _____

27. $1\frac{6}{7}$ _____

28. $6\frac{1}{4}$ _____

29. $3\frac{5}{9}$ _____

30. $10\frac{2}{3}$ _____

Name _____

5.4 Comparing and Ordering Fractions

MATHPOWER™ *Seven*, pp. 172–173

To compare fractions with a common denominator, compare the numerators.

$\frac{4}{7} < \frac{6}{7}$ because $4 < 6$

To compare fractions with different denominators, write the equivalent fractions with a common denominator, then compare numerators.

$2\frac{3}{4} > 2\frac{3}{5}$ because $2\frac{15}{20} > 2\frac{12}{20}$

Which fraction is larger?

1. $\frac{2}{7}, \frac{5}{7}$ _____

2. $\frac{4}{9}, \frac{8}{9}$ _____

3. $\frac{3}{8}, \frac{5}{8}$ _____

Write each pair of fractions with their lowest common denominator. Circle the larger fraction in each pair.

4. $\frac{1}{4}, \frac{1}{12}$ _____

5. $\frac{5}{6}, \frac{3}{5}$ _____

6. $\frac{2}{7}, \frac{2}{3}$ _____

7. $\frac{3}{4}, \frac{1}{5}$ _____

8. $\frac{9}{10}, \frac{8}{9}$ _____

9. $\frac{6}{7}, \frac{9}{11}$ _____

Insert > or < between each pair of fractions.

10. $\frac{3}{4} \square \frac{2}{3}$ **11.** $\frac{5}{9} \square \frac{5}{6}$ **12.** $\frac{5}{12} \square \frac{3}{5}$

13. $2\frac{1}{2} \square \frac{5}{4}$ **14.** $\frac{11}{3} \square 3\frac{3}{4}$ **15.** $\frac{31}{8} \square 3\frac{5}{6}$

Rewrite each set of fractions in order from smallest to largest.

16. $\frac{2}{3}, \frac{1}{4}, \frac{5}{6}, \frac{7}{12}$ _____

17. $\frac{9}{4}, 1\frac{5}{8}, 1\frac{1}{6}, \frac{17}{12}$ _____

Rewrite each set of fractions from largest to smallest.

18. $1\frac{3}{10}, \frac{11}{20}, \frac{1}{4}, \frac{7}{5}, 1\frac{3}{4}$

_____

19. $2\frac{1}{5}, \frac{9}{10}, 3\frac{1}{3}, \frac{9}{5}, \frac{2}{15}$

_____

Use the numerators and denominators listed in the boxes to complete questions 20–22.

Numerators		
2	8	11
15	4	

Denominators		
9	17	12
5	7	

20. Write 5 fractions, each with a value less than 1.

_____

21. Rewrite the fractions from question 20 in order from smallest to largest.

_____

22. Write 5 fractions, each with a value between 1 and 3.

_____

23. Rewrite the fractions from question 22 in order from smallest to largest.

_____

Name _____

5.5 Estimating Sums and Differences with Fractions

MATHPOWER™ *Seven*, pp. 174–175

Use the following rules to estimate with fractions.

When the numerator is much smaller than the denominator, round to 0.

$\frac{1}{6} \Rightarrow 0$

When the numerator is about half the denominator, round to $\frac{1}{2}$.

$\frac{4}{7} \Rightarrow \frac{1}{2}$

When the numerator is almost as large as the denominator, round to 1.

$\frac{7}{8} \Rightarrow 1$

Round each fraction to 0, $\frac{1}{2}$, or 1.

1. $\frac{2}{3}$ _____
2. $\frac{1}{5}$ _____
3. $\frac{5}{6}$ _____
4. $\frac{6}{11}$ _____
5. $\frac{1}{12}$ _____
6. $\frac{3}{4}$ _____
7. $\frac{7}{10}$ _____
8. $\frac{2}{9}$ _____
9. $\frac{7}{12}$ _____
10. $\frac{3}{10}$ _____
11. $\frac{5}{8}$ _____
12. $\frac{8}{11}$ _____

Circle the better estimate.

13. $\frac{1}{3} + \frac{4}{5}$ $\quad \frac{1}{2} \quad 1$
14. $\frac{5}{9} + \frac{1}{8}$ $\quad 0 \quad \frac{1}{2}$
15. $\frac{3}{4} + \frac{7}{11}$ $\quad 1 \quad 1\frac{1}{2}$
16. $\frac{7}{8} + \frac{5}{6}$ $\quad 1\frac{1}{2} \quad 2$
17. $\frac{1}{4} + \frac{3}{10}$ $\quad 0 \quad \frac{1}{2}$

Estimate.

18. $\frac{9}{10} + \frac{1}{3}$ _____
19. $\frac{4}{5} - \frac{7}{10}$ _____
20. $\frac{3}{8} + \frac{2}{3}$ _____
21. $\frac{8}{9} - \frac{1}{8}$ _____
22. $\frac{1}{6} + \frac{1}{4}$ _____
23. $\frac{3}{7} - \frac{1}{10}$ _____
24. $\frac{5}{12} + \frac{2}{9}$ _____
25. $\frac{5}{8} - \frac{6}{11}$ _____

26. Pardu read $\frac{1}{6}$ of his book one evening, and $\frac{3}{8}$ of it on the weekend.

a) Estimate how much he has read.

_____

b) About how much has he still to read?

_____

27. Mickey worked $3\frac{1}{2}$ h at a charity car wash, Helen worked $5\frac{1}{5}$ h, and Louis worked $2\frac{4}{5}$ h. About how long did they work altogether?

_____

Name _____

5.6 Adding Fractions

MATHPOWER™ *Seven*, pp. 176–177

Fractions with like and unlike denominators can be added as follows:

Like Denominators

$$\frac{4}{7}+\frac{2}{7}=\frac{4+2}{7}$$
$$=\frac{6}{7}$$

Unlike Denominators

$$\frac{3}{8}+\frac{1}{4}=\frac{3}{8}+\frac{2}{8}$$
$$=\frac{3+2}{8}$$
$$=\frac{5}{8}$$

$$\frac{1\times 2}{4\times 2}=\frac{2}{8}$$

Express all answers in lowest terms.

Add.

1. $\frac{2}{5}+\frac{1}{5}$ _____

2. $\frac{7}{8}+\frac{7}{8}$ _____

3. $\frac{1}{9}+\frac{4}{9}$ _____

4. $\frac{7}{8}+\frac{5}{8}$ _____

5. $\frac{3}{10}+\frac{1}{10}$ _____

6. $\frac{3}{7}+\frac{6}{7}$ _____

Find the LCD, then add.

7. $\frac{1}{2}+\frac{2}{6}$ _____

8. $\frac{1}{3}+\frac{1}{12}$ _____

9. $\frac{5}{15}+\frac{1}{5}$ _____

10. $\frac{1}{2}+\frac{1}{4}$ _____

11. $\frac{2}{5}+\frac{7}{10}$ _____

12. $\frac{1}{3}+\frac{7}{9}$ _____

Write the LCD for each pair of fractions.

13. $\frac{1}{3}, \frac{1}{5}$ _____

14. $\frac{2}{7}, \frac{1}{4}$ _____

15. $\frac{3}{4}, \frac{3}{5}$ _____

16. $\frac{2}{9}, \frac{5}{12}$ _____

17. $\frac{1}{3}, \frac{3}{7}$ _____

18. $\frac{1}{6}, \frac{4}{9}$ _____

Estimate, then add.

19. $\frac{2}{3}+\frac{4}{5}$ _____

20. $\frac{3}{8}+\frac{1}{6}$ _____

21. $\frac{3}{4}+\frac{1}{3}$ _____

22. $\frac{5}{6}+\frac{1}{4}$ _____

23. $\frac{3}{5}+\frac{1}{2}$ _____

24. $\frac{7}{10}+\frac{2}{3}$ _____

Add.

25. $\frac{3}{3}+\frac{1}{8}+\frac{1}{6}$ _____

26. $\frac{3}{4}+\frac{7}{12}+\frac{1}{3}$ _____

27. Pauline used $\frac{1}{2}$ m of red felt, $\frac{1}{6}$ m of green felt, and $\frac{3}{4}$ m of white felt for her art project.

a) How much red and green felt did she use?

_____

b) What is the total amount of felt Pauline used?

_____

Name _____

5.7 Subtracting Fractions

MATHPOWER™ *Seven*, pp. 178–179

Fractions with like and unlike denominators can be subtracted as follows:

Like Denominators

$$\frac{7}{9} - \frac{5}{9} = \frac{7-5}{9}$$

$$= \frac{2}{9}$$

Unlike Denominators

$$\frac{4}{5} - \frac{2}{15} = \frac{12}{15} - \frac{2}{15}$$

$$= \frac{12-2}{15}$$

$$= \frac{10}{15}$$

$$= \frac{2}{3}$$

$\frac{4 \times 3}{5 \times 3} = \frac{12}{15}$

Express all answers in lowest terms.

Subtract.

1. $\frac{3}{5} - \frac{1}{5}$ _____

2. $\frac{5}{8} - \frac{1}{8}$ _____

3. $\frac{5}{11} - \frac{2}{11}$ _____

4. $\frac{3}{6} - \frac{1}{6}$ _____

5. $\frac{7}{9} - \frac{2}{9}$ _____

6. $\frac{7}{10} - \frac{3}{10}$ _____

Find the LCD, then, subtract.

7. $\frac{1}{4} - \frac{1}{8}$ _____

8. $\frac{2}{3} - \frac{1}{6}$ _____

9. $\frac{11}{12} - \frac{1}{4}$ _____

10. $\frac{1}{2} - \frac{1}{10}$ _____

11. $\frac{8}{9} - \frac{1}{3}$ _____

12. $\frac{7}{10} - \frac{2}{5}$ _____

Write the LCD for each pair of fractions.

13. $\frac{3}{4}, \frac{1}{3}$ _____

14. $\frac{2}{5}, \frac{1}{7}$ _____

15. $\frac{1}{9}, \frac{5}{12}$ _____

16. $\frac{5}{6}, \frac{1}{4}$ _____

17. $\frac{1}{2}, \frac{2}{5}$ _____

18. $\frac{3}{8}, \frac{1}{6}$ _____

Estimate, then subtract.

19. $\frac{5}{8} - \frac{1}{3}$ _____

20. $\frac{3}{4} - \frac{1}{3}$ _____

21. $\frac{7}{12} - \frac{3}{8}$ _____

22. $\frac{5}{9} - \frac{1}{12}$ _____

23. $\frac{3}{5} - \frac{1}{2}$ _____

24. $\frac{5}{6} - \frac{3}{8}$ _____

25. $\frac{9}{10} - \frac{3}{4}$ _____

26. $\frac{7}{9} - \frac{1}{6}$ _____

27. Patio stones cover $\frac{1}{4}$ of Jordan's yard, and $\frac{1}{3}$ of the yard is grass. How much of the yard is left for planting a garden?

_____

28. Jean started the day with $\frac{7}{8}$ L of milk. She used $\frac{1}{4}$ L of milk at breakfast and $\frac{1}{2}$ L for supper. How much milk did Jean have left after supper?

_____

Name _____

5.8 Adding and Subtracting Mixed Numbers

MATHPOWER™ *Seven*, pp. 180–181

A **mixed number** is a number greater than 1. It consists of a whole number and a fraction. Add or subtract mixed numbers as follows:

Addition

$1\frac{1}{2} + 2\frac{1}{8}$

$= 1\frac{4}{8} + 2\frac{1}{8}$

$= 3\frac{5}{8}$

Addition with Regrouping

$1\frac{5}{6} + 3\frac{2}{3} = 1\frac{5}{6} + 3\frac{4}{6}$

$= 4\frac{9}{6}$

$= 5\frac{1}{2}$

Subtraction with Regrouping

$4\frac{1}{3} - 2\frac{1}{2} = 4\frac{2}{6} - 2\frac{3}{6}$

Since $\frac{2}{6} < \frac{3}{6}$, rewrite the first mixed number.

$3\frac{8}{6} - 2\frac{3}{6} = 1\frac{5}{6}$

Reduce all answers to lowest terms.

Write each sum.

1. $2\frac{3}{11} + \frac{1}{11}$ _____

2. $1\frac{3}{7} + 2\frac{2}{7}$ _____

3. $1\frac{7}{13} + 3\frac{1}{13}$ _____

4. $3\frac{2}{5} + 2\frac{1}{5}$ _____

Calculate each sum.

5. $3\frac{2}{5} + 2\frac{3}{4}$ _____

6. $2\frac{1}{2} + 2\frac{2}{3}$ _____

7. $1\frac{5}{6} + 2\frac{5}{9}$ _____

8. $3\frac{1}{4} + 2\frac{2}{3}$ _____

9. $1\frac{7}{12} + 2\frac{1}{6}$ _____

10. $4\frac{5}{8} + 2\frac{3}{4}$ _____

Estimate, then add.

11. $2\frac{2}{3} + 1\frac{5}{9} + 4\frac{1}{6}$ _____

12. $3\frac{2}{5} + 2\frac{1}{2} + 1\frac{1}{4}$ _____

Subtract.

13. $4\frac{2}{3} - 1\frac{1}{3}$ _____

14. $5\frac{5}{7} - 2\frac{4}{7}$ _____

15. $6\frac{5}{9} - 3\frac{2}{9}$ _____

16. $3\frac{7}{12} - 2\frac{5}{12}$ _____

Subtract. Regroup if necessary.

17. $2\frac{1}{2} - 1\frac{2}{5}$ _____

18. $3\frac{3}{8} - 1\frac{1}{4}$ _____

19. $2\frac{5}{6} - 1\frac{2}{3}$ _____

20. $4\frac{5}{6} - 2\frac{11}{12}$ _____

21. $4 - 2\frac{2}{5}$ _____

22. $6 - 2\frac{7}{8}$ _____

23. $5\frac{5}{9} - 3\frac{5}{6}$ _____

24. $3\frac{7}{12} - 1\frac{3}{4}$ _____

25. Jacquie drove for $2\frac{1}{3}$ h to get to an appointment that took $1\frac{1}{2}$ h, then she drove home. It took $1\frac{3}{4}$ h to drive home. How much time did Jacquie spend altogether?

_____

Name _____

5.9 Multiplying Fractions

MATHPOWER™ *Seven*, pp. 184–185

To multiply a fraction by a whole number or a fraction by a fraction, replace the word *of* with the symbol for multiplication (×).

Fraction of an Amount

$\frac{2}{5}$ of $1500 = \frac{2}{5} \times \frac{1500}{1}$

$= \frac{3000}{5}$

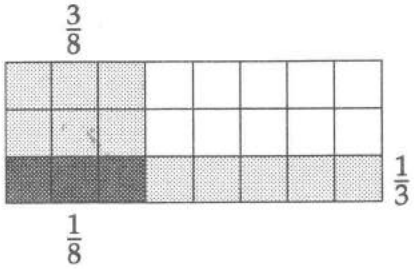
$= 600$

Fraction of a Fraction

$\frac{3}{8}$ of $\frac{1}{3} = \frac{3}{8} \times \frac{1}{3}$

$= \frac{3}{24}$

$= \frac{1}{8}$



Express all answers in lowest terms.

Calculate.

1. $\frac{1}{2}$ of 16 _____

2. $\frac{1}{4}$ of 20 _____

3. $\frac{1}{3}$ of 12 _____

4. $\frac{1}{5}$ of 35 _____

5. $\frac{2}{3}$ of 18 _____

6. $\frac{3}{7}$ of 21 _____

7. $\frac{5}{8}$ of 32 _____

8. $\frac{1}{6}$ of 54 _____

9. $\frac{3}{4}$ of 28 _____

Multiply.

10. $\frac{1}{3} \times \frac{1}{2}$ _____

11. $\frac{1}{4} \times \frac{1}{6}$ _____

12. $\frac{1}{3} \times \frac{3}{4}$ _____

13. $\frac{3}{5} \times \frac{3}{4}$ _____

14. $\frac{2}{3} \times \frac{7}{8}$ _____

15. $\frac{1}{4} \times \frac{5}{7}$ _____

16. $\frac{3}{10} \times \frac{1}{3}$ _____

17. $\frac{5}{6} \times \frac{3}{4}$ _____

18. $\frac{4}{9} \times \frac{1}{2}$ _____

19. $25 \times \frac{4}{5}$ _____

20. $\frac{2}{3} \times 12$ _____

21. $\frac{4}{15} \times 20$ _____

22. $\frac{3}{7} \times 42$ _____

23. $30 \times \frac{3}{4}$ _____

24. $11 \times \frac{1}{4}$ _____

Calculate each amount.

25. $\frac{4}{7} \times \$21.00$ _____

26. $\frac{4}{9}$ of 54 g _____

27. $\frac{3}{5}$ of 200 km _____

28. $\frac{5}{8}$ of 64 m _____

29. $\frac{3}{4}$ of 44 kg _____

30. $\frac{5}{6}$ of $91.50 _____

31. A store is holding a sale and has reduced the prices of all merchandise by $\frac{1}{5}$. Calculate the sale price for each of the following regularly priced items.

a) baseball glove $49.99 _____

b) golf bag $99.98 _____

c) 18-speed bicycle $179.99 _____

32. How many minutes are there in the following amounts of time?

a) $\frac{5}{12}$ of an hour _____

b) $\frac{5}{12}$ of a day _____

Name _____

5.10 Reciprocals: Mental Math

MATHPOWER™ *Seven*, pp. 186–187

Two numbers whose product is 1 are called **reciprocals**.

$8 \times \frac{1}{8} = 1$ $\quad \frac{3}{4} \times \frac{4}{3} = 1$ $\quad 1\frac{1}{5} \times \frac{5}{6}$

$= \frac{6}{5} \times \frac{5}{6}$

$= 1$

Complete each number statement.

1. $\frac{1}{2} \times \frac{\square}{\square} = 1$
2. $\frac{3}{8} \times \frac{\square}{\square} = 1$
3. $\frac{4}{5} \times \frac{\square}{\square} = 1$
4. $\frac{2}{11} \times \frac{\square}{\square} = 1$
5. $6 \times \frac{\square}{\square} = 1$
6. $12 \times \frac{\square}{\square} = 1$

Circle each pair of fractions that are reciprocals.

7. $\frac{1}{4}$, 4
8. $\frac{4}{5}$, $1\frac{1}{4}$
9. $\frac{2}{9}$, $\frac{9}{2}$
10. 3, $\frac{3}{1}$
11. $\frac{10}{7}$, $1\frac{3}{7}$
12. 2, $\frac{1}{2}$
13. $\frac{5}{8}$, $1\frac{3}{5}$
14. $\frac{25}{12}$, $\frac{1}{25}$
15. $\frac{15}{3}$, $\frac{1}{5}$

Write the reciprocal.

16. $\frac{1}{3}$ _____
17. $\frac{3}{7}$ _____
18. $\frac{15}{13}$ _____
19. $2\frac{1}{5}$ _____
20. $1\frac{1}{8}$ _____
21. 11 _____
22. $\frac{11}{12}$ _____
23. $4\frac{1}{4}$ _____
24. $1\frac{7}{9}$ _____

Complete each number statement.

25. $\frac{3}{5} \times \frac{\square}{\square} = 1$
26. $\frac{\square}{\square} \times 7 = 1$
27. $1\frac{5}{9} \times \frac{9}{14} = \frac{\square}{\square}$
28. $2\frac{3}{8} \times \frac{\square}{\square} = 1$
29. $\frac{\square}{\square} \times 1\frac{1}{6} = 1$
30. $5 \times \frac{1}{5} = \frac{\square}{\square}$
31. $3\frac{1}{2} \times \frac{\square}{\square} = 1$
32. $\frac{\square}{\square} \times \frac{4}{11} = 1$

33. A landscaping company mowed $\frac{2}{5}$ of the park in 1 h. How long did it take to mow the whole park?

_____

34. Each class period at Highfield School is $\frac{2}{3}$ h. How many periods are there from 09:00 to 12:00?

_____

35. Place Victoria in Montreal, Quebec, is approximately $\frac{1}{3}$ as tall as the CN Tower in Toronto, Ontario. How many times taller is the CN Tower than Place Victoria?

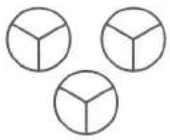
_____

Name _____

5.11 Dividing Fractions

MATHPOWER™ *Seven*, pp. 188–189

To divide fractions, multiply by the reciprocal of the divisor.



3 divided into $\frac{1}{3}$s

$3 \div \frac{1}{3}$

$= 3 \times 3$

$= 9$

$\frac{2}{3} \div \frac{3}{4}$

$= \frac{2}{3} \times \frac{4}{3}$

$= \frac{8}{9}$

Express all answers in simplest form.

Complete each of the following.

1. $\frac{3}{5} \div \frac{7}{9} = \frac{3}{5} \times \frac{\square}{\square}$

2. $\frac{1}{8} \div \frac{5}{6} = \frac{1}{8} \times \frac{\square}{\square}$

3. $\frac{1}{3} \div \frac{3}{4} = \frac{1}{3} \times \frac{\square}{\square}$

4. $\frac{4}{7} \div \frac{1}{2} = \frac{4}{7} \times \frac{\square}{\square}$

Divide.

5. $\frac{1}{2} \div \frac{2}{3}$ _____

6. $\frac{1}{4} \div \frac{1}{5}$ _____

7. $\frac{1}{3} \div \frac{1}{4}$ _____

8. $\frac{1}{2} \div \frac{3}{8}$ _____

9. $\frac{2}{5} \div \frac{4}{5}$ _____

10. $\frac{3}{4} \div \frac{1}{7}$ _____

11. $\frac{5}{6} \div \frac{1}{4}$ _____

12. $\frac{4}{7} \div \frac{2}{9}$ _____

13. $\frac{11}{12} \div \frac{1}{6}$ _____

Divide.

14. $\frac{1}{4} \div 3$ _____

15. $\frac{1}{5} \div 2$ _____

16. $\frac{1}{7} \div 5$ _____

17. $4 \div \frac{4}{5}$ _____

18. $2 \div \frac{2}{3}$ _____

19. $6 \div \frac{3}{8}$ _____

20. $\frac{5}{6} \div 3$ _____

21. $5 \div \frac{5}{7}$ _____

22. $12 \div \frac{3}{4}$ _____

Divide.

23. $\frac{3}{7} \div \frac{9}{10}$ _____

24. $\frac{4}{5} \div 3$ _____

25. $\frac{1}{8} \div \frac{3}{4}$ _____

26. $6 \div \frac{3}{10}$ _____

27. $\frac{2}{3} \div \frac{5}{12}$ _____

28. $\frac{7}{9} \div \frac{2}{3}$ _____

29. $\frac{1}{12} \div 3$ _____

30. $\frac{1}{3} \div \frac{1}{8}$ _____

31. $\frac{7}{8} \div \frac{3}{4}$ _____

32. A restaurant chef has $\frac{3}{4}$ L of strawberry syrup. She uses $\frac{1}{40}$ L in each dessert she is making. How many desserts can she make?

_____

33. Harry cleaned his room. After $\frac{1}{4}$ h, he was $\frac{1}{3}$ finished. How long did it take him to clean his room?

_____

34. A train travelled 60 km in $\frac{3}{4}$ h. What was the speed of the train?

_____

Name _____

5.12 Multiplying and Dividing Mixed Numbers

MATHPOWER™ *Seven*, pp. 190–191

Change a mixed number to an improper fraction and multiply or divide as follows:

Mixed Number Multiplication

$$\frac{3}{5} \text{ of } 2\frac{3}{4} = \frac{3}{5} \times \frac{11}{4}$$
$$= \frac{33}{20}$$
$$= 1\frac{13}{20}$$

Mixed Number Division

$$\frac{3}{4} \div 1\frac{2}{3} = \frac{3}{4} \div \frac{5}{3}$$
$$= \frac{3}{4} \times \frac{3}{5}$$
$$= \frac{9}{20}$$

Express all answers in lowest terms.

Write each mixed number as an improper fraction, then multiply.

1. $1\frac{1}{2} \times 2\frac{1}{4}$ 2. $1\frac{1}{4} \times 2\frac{1}{3}$ 3. $1\frac{2}{5} \times 1\frac{1}{3}$

4. $3\frac{1}{2} \times 4\frac{2}{3}$ 5. $3\frac{1}{5} \times 3\frac{4}{7}$ 6. $3\frac{2}{5} \times 1\frac{3}{4}$

7. $1\frac{1}{5} \times 2\frac{1}{8}$ 8. $2\frac{1}{6} \times 1\frac{2}{5}$ 9. $3\frac{3}{5} \times 2\frac{1}{4}$

Calculate each amount.

10. $1\frac{5}{6}$ of \$84.00

11. $2\frac{2}{3}$ of 195 kg

12. $3\frac{7}{9}$ of 126 L

13. $2\frac{1}{4}$ of 32 m

14. Greg's fitness classes take $1\frac{1}{2}$ h. He works out 5 times each week. How long does he spend at fitness class each week?

15. During the summer, Franca babysat $5\frac{1}{2}$ h per day for $5\frac{1}{2}$ days a week over 6 weeks. How many hours did Franca work during the summer?

Complete each of the following.

16. $3\frac{3}{4} \div 2\frac{1}{4} = \frac{\square}{4} \div \frac{\square}{\square} = \frac{\square}{\square} \times \frac{\square}{\square} =$ _____

17. $3\frac{1}{8} \div 2\frac{7}{9} = \frac{\square}{\square} \div \frac{\square}{\square} = \frac{\square}{\square} \times \frac{\square}{\square} =$ _____

Write each mixed number as an improper fraction. Then, divide.

18. $1\frac{1}{5} \div 5$ 19. $2\frac{3}{8} \div 7$ 20. $3\frac{1}{3} \div \frac{1}{4}$

21. $5 \div 1\frac{2}{3}$ 22. $4 \div \frac{3}{4}$ 23. $3\frac{1}{3} \div 2\frac{1}{6}$

24. $2\frac{3}{5} \div 1\frac{3}{4}$ 25. $3\frac{7}{9} \div 1\frac{1}{3}$ 26. $2\frac{1}{5} \div 4\frac{3}{5}$

27. A bus travelled 192 km in $2\frac{2}{5}$ h. At what speed did the bus travel?

28. A dripping tap loses $2\frac{2}{3}$ mL/min. How long does it take for the tap to lose 40 mL of water?

29. Renni was mowing the lawn. After $1\frac{1}{2}$ h, she had completed $\frac{3}{4}$ of the lawn. How long did it take Renni to mow the whole lawn?

Name _____

5.13 Decimals and Fractions

MATHPOWER™ *Seven*, pp. 192–193

Fractions to Decimals

Terminating decimals

$\frac{7}{8} = 8\overline{)7.000}$ or 0.875

Repeating Decimals

$\frac{2}{3} = 3\overline{)2.000}$ or 0.666

$= 0.\overline{6}$

Decimals to Fractions

$0.9 = \frac{9}{10}$

$0.75 = \frac{75}{100}$ or $\frac{3}{4}$

$0.375 = \frac{375}{1000}$ or $\frac{3}{8}$

Write in decimal form.

1. $\frac{3}{10}$ **2.** $\frac{29}{100}$ **3.** $\frac{157}{1000}$

4. $3\frac{9}{10}$ **5.** $2\frac{23}{100}$ **6.** $4\frac{129}{1000}$

Write in decimal form.

7. $\frac{2}{5}$ **8.** $\frac{11}{20}$ **9.** $\frac{1}{8}$

10. $3\frac{1}{2}$ **11.** $11\frac{4}{5}$ **12.** $7\frac{5}{8}$

Write as a decimal. Round to the nearest tenth.

13. $\frac{5}{9}$ **14.** $\frac{5}{11}$ **15.** $6\frac{5}{7}$

Write as a decimal. Round to the nearest hundredth.

16. $\frac{3}{16}$ **17.** $\frac{5}{11}$ **18.** $\frac{7}{13}$

19. $\frac{5}{12}$ **20.** $2\frac{5}{6}$ **21.** $3\frac{2}{3}$

Write each of the following, using bar notation.

22. 3.128 128 ... **23.** 2.060 606 ...

24. 11.777 777 ... **25.** 5.681 818 ...

Express each fraction as a repeating decimal, using bar notation.

26. $\frac{1}{6}$ **27.** $\frac{5}{11}$ **28.** $\frac{4}{9}$

29. $\frac{5}{18}$ **30.** $\frac{1}{27}$ **31.** $\frac{1}{22}$

Write as a fraction in simplest form.

32. 0.53 **33.** 0.4 **34.** 0.6

35. 0.22 **36.** 0.34 **37.** 0.019

38. 0.80 **39.** 0.004 **40.** 0.36

41. 1.3 **42.** 11.5 **43.** 7.075

Insert >, <, or = between each pair of numbers.

44. $\frac{2}{3} \square$ 0.6 **45.** $\frac{2}{5} \square$ 0.45

46. $\frac{1}{8} \square$ 0.125 **47.** $\frac{1}{11} \square$ 0.09

Name _____

5.14 Order of Operations with Fractions

MATHPOWER™ *Seven*, page 194

The letters BEDMAS can help you to recall the correct order of the steps in the order of operations.

B	E	DM	AS
Brackets	Exponents	Divide and multiply in order from left to right.	Add and subtract in order from left to right.

Express all answers in lowest terms.

Evaluate.

1. $\frac{1}{4}$ of 28 **2.** $\frac{3}{5}$ of 80 **3.** $\frac{5}{8}$ of 48

_____ _____ _____

4. $2\frac{3}{4}$ of 20 **5.** $4\frac{5}{6}$ of 18 **6.** $2\frac{1}{7}$ of 42

_____ _____ _____

Complete the following chart.

	a	b	$a+b$	$a-b$	$a\times b$	$a\div b$
7.	$\frac{2}{3}$	$\frac{1}{2}$				
8.	$\frac{1}{2}$	$\frac{1}{4}$				
9.	$\frac{7}{8}$	$\frac{5}{6}$				
10.	$\frac{2}{3}$	$\frac{2}{5}$				

Simplify.

11. $\frac{3}{5}+\frac{1}{2}-\frac{3}{4}$ **12.** $\frac{1}{2}-\frac{3}{8}\times\frac{2}{5}$

_____ _____

13. $\frac{2}{3}+\frac{1}{6}+\frac{3}{4}$ **14.** $\frac{1}{3}\times\frac{3}{4}\div\frac{5}{8}$

_____ _____

15. $\frac{7}{8}+\left(\frac{3}{8}-\frac{1}{4}\right)$ **16.** $\frac{2}{3}\div\left(\frac{1}{3}\times\frac{3}{4}\right)$

_____ _____

Simplify.

17. $\frac{3}{4}$ of $12\div\frac{1}{2}$ **18.** $\frac{2}{5}\div\frac{1}{6}$ of 10

_____ _____

19. $\frac{1}{6}\div\frac{1}{3}$ of 2^2 **20.** $\frac{1}{3}\times\frac{3}{10}\div 5^2$

_____ _____

Evaluate the following.

21. $2\div\frac{1}{2}+\frac{3}{8}$ of 32 **22.** $\frac{3}{5}$ of $15-\left(\frac{1}{2}-\frac{1}{4}\right)$

_____ _____

23. $\frac{1}{4}$ of $10\times\left(\frac{1}{2}-\frac{1}{5}\right)$ **24.** $\frac{1}{6}-\left(\frac{1}{3}-\frac{1}{4}\right)$

_____ _____

25. $3^2+1\frac{1}{2}\div\frac{4}{5}$ **26.** $\frac{1}{8}\div\frac{1}{2}$ of $\left(\frac{1}{4}+\frac{2}{3}\right)$

_____ _____

Circle the larger of the two expressions.

27. $\left(\frac{1}{8}+\frac{3}{4}\right)\times\left(\frac{1}{3}+\frac{7}{10}\right)$ or $\frac{1}{8}+\frac{3}{4}\times\frac{1}{3}+\frac{7}{10}$

28. $\frac{5}{8}-\frac{2}{3}\times 2\frac{1}{4}+2\frac{1}{2}$ or $\left(\frac{5}{8}-\frac{1}{3}\right)\times\left(2\frac{1}{4}+2\frac{1}{2}\right)$

Name _____

Test One CHAPTER 5: Fractions

MATHPOWER™ *Seven*, pp. 163–199

Write each improper fraction as a mixed number.

1. $\frac{27}{4}$ **2.** $\frac{9}{5}$ **3.** $\frac{39}{7}$

4. $\frac{75}{9}$ **5.** $\frac{19}{6}$ **6.** $\frac{68}{11}$

Write each mixed number as an improper fraction.

7. $1\frac{4}{7}$ **8.** $2\frac{1}{2}$ **9.** $3\frac{7}{8}$

10. $1\frac{3}{4}$ **11.** $4\frac{5}{6}$ **12.** $5\frac{2}{13}$

Find the numerator or the denominator.

13. $\frac{4}{5} = \frac{20}{\square} = \frac{\square}{45}$ **14.** $\frac{4}{7} = \frac{\square}{42} = \frac{40}{\square}$

15. $\frac{3}{13} = \frac{\square}{39} = \frac{21}{\square}$ **16.** $\frac{7}{11} = \frac{42}{\square} = \frac{\square}{99}$

Order each group of fractions from smallest to largest.

17. $\frac{1}{2}$ $\frac{7}{9}$ $\frac{3}{5}$ $\frac{7}{8}$ _____

18. $\frac{11}{6}$ $\frac{7}{3}$ $1\frac{1}{4}$ $\frac{11}{5}$ _____

Simplify. Express your answers in lowest terms.

19. $\frac{4}{9} + \frac{2}{9}$ **20.** $\frac{7}{11} - \frac{2}{11}$

21. $\frac{3}{4} + \frac{1}{2}$ **22.** $\frac{7}{12} - \frac{1}{3}$

Simplify. Write your answers in lowest terms.

23. $2\frac{1}{4} + 3\frac{11}{12}$ **24.** $3\frac{1}{9} - 1\frac{5}{6}$

25. $3\frac{1}{3} + 2\frac{1}{4}$ **26.** $2\frac{2}{3} - 1\frac{1}{6}$

Simplify.

27. $\frac{1}{3}$ of $\frac{6}{7}$ **28.** $\frac{5}{8} \div \frac{9}{10}$

29. $\frac{4}{5} \times 4$ **30.** $8 \div \frac{2}{3}$

Simplify. Write your answers in lowest terms.

31. $\frac{4}{9} \times 4\frac{1}{4}$ **32.** $5\frac{2}{5} \div 1\frac{1}{2}$

33. $5 \times 2\frac{1}{10}$ **34.** $7 \div 1\frac{1}{6}$

Simplify, using the order of operations.

35. $10 - \left(1\frac{3}{8} \text{ of } 1\frac{3}{5}\right)$ **36.** $1\frac{1}{4} \div \left(\frac{3}{8} + \frac{3}{32}\right)$

37. $\left(\frac{7}{8} - \frac{1}{4}\right) \div 3^2 \times \frac{2}{3}$ **38.** $\left(3 - \frac{2}{5}\right) + \left(3 \div \frac{2}{5}\right)$

Write each fraction as a decimal.

39. $\frac{3}{4}$ **40.** $\frac{7}{10}$ **41.** $\frac{31}{100}$ **42.** $\frac{5}{11}$

Name _____

Test Two CHAPTER 5: Fractions

MATHPOWER™ *Seven*, pp. 163–199

Write each mixed number as an improper fraction.

1. $1\frac{5}{7}$ **2.** $3\frac{1}{9}$ **3.** $4\frac{4}{5}$

4. $1\frac{11}{12}$ **5.** $4\frac{8}{9}$ **6.** $5\frac{7}{13}$

Write each fraction as a mixed number in simplest form.

7. $\frac{17}{7}$ **8.** $\frac{22}{13}$ **9.** $\frac{56}{32}$

Reduce each fraction to lowest terms.

10. $\frac{6}{16}$ **11.** $\frac{14}{21}$ **12.** $\frac{24}{40}$

13. $\frac{26}{39}$ **14.** $\frac{60}{132}$ **15.** $\frac{77}{143}$

16. Rewrite each set of fractions in order from smallest to largest.

a) $\frac{9}{10}$ $\frac{3}{5}$ $\frac{7}{8}$ $\frac{1}{4}$ _____

b) $\frac{9}{6}$ $1\frac{1}{3}$ $\frac{7}{5}$ $\frac{17}{12}$ $1\frac{5}{6}$ _____

Simplify. Write your answers in lowest terms.

17. $\frac{5}{8}+\frac{7}{12}$ **18.** $\frac{3}{4}-\frac{2}{7}$

19. $\frac{1}{8}+\frac{1}{6}$ **20.** $\frac{3}{10}-\frac{1}{6}$

Simplify. Write your answers in simplest form.

21. $2\frac{11}{12}+5\frac{1}{6}$ **22.** $5\frac{2}{3}-3\frac{1}{9}$

23. $4\frac{3}{8}+2\frac{1}{4}$ **24.** $3\frac{2}{3}-1\frac{1}{2}$

Simplify.

25. $\frac{2}{5}\times\frac{3}{10}$ **26.** $\frac{1}{4}\div\frac{5}{12}$

27. $\frac{3}{7}\times\frac{2}{3}$ **28.** $\frac{5}{6}\div\frac{4}{9}$

Simplify. Write your answers in simplest form.

29. $2\frac{3}{4}\times1\frac{1}{2}$ **30.** $4\frac{8}{9}\div3\frac{2}{3}$

31. $1\frac{5}{8}\times3$ **32.** $1\frac{1}{4}\div2\frac{7}{8}$

Simplify, using the order of operations.

33. $\frac{5}{9}\div\left(2\frac{1}{4}+\frac{1}{2}\right)$ **34.** $\left(3\frac{1}{2}\times1\frac{1}{3}\right)+\left(2^2-2\frac{5}{6}\right)$

Write each amount in dollars and cents.

35. $\$5\frac{7}{9}$ **36.** $\$13\frac{3}{20}$ **37.** $\$27\frac{3}{5}$

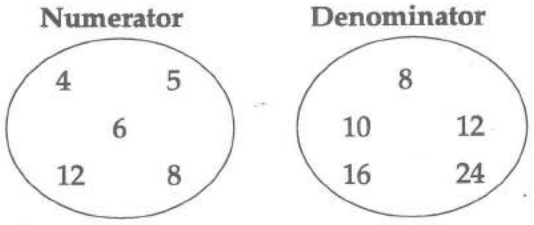
38. $\$9\frac{1}{3}$ **39.** $\$19\frac{1}{12}$ **40.** $\$11\frac{4}{9}$

Name _____

Extension CHAPTER 5: Fractions

MATHPOWER™ *Seven*, pp. 163–199

1. Use the numbers in the shapes to make fractions equivalent to each of the fractions shown below.



a) $\frac{1}{2}$ _____

b) $\frac{1}{3}$ _____

c) $\frac{1}{4}$ _____

2. Use a numerator of 15 and denominators less than 15 to write, in lowest terms, all the mixed numbers that are possible.

_____

_____

3. Calculate the following differences. Identify the pattern.

a) $\frac{1}{1\times2} - \frac{1}{2\times3}$ _____

b) $\frac{1}{1\times2} - \frac{1}{2\times3} - \frac{1}{3\times4}$ _____

c) $\frac{1}{1\times2} - \frac{1}{2\times3} - \frac{1}{3\times4} - \frac{1}{4\times5}$ _____

4. Write the next line of the pattern in question 3. Find the difference without subtracting.

_____

_____

5. A unit fraction has a numerator of 1. Fractions can be written as the sum of unit fractions. For example, $\frac{4}{9} = \frac{1}{3} + \frac{1}{9}$. Write each fraction as the sum of unit fractions.

a) $\frac{5}{8}$ _____ b) $\frac{3}{4}$ _____

c) $\frac{10}{21}$ _____ d) $\frac{7}{10}$ _____

6. Complete each square.

a)

Add Across →

$\frac{3}{4}$	$\frac{1}{6}$	
$\frac{2}{3}$	$\frac{1}{8}$	

Subtract Down ↓

b)

Multiply Across →

$\frac{4}{5}$	$\frac{3}{4}$	
$\frac{7}{8}$	$\frac{1}{2}$	

Divide Down ↓

7. Write 4 pairs of letters that represent pairs of reciprocals.

A	B	C	D	E	F	G	H
$1\frac{1}{8}$	$1\frac{2}{5}$	$2\frac{7}{9}$	$\frac{3}{4}$	$\frac{8}{9}$	$1\frac{1}{3}$	$\frac{9}{25}$	$\frac{5}{7}$

_____

8. Rewrite the following numbers in order from smallest to largest.

$\frac{1224}{425}$; $(7 - 4.121)$; $2\frac{7}{8}$; 2.87; $\left(1\frac{3}{10} + 1\frac{1}{2}\right)$

_____

9. Use decimal equivalents to complete each of the following with >, <, or = .

a) $\frac{7}{8} \square \frac{4}{5}$ b) $\frac{5}{12} \square \frac{11}{13}$

c) $\frac{7}{11} \square \frac{7}{9}$ d) $\frac{5}{7} \square \frac{35}{49}$

10. Two numbers are reciprocals. One is sixteen times the other. What are the two numbers?

_____

Name _____

6.1 Ratio

MATHPOWER™ *Seven*, pp. 204–205

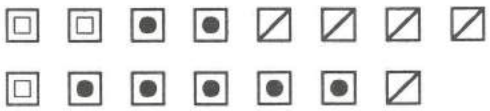
A **ratio** compares two numbers.

For example, the statement "3 of the 4 sweaters are red" can be written in ratio or fraction form.

Ratio Form	Fraction Form
3:4	$\frac{3}{4}$

The **first term** of the ratio is 3. The **second term** is 4.

Write the following ratios from these figures.



1. ☐ to ● _____

2. ⊘ to ☐ _____

3. ☐ to ⊘ _____

4. ● to all figures _____

State the ratios below for the whole numbers from 4 to 20.

5. odd numbers to even numbers

_____

6. multiples of 2 to multiples of 3

_____

7. multiples of 5 to all numbers

_____

8. In a leap year, what are the following ratios?

a) the days in February to the days in June

_____

b) the days in the year to the days in December

_____

Express each pair of quantities in the same unit. Write each pair as a ratio.

9. 47 min to 1 h _____

10. 6 pennies to 1 quarter _____

11. 33 cm to 1 m _____

12. 5 dimes to 3 pennies _____

13. 3 kg to 31 g _____

14. 4 min to 23 s _____

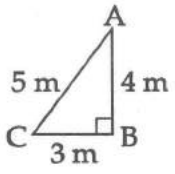
15. 71 m to 1 km _____

16. 353 mL to 5 L _____

17. 5 quarters to 7 pennies _____

18. 233 g to 4 kg _____

Use the diagram to write the ratios of the lengths.



19. AC to AB _____

20. BC to AB _____

21. perimeter to AC _____

22. **a)** Write the ratio of the provinces west of Saskatchewan to the provinces east of Saskatchewan.

_____

b) Write the ratio of the provinces east of Saskatchewan to all the provinces in Canada.

_____

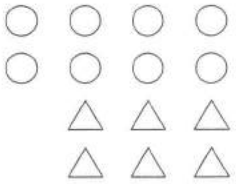
Name _____

6.2 Equivalent Ratios

MATHPOWER™ *Seven*, pp. 206–207

Equivalent ratios or **equal ratios** make the same comparison.

A ratio is in **simplest form** or **lowest terms** when the greatest common factor of the terms is 1.



ratio of ○ to △ is $\frac{8}{6}$

$\frac{8 \div 2}{6 \div 2} = \frac{4}{3}$

8:6 and 4:3 are equivalent ratios.

Write each ratio in lowest terms.

1. 12:4 _____

2. 45:9 _____

3. $\frac{36}{24}$ _____

4. $\frac{8}{14}$ _____

5. 13:52 _____

6. 6 to 4 _____

7. $\frac{7}{21}$ _____

8. 9 to 9 _____

9. 16 wins to 6 losses _____

10. 14 girls to 12 boys _____

Determine whether the following pairs of ratios are equivalent ratios.

11. $\frac{8}{24}, \frac{1}{3}$ _____

12. $\frac{3}{5}, \frac{16}{30}$ _____

13. 1 to 4, 7 to 28 _____

14. 2 to 5, 6 to 15 _____

15. 5:6, 10:14 _____

16. 2:9, 6:18 _____

17. 2 to 1, 12 to 24 _____

18. $\frac{2}{3}, \frac{18}{27}$ _____

19. Rachel sold 180 adult tickets and 110 student tickets to the school play. Write the ratio of adult tickets to student tickets in lowest terms.

_____

20. Express the ratio in lowest terms of consonants to vowels in each name.

a) Fredericton _____

b) Dartmouth _____

c) London _____

d) Flin Flon _____

e) Nanaimo _____

f) Moose Jaw _____

21. A collection of coins consists of 8 loonies, 14 quarters, 5 dimes, 10 nickels, and 5 pennies. Write the following ratios in lowest terms.

a) quarters to nickels _____

b) loonies to dimes _____

c) pennies to nickels _____

d) quarters to all coins _____

22. Jordan had 18 compact discs and 6 cassette tapes. Ana gave him 4 tapes and he gave Ana 2 compact discs.

a) In lowest terms, what was Jordan's original ratio of tapes to compact discs?

_____

b) In lowest terms, what was Jordan's new ratio of tapes to compact discs?

_____

Name _____

6.3 Solving Proportions

MATHPOWER™ *Seven*, pp. 208–209

When 2 ratios are equal, we have a **proportion.**

$\frac{1}{3} = \frac{4}{12}$ is a proportion.

Proportions can be used to find lowest terms.

$$\frac{8}{36} = \frac{8 \div 4}{36 \div 4}$$

$$= \frac{2}{9}$$

Find the unknown values.

1. $\frac{3 \times \square}{4 \times \square} = \frac{9}{12}$

2. $\frac{4 \times \square}{5 \times \square} = \frac{28}{35}$

3. $\frac{10 \div \square}{15 \div \square} = \frac{2}{3}$

4. $\frac{22 \div \square}{42 \div \square} = \frac{11}{21}$

5. $\frac{\square \div 6}{\square \div 6} = \frac{2}{3}$

6. $\frac{\square \times 4}{\square \times 4} = \frac{36}{44}$

7. $\frac{7 \times 6}{10 \times 6} = \frac{\square}{\square}$

8. $\frac{24 \div 6}{30 \div 6} = \frac{\square}{\square}$

Find the missing term.

9. $\frac{1}{3} = \frac{\square}{15}$

10. $\frac{8}{12} = \frac{2}{\square}$

11. $\frac{\square}{10} = \frac{4}{40}$

12. $\frac{3}{\square} = \frac{18}{42}$

13. 11:12 = 44:□

14. 8:3 = □:9

15. □:57 = 3:19

16. 15:□ = 5:2

For questions 17–20, write the proportion, then solve for the unknown.

17. 1 h is to \$6.00 as 5 h is to \$ _____

18. 7 pens are to \$2.80 as _____ pens are to \$5.60

19. 80 km is to 1 h as 400 km is to _____ h

20. 5 grapefruit are to \$1.95 as _____ grapefruit are to \$5.85

21. Two pairs of socks cost \$6.00. How much do 6 pairs of socks cost?

_____

22. Janet earns \$15.00 in 3 h cleaning windows. How much should she earn in 15 h?

_____

23. In a student election, 5 out of 9 students voted for the successful student council president. How many students voted for the winning candidate if there are 1080 students in the school?

_____

24. In a set of tabletops, the ratio of length to width is 4:3. What is the width of each table if the length is as follows?

a) 16 cm _____

b) 36 cm _____

c) 48 cm _____

d) 60 cm _____

25. The ratio of the height to the length of an Arctic wolf is 2:3. If the average length is 150 cm, what is the average height in centimetres?

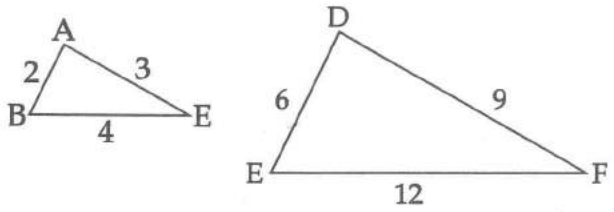
_____

Name _____

6.4 Similar Triangles

MATHPOWER™ *Seven*, pp. 212–213

Figures that have the same shape are called **similar figures**.

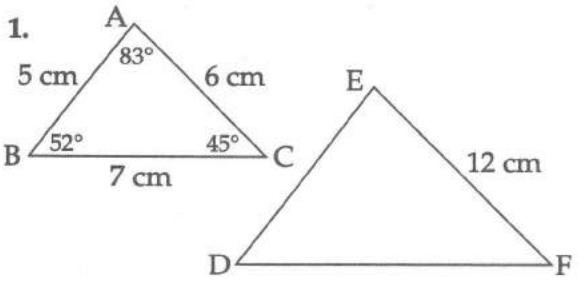


$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$

$\angle A = \angle D$ $\angle B = \angle E$ $\angle C = \angle F$

The pairs of triangles are similar. Calculate the missing dimensions.

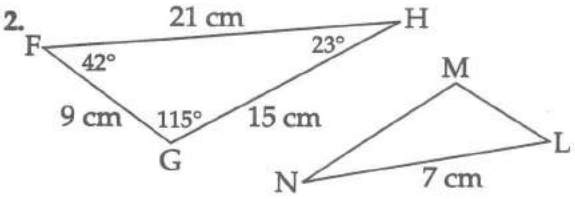
1.



$\angle D =$ _____ $\angle E =$ _____ $\angle F =$ _____

$ED =$ _____ $DF =$ _____

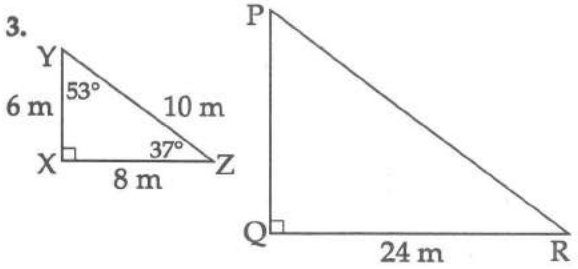
2.



$\angle M =$ _____ $\angle N =$ _____ $\angle L =$ _____

$MN =$ _____ $ML =$ _____

3.

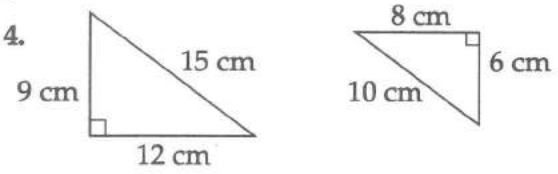


$\angle P =$ _____ $\angle R =$ _____

$PQ =$ _____ $PR =$ _____

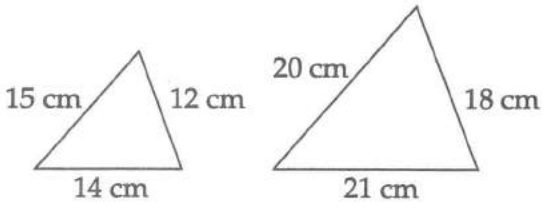
Which pairs of triangles are similar? Explain your answer.

4.



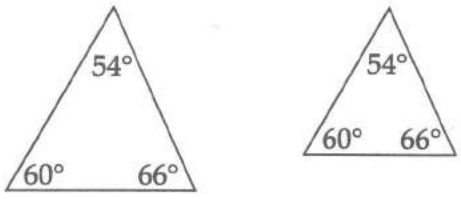
_____

5.



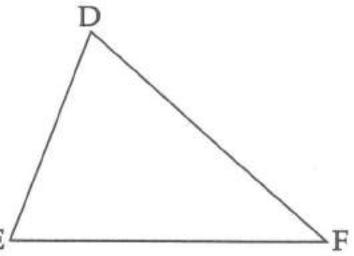
_____

6.



_____

7. a) Measure the sides and angles of ΔDEF. Draw ΔGHI similar to ΔDEF in which GH is 6 cm. Use a ruler and protractor.



b) Complete the ratios.

$\frac{DE}{GH} = \frac{\square}{\square}$ $\frac{DF}{GI} = \frac{\square}{\square}$ $\frac{EF}{HI} = \frac{\square}{\square}$

8. A tree casts a shadow of 18 m when a 1-m fence post casts a shadow of 3 m. How tall is the tree?

_____

Name _____

6.5 Scale Drawings

MATHPOWER™ *Seven*, pp. 214–215

A **scale drawing** is used to show something that is too large or too small to draw to its actual size.

If a scale is 1:200, this means that 1 unit of length in the drawing represents 200 units of length on the actual figure.

Write each of the following as a scale ratio.

1. 1 cm represents 20 cm _____
2. 1 cm represents 1 m _____
3. 1 mm represents 1 cm _____
4. 1 m represents 1 cm _____
5. 0.5 cm represents 1 m _____
6. 50 cm represents 10 cm _____
7. 20 cm represents 1 km _____
8. 1 cm represents 0.5 m _____

Complete the chart.

	Measure on Scale Drawing	Scale	Actual Measure
9.	6 cm	1:10	
10.	10 cm	20:1	
11.	4.5 cm	1:100	
12.	2 cm	250:1	
13.	5 cm	1:50	
14.	12.5 cm	1000:1	
15.	6 cm	10:1	
16.	24.5 cm	1000:1	

17. The length of an ant is 0.4 cm. What is the length of a diagram of the ant if the scale is 20:1?

_____

18. The scale drawing of a statue is 15 cm. The scale is 1:100. What is the actual height of the statue?

_____

19. The width of a river on a map is 1.2 cm. What is the actual width if the scale is 1:500?

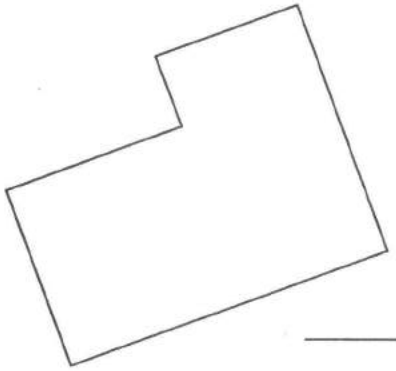
_____

20. A diagram of a postage stamp is 10.5 cm by 8.5 cm. The scale is 5:1. What are the dimensions of the stamp?

_____

21. A garden is 12 m by 7.5 m. Draw a scale drawing of the garden using a scale of 1:200.

22. a) Measure the dimensions of the diagram. Calculate the perimeter.



_____

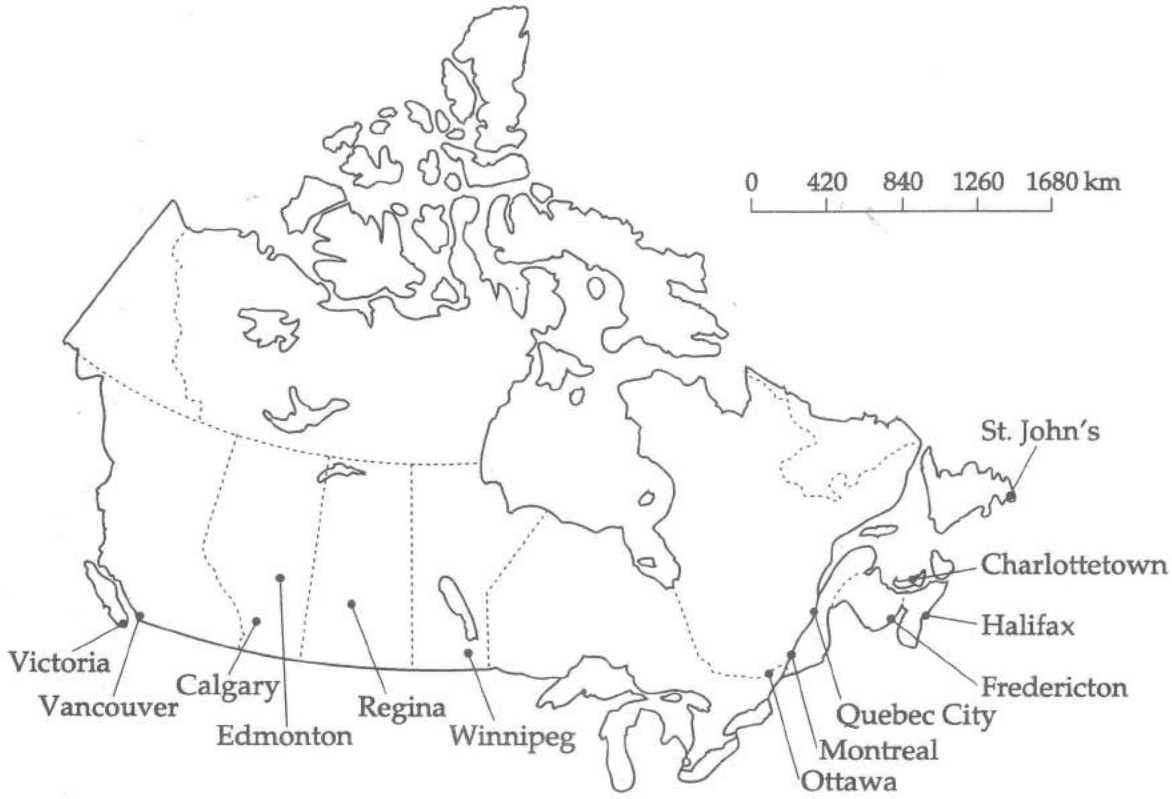
b) The scale of the diagram is 1:1000. Find the perimeter of the actual region.

_____

Name _____

6.6 Maps and Scales

MATHPOWER™ *Seven*, pp. 216–217



Complete the chart.

	Measure on Map	Scale	Actual Measure
1.	4 cm	1:100	
2.	2.5 cm	1:500	
3.	15 cm	1:50	
4.	5.5 cm	1:10 000	
5.	5 cm	1:100 000	
6.	26 cm	1:2000	
7.	0.5 cm	1:4000	
8.	12.5 cm	1:1 000 000	

Use the map of Canada, above, to calculate the following distances by air.

9. Victoria to Regina

_____

10. Edmonton to Quebec City

_____

11. Charlottetown to Fredericton

_____

12. Calgary to Halifax

_____

13. Montreal to St. John's

_____

14. Calculate the distance between 2 of the cities on the map. Ask a classmate to determine the cities you used.

_____

Name _____

6.7 Rates

MATHPOWER™ *Seven*, pp. 222–223

A **rate** is a comparison of two quantities with different units.

A **unit rate** is a rate in which the second term is 1.

A group of Canadian and Russian explorers skied from Cape Arctic, Siberia, to Cape Columbia, Ellesmere Island. They skied 1770 km in 100 days.

Their rate of speed was $\frac{1770 \text{ km}}{100 \text{ days}}$. Their unit rate was $\frac{17.7 \text{ km}}{1 \text{ day}}$ or 17.7 km/day.

Complete the following.

1. 240 km in 3 h = _____ km/h

2. 72 players on 8 teams = _____ players/team

3. 16 cans in 2 boxes = _____ cans/box

4. $24 for 8 hamburgers = _____/hamburger

5. 360 words in 6 min = _____ words/min

6. 60 books in 5 boxes = _____ books/box

Write the unit rate for each.

7. $4.80 for 6 muffins _____

8. 56 pens in 7 boxes _____

9. 320 km in 4 h _____

10. $18.00 for 30 cans _____

11. 320 m in 40 s _____

12. At $10.50/h, how much can be earned in the following amounts of time?

a) a 7.5-h day _____

b) a 40-h week _____

13. At 80 km/h, how far can you travel in the times given below?

a) 3 h _____

b) 8.5 h _____

14. Tom paid $738.75 for a 5-night stay in a hotel. How much was the nightly rate?

_____

15. Grazina poured 8 equal glasses of lemonade from a 2-L pitcher. How many millilitres were in each glass?

_____

16. One season, Wayne Gretzky scored 92 goals in 80 NHL games. Express his scoring rate as a unit rate.

_____

17. A koala bear sleeps for 154 h/week. How many hours per day does the bear sleep?

_____

18. Maria jogs for 1 h every day and covers 42 km/week. Kim jogs for 1 h every Monday, Wednesday, and Friday, and covers 21 km/week.

a) At what speed does Maria jog in kilometres per hour?

_____

b) At what speed does Kim jog in kilometres per hour?

_____

c) Who jogs faster? _____

19. The baseball association bought 96 shirts for $1488.00. What was the cost of shirts for a team of 12 players?

_____

20. On a 14-h trip, the Peters drove 854 km. At that rate, how far had they travelled in 5.5 h?

_____

Name _____

6.8 Unit Pricing

MATHPOWER™ *Seven*, pp. 224–225

A **unit price** is the cost of one item or unit.

4 L of milk cost $3.68.

The unit price of the milk is 92¢/L.

Find the unit price for each. Round to the nearest cent.

1. 10 kg of potatoes cost $3.99

_____

2. 8 hotdog buns cost $1.49

_____

3. 24 cans of pop cost $8.99

_____

4. 3.5 kg of bananas cost $5.32

_____

5. 4 L of milk cost $4.99

_____

6. 5 grapefruit cost $1.99

_____

Which is the better value?

7. 3 cans of soup for $1.00 or 1 can for $0.35

_____

8. 100 mL of toothpaste for $1.79 or 75 mL for $1.39

_____

9. 800 g of cereal for $4.29 or 730 g for $4.49

_____

10. a 2-kg package of spaghetti for $3.29 or a 900-g package for $1.49

_____

11. Dimitri bought the following items before returning to school in September. Determine the unit price for each item to the nearest cent.

a) 10 pencils for $3.29 _____

b) 3 erasers for $1.98 _____

c) 4 binders for $23.96 _____

d) 12 markers for $10.68 _____

12. Ravi bought cheese from a delicatessen. How much did he pay for the following?

a) 350 g at $1.89/100 g _____

b) 200 g at $0.98/100 g _____

c) 250 g at $1.29/100 g _____

d) 450 g at $0.88/100 g _____

13. Find the price for 100 g of each of the following items.

a) 850 g of cheese at $8.99 _____

b) 500 g of coffee at $7.25 _____

c) 450 g of flour at $3.99 _____

d) 350 g of chicken at $3.85 _____

14. When a US dollar cost $1.23 Canadian, how much did US$400.00 cost?

_____

15. In the year that $50.00 Canadian bought 5250 Japanese yen, how many yen could you buy for a dollar?

_____

16. If McIntosh apples cost $2.49 for a 3-kg bag and $3.59 for a 5-kg bag, what is the lowest price you can pay for 15 kg of apples?

_____

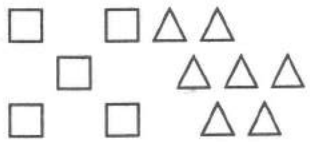
Name _____

Test One CHAPTER 6: Ratio and Rate

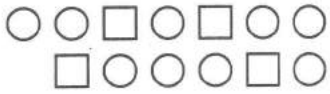
MATHPOWER™ *Seven*, pp. 201–229

Write the ratio.

1. squares to triangles _____



2. circles to squares _____



Write an equivalent ratio for each.

3. 6:8 _____

4. 2:3 _____

5. $\frac{12}{15}$ _____

Solve for the unknown in the following proportions.

6. 1:3 = n:18 n = _____

7. 2:5 = 12:n n = _____

8. $\frac{4}{n} = \frac{20}{35}$ n = _____

9. $\frac{n}{6} = \frac{16}{24}$ n = _____

10. An airplane travels 2700 km in 3 h. Find the rate of speed.

_____

11. There were 75 parents and 125 students at the school play.

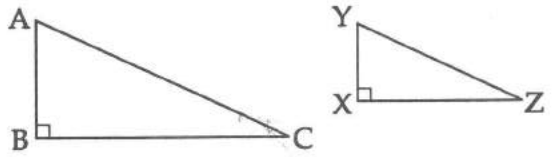
a) In lowest terms, find the ratio of students to parents.

_____

b) In lowest terms, find the ratio of parents to students.

_____

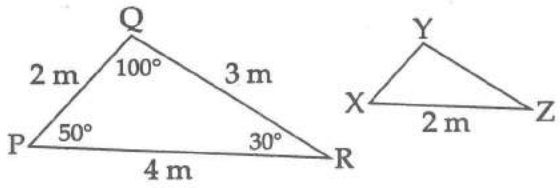
12. These triangles are similar. List the pairs of corresponding angles and corresponding sides.



_____

_____

13. The triangles are similar. Calculate the missing dimensions.



_____

_____

14. Mabel earned $32.25 for 5 h work on the weekend. What was her hourly rate of pay?

_____

15. Find the unit price for each.

a) 2 shirts for $22.00 _____

b) $26.97 for 3 cassette tapes

_____

16. The length of an insect in a drawing is 6 cm. The scale is 8:1. What is the length of the real insect?

_____

17. On a map, 1 cm represents 150 km. What is the actual distance between 2 towns that are 3 cm apart on the map?

_____

Name _____

Test Two CHAPTER 6: Ratio and Rate

MATHPOWER™ *Seven*, pp. 201–229

Write the ratio.

1. Xs to Os _____

X X O O O
O X O X

2. triangles to stars _____

Δ Δ ★
★ ★ ★ Δ

Write an equivalent ratio.

3. 12:3 _____

4. 2:7 _____

5. $\frac{5}{6}$ _____

6. $\frac{8}{3}$ _____

Solve for n in each proportion.

7. $\frac{5}{n} = \frac{20}{12}$ $n =$ _____

8. $\frac{2}{3} = \frac{n}{9}$ $n =$ _____

9. n:7 = 16:14 $n =$ _____

10. 4:1 = 32:n $n =$ _____

11. A collection of coins consists of 10 quarters, 8 dimes, and 6 nickels.

a) Find the ratio of quarters to nickels in lowest terms.

_____

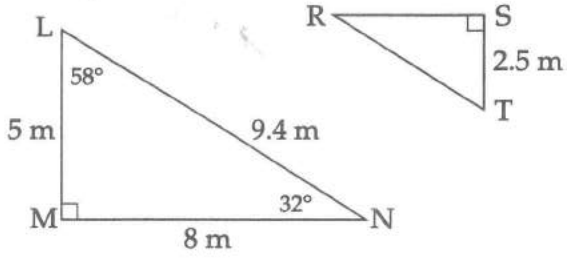
b) Find the ratio of dimes to all coins in lowest terms.

_____

12. Liam can type 150 words in 3 min. Find his rate of typing in words per min.

_____

13. The triangles are similar. Calculate the missing dimensions.



_____

_____

14. A 36-m high building casts a 15-m shadow when a tree standing next to the building casts a 5-m shadow. How tall is the tree?

_____

15. Find the unit price for each.

a) 6 muffins for $5.70 _____

b) 5 pens for $3.25 _____

16. Two places are 6 cm apart on a map. The scale of the map is 1:100 000. What is the actual distance between the 2 places in kilometres?

_____

17. The length of a cougar in a diagram is 7 cm. The scale is 1:30. What is the actual length of the cougar in metres?

_____

18. Helena earned $32.50 for working 5 h. Max earned $58.00 for working 8 h.

a) What does Helena earn per hour?

_____

b) What does Max earn per hour?

_____

c) Who earns more per hour and by how much?

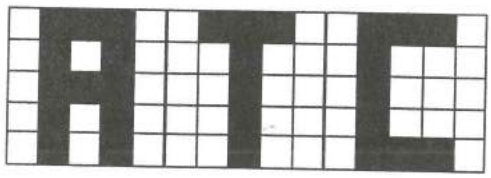
_____

Name _____

Extension CHAPTER 6: Ratio and Rate

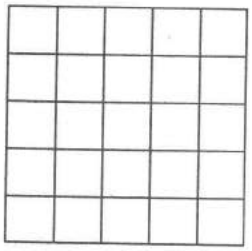
MATHPOWER™ *Seven*, pp. 201–229

1. a) For each 5 by 5 grid, write the ratio of shaded to unshaded squares for each letter of the alphabet.



i) _____ ii) _____ iii) _____

b) Shade a letter that gives a ratio of 10:15.



2. The ratio of prime numbers to composite numbers for the numbers 1 to 15 is 6:8. (The number 1 is neither prime nor composite.) Find the ratio of prime numbers to composite numbers for each of the following. Express each ratio in lowest terms.

a) 1 to 10 _____

b) 11 to 30 _____

c) 31 to 50 _____

d) 51 to 100 _____

3. Marie-Hélène had 36 coins in her bank, all quarters and dollar coins. The ratio of quarters to dollar coins is 5:4.

a) How many of each coin does she have?

_____

b) How much money does she have?

_____

4. An advertisement for toothpaste says that 4 out of 5 dentists recommend its use. How many of Canada's approximately 15 000 dentists recommend the product?

_____

5. Use the map to calculate the distance from Sudbury to each location.

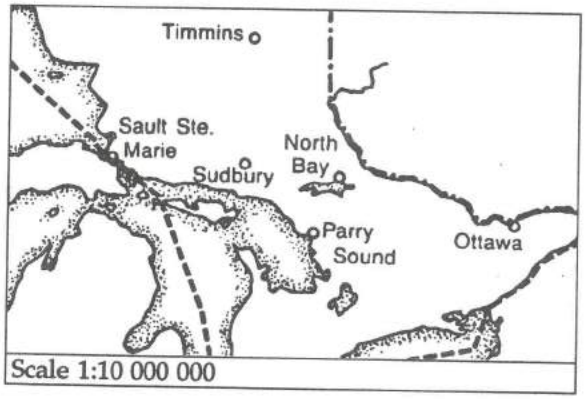
a) Sault Ste. Marie _____

b) Ottawa _____

c) Timmins _____

d) Parry Sound _____

e) North Bay _____



6. The side lengths in two similar triangles are in the ratio 3:2. One side of the smaller triangle has a length of 15 cm. What is the length of the corresponding side of the larger triangle?

_____

7. Marc Garneau became the first Canadian in space when he flew on the shuttle *Challenger* in 1984. The shuttle travelled about 5 500 000 km in 8 days. What was its speed to the nearest 100 km/h?

_____

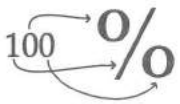
Name _____

7.1 Percent

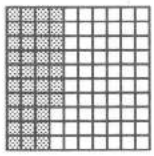
MATHPOWER™ *Seven*, pp. 236–237

Percent means "out of 100." To write a number as a percent, express it as a fraction with a denominator of 100.

$\frac{37}{100} = 13\%$



Express the shaded part of each figure as a percent.

1. 

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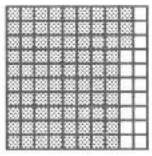
2. 

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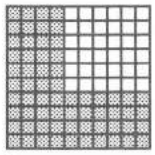
3. 

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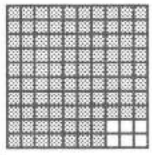
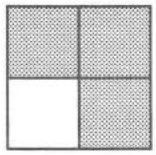
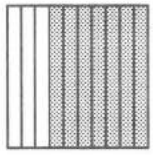
4. 

_____

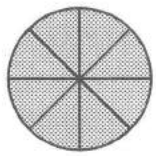
What percent of each figure is shaded?

5. 

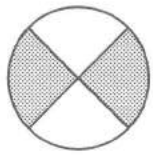
_____

6. 

_____

7. 

_____

8. 

_____

Write each fraction as a percent.

9. $\frac{37}{100}$ ____ **10.** $\frac{93}{100}$ ____ **11.** $\frac{58}{100}$ ____

12. $\frac{21}{100}$ ____ **13.** $\frac{54}{100}$ ____ **14.** $\frac{13}{100}$ ____

15. $\frac{17}{50}$ ____ **16.** $\frac{9}{10}$ ____ **17.** $\frac{3}{4}$ ____

18. $\frac{4}{5}$ ____ **19.** $\frac{13}{25}$ ____ **20.** $\frac{7}{20}$ ____

21. A ski club has 100 members. It recorded the following attendances at its weekly get-togethers. What percent of the members were absent from each get-together?

Week	Attendance (%)	Absences (%)
1	86	
2	82	
3	98	
4	91	
5	77	
6	94	

22. Ms. Wollinski teaches grade 7 math students in the morning and grade 8 math students in the afternoon. If 58% of her students are in grade 7, what percent of her students are in grade 8?

_____

Find each percent of a dollar. Write your answers in decimal form.

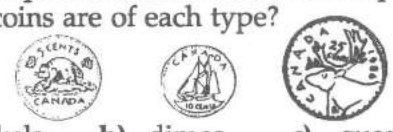
23. 29% _____ **24.** 32% _____ **25.** 4% _____

26. 73% _____ **27.** 65% _____ **28.** 88% _____

29. Celso saved 52%, 28%, 34%, 95%, 16%, and 63% of his allowance over 6 months. What was his average monthly saving?

_____

30. One hundred coins are laid end to end in the sequence shown below. What percent of the coins are of each type?



a) nickels _____ **b)** dimes _____ **c)** quarters _____

Name _____

7.2 Fractions and Decimals as Percents

MATHPOWER™ *Seven*, pp. 238–239

A fraction can be expressed as a percent by converting it to a fraction with a denominator of 100.

$$\frac{4}{5} = \frac{4 \times 20}{5 \times 20}$$
$$= \frac{80}{100}$$
$$= 80\%$$

A decimal can be expressed as a percent by multiplying it by 100.

$$0.33 = \frac{0.33}{1}$$
$$= \frac{0.33 \times 100}{1 \times 100}$$
$$= \frac{33}{100}$$
$$= 33\%$$

Complete the following.

1. $\frac{1}{2} = \frac{\square}{100} = \square\ \%$
2. $\frac{7}{10} = \frac{\square}{100} = \square\ \%$
3. $\frac{3}{5} = \frac{\square}{100} = \square\ \%$
4. $\frac{17}{25} = \frac{\square}{100} = \square\ \%$
5. $\frac{19}{50} = \frac{\square}{100} = \square\ \%$
6. $\frac{1}{20} = \frac{\square}{100} = \square\ \%$

Complete the following.

7. $0.56 = \frac{\square}{100} = \square\%$
8. $0.75 = \frac{\square}{100} = \square\%$
9. $0.03 = \frac{\square}{100} = \square\%$
10. $0.60 = \frac{\square}{100} = \square\%$
11. $0.61 = \frac{\square}{100} = \square\%$
12. $0.05 = \frac{\square}{100} = \square\%$

Write each decimal as a percent.

13. 0.2 _____
14. 0.07 _____
15. 0.035 _____
16. 0.45 _____
17. 0.84 _____
18. 0.685 _____

Insert >, <, or = to make each statement true.

19. $\frac{4}{5} \square$ 75%
20. 0.26 $\square$ 30%
21. 48% $\square$ 0.48
22. 0.7 $\square$ 7%
23. 66% $\square$ 0.68
24. $\frac{2}{5} \square$ 35%

Complete the following table.

	Decimal	Lowest Terms Fraction	Percent
25.		$\frac{3}{5}$	
26.	0.3		
27.		$\frac{3}{20}$	
28.	0.58		
29.		$\frac{19}{50}$	

30. Ovide saved $9.00 for every $15.00 he earned. What percent of money did he save?

_____

31. Ellen, Stephan, and Blake discussed their test marks. Stephan said that he answered 21 out of 25 questions correctly. Ellen said that she had 0.8 questions correct. Blake claimed to be 80% accurate.

a) Who had the highest test average?

_____

b) How many questions did each person answer correctly?

_____

32. About $\frac{1}{4}$ of the people in Canada live in Quebec. What percent of the population lives outside Quebec?

_____

33. About 0.275 of the Canadian population is aged 19 years or less. Express this decimal as a percent.

_____

Name _____

7.3 Percents as Fractions and Decimals

MATHPOWER™ *Seven*, pp. 240–241

Percents can be changed to fractions by writing them with a denominator of 100 and reducing to lowest terms.

$$48\% = \frac{48}{100}$$

$$= \frac{12}{25}$$

Percents can be changed to decimals by writing a fraction with a denominator of 100. Then divide the numerator by the denominator.

$$78\% = \frac{78}{100}$$

$$= 0.78$$

Write each percent as a fraction in lowest terms.

1. 15% _____ **2.** 36% _____

3. 44% _____ **4.** 45% _____

5. 8% _____ **6.** 60% _____

Write each percent as a decimal.

7. 16% _____ **8.** 48% _____

9. 3% _____ **10.** 30% _____

11. 5% _____ **12.** 15% _____

Write each percent as a decimal and as a fraction in lowest terms.

13. 14% _____ _____ **14.** 82% _____ _____

15. 10% _____ _____ **16.** 66% _____ _____

17. 75% _____ _____ **18.** 90% _____ _____

Complete the chart.

	Percent	Decimal	Fraction in Lowest Terms
19.	33%		
20.	4%		
21.	32%		
22.	11%		
23.	95%		

Insert <, >, or = to make each statement true.

24. 24% ☐ $\frac{6}{25}$ **25.** 0.59 ☐ 60%

26. 10% ☐ 0.01 **27.** $\frac{11}{20}$ ☐ 50%

28. 2% ☐ $\frac{1}{50}$ **29.** 0.39 ☐ 38%

Express each of the following percents as a fraction in lowest terms and as a decimal.

30. About 15% of the people living in Canada were born outside Canada.

_____

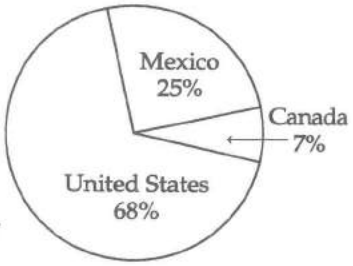
31. Montreal, Quebec, gets about 80% as much sunshine as Estevan, Saskatchewan.

_____

32. About 2% of the people in Canada live in Newfoundland and Labrador.

_____

The North American Free Trade Agreement includes Canada, the United States, and Mexico. The circle graph shows the percent of the total population that lives in each of the three countries.



33. Express each percent as a decimal.

_____

34. Express each percent as a fraction in lowest terms.

_____

35. What fraction of the total population lives in Canada or the United States? Write your answer in lowest terms.

_____

36. What fraction of the total population does not live in the United States? Write your answer in lowest terms.

_____

Name _____

7.4 Finding a Percent of a Number

MATHPOWER™ *Seven*, pp. 242–243

To find a percent of a number, write the percent as a decimal or a fraction and then multiply by the number.

$55\% = \frac{55}{100}$

$= 0.55$

55% of 150 $= 0.55 \times 150$

$= 8.25$

Write each percent as a fraction and as a decimal.

1. 36% _____ _____

2. 68% _____ _____

3. 8% _____ _____

4. 80% _____ _____

5. 14% _____ _____

6. 42% _____ _____

7. 2% _____ _____

8. 70% _____ _____

9. 89% _____ _____

Calculate the percent of each number.

10. 25% of 40 _____

11. 10% of 250 _____

12. 90% of 12 _____

13. 7% of 40 _____

14. 3% of 340 _____

15. 85% of 30 _____

Calculate each percent in dollars and cents.

16. 10% of \$325.00 _____

17. 2% of \$66.00 _____

18. 25% of \$13.00 _____

19. 72% of \$750.00 _____

20. 30% of \$18.30 _____

21. 95% of \$5.00 _____

22. Sam's basketball team won 70% of the 30 games they played. How many games did they win?

_____

Calculate to the nearest cent.

23. 19% of \$39.17 _____

24. 43% of \$18.04 _____

25. 7% of \$31.00 _____

26. 75% of \$53.89 _____

27. 96% of \$103.83 _____

28. 54% of \$66.98 _____

There are 625 students in the school. Complete the chart to show how many travel to school by each type of travel.

	Type of Travel	Students (%)	Number of Students
29.	Bus	20	
30.	Car	12	
31.	Cycle	4	
32.	Walk	64	

An apple is composed of 80% water. How much water is contained in apples with these masses?

33. 280 g _____

34. 160 g _____

35. 305 g _____

36. 200 g _____

37. Ms. Quan spends 15% of every 8-h work day at lunch 5 days per week.

a) How much time does she spend at lunch each week?

_____

b) How many minutes does she have for lunch each day?

_____

Name _____

7.5 Estimating with Percent: Mental Math

MATHPOWER™ *Seven*, pp. 244–245

To estimate a percent from a fraction, round the numerator and denominator to values that are easy to work with.

$\frac{47}{195}$ is about $\frac{50}{200}$

$\frac{50}{200} = \frac{25}{100}$

$= 25\%$

To estimate a percent of a number, again round to convenient values.

19% of 49 is about 20% or $\frac{1}{5}$ of 50

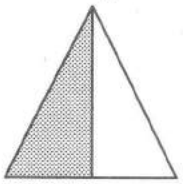
$\frac{1}{5} \times 50 = 10$

52% of \$39.75 is about 50% or 0.5 of \$40

$0.5 \times \$40 = \$20$

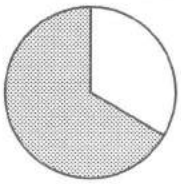
Estimate the percent of each area that is shaded.

1.



_____

2.

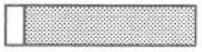


_____

3.

_____

4.



_____

Estimate the percent of each number.

5. 25% of 80

_____

6. 30% of 150

_____

7. 75% of 300

_____

8. 10% of 145

_____

9. 45% of 96

_____

10. 18% of 520

_____

Estimate the percent of each amount.

11. 22% of \$60.00

_____

12. 38% of \$80.00

_____

13. 9% of \$205.00

_____

14. 65% of \$31.00

_____

15. 74% of \$21.00

_____

16. 48% of \$181.00

_____

Estimate the percent for each test score.

17. 22 out of 52

_____

18. 43 out of 61

_____

19. 11 out of 15

_____

20. 69 out of 78

_____

21. 19 out of 25

_____

22. 34 out of 40

_____

23. The area of Prince Edward Island is 5657 km^2. The area of Nova Scotia is 55 491 km^2. Estimate the percent that Prince Edward Island's area is of Nova Scotia's area.

_____

24. The area of Lake Superior is about 82 000 km^2. Estimate the percent that Prince Edwards Island's area is of Lake Superior's area.

_____

25. Newfoundland joined Canada in 1949. Estimate the percent that your age is of the time since Newfoundland joined Canada.

_____

The taxes and tip add up to 35% to the amount of a restaurant bill. Estimate the most that the taxes and tip might add to the following bills.

26. \$42.00

_____

27. \$8.45

_____

28. \$109.00

_____

29. \$35.00

_____

30. \$19.25

_____

31. \$64.50

_____

Name _____

7.6 Finding the Percent

MATHPOWER™ *Seven*, pp. 246–247

To find a percent using a fraction, express the denominator as 100 or divide the numerator by the denominator.

$\frac{19}{25} = \frac{19 \times 4}{25 \times 4} = \frac{76}{100} = 76\%$

$\frac{151}{200} = \frac{151 \div 2}{200 \div 2} = \frac{75.5}{100} = 75.5\%$

$\frac{3}{8} = 0.375 = 37.5\%$

Express each fraction as a percent.

1. $\frac{1}{2}$ _____

2. $\frac{3}{20}$ _____

3. $\frac{2}{5}$ _____

4. $\frac{5}{8}$ _____

5. $\frac{11}{40}$ _____

6. $\frac{27}{45}$ _____

What percent of the first number is the second number?

7. 400, 160 _____

8. 550, 137.5 _____

9. 75, 11.25 _____

10. 112, 14.56 _____

11. 15, 5.7 _____

12. 500, 400 _____

13. 30, 21.9 _____

14. 200, 38 _____

15. The neighbourhood hockey team won 72 out of 120 games and tied 4 games.

a) What percent of their games did the hockey team win?

_____

b) To the nearest percent, what percent of their games did the hockey team lose?

_____

c) To the nearest percent, what percent of their games did the hockey team tie?

_____

16. Martina completed 48 of the 50 questions on her last mathematics test. She answered 36 questions correctly.

a) What percent will her mark be if the test is graded out of 50?

_____

b) What percent will her mark be if the test is graded out of the number of questions completed?

_____

17. When Yuri was a baby, he measured 60 cm long and had a mass of 4.5 kg. Yuri is 12 years old now. He measures 150 cm and is 60 kg.

a) What percent of Yuri's present height was his height as a baby?

_____

b) What percent of Yuri's present mass was his mass as a baby?

_____

18. Mr. Culver's mathematics class has worked through 246 pages of their mathematics textbook. Of the 482 pages in the book, 15 pages make up the table of contents and the index.

a) Approximately, what percent of the entire textbook has the class completed?

_____

b) About what percent of the textbook has not yet been covered, excluding the table of contents and the index?

_____

Name _____

7.7 Percents Greater Than 100%

MATHPOWER™ *Seven*, p. 250

Percents that are greater than 100% are numbers that are greater than 1. To express this type of percent as a fraction or decimal, divide this percent by 100.

$100\% = \frac{100}{100}$ or 1

$175\% = \frac{175}{100}$ or 1.75

$250\% = \frac{250}{100}$ or 2.5

150 of 150 $= \frac{150}{150}$ or 100%

585 of 195 $= \frac{585}{195}$ or 300%

660 of 120 $= \frac{660}{120}$ or 550%

225% of \$15.00 = 2.25 × \$15.00
= \$33.75

Write each percent as a decimal.

1. 131% **2.** 113% **3.** 287%

4. 1100% **5.** 375% **6.** 165%

7. 472% **8.** 5000% **9.** 730%

Find.

10. 150% of 90 **11.** 350% of 80

12. 900% of 54 **13.** 1000% of 210

14. 230% of 75 **15.** 208% of 140

16. 190% of 84 **17.** 107% of 70

Express as a percent.

18. 140 of 100 **19.** 300 of 60

20. 160 of 80 **21.** 525 of 25

Find.

22. 115% of 25 **23.** 270% of 18

24. 590% of 20 **25.** 725% of 50

26. The rent on the Cormiers' apartment is 103% of last year's rent. If they paid \$849.00 last year, what is their rent this year?

27. A hair conditioner is on sale. You can buy 500 mL for the cost of 350 mL. To the nearest percent, what percent of the regular volume is the sale volume for this conditioner?

28. The population of Gatineau, Quebec, increased from 18 000 to 92 000 in 25 years. To the nearest percent, what percent was the new population of the old population?

29. To the nearest percent, what percent is your present age of your age a year ago?

Name _____

7.8 Simple Interest
7.9 Discount and Sale Price

MATHPOWER™ *Seven*, pp. 251–252

Interest is an amount paid on money borrowed or invested.

A **discount** is a reduction in the cost of an item.

The **sale price** of an item is its regular price minus the discount.

Calculate the amount of interest on each deposit for one year.

1. $500.00 at 7% _____

2. $900.00 at 3% _____

3. $2500.00 at 4% _____

4. $5800.00 at 10% _____

5. $859.00 at 5% _____

6. $348.00 at 6% _____

Complete the table.

	Amount Borrowed ($)	Interest Rate (%)	Interest Owed ($)	Total Owed ($)
7.	175.00	10		
8.	2750.00	13		
9.	460.00	11		
10.	7139.00	14		
11.	1123.00	12		

12. Mariko deposited $750.00 in a savings account that earned 8% interest per year. How much interest did the money earn in a year?

_____

13. Karl saved $915.34 last year. Karl deposited it for one year in an account that paid 4% interest. How much money did Karl have in his bank account at the end of the year?

_____

14. Nathan has a $1500.00 savings bond. It earns 11% per year. How much will the savings bond be worth at the end of the year?

_____

15. Which deposit earns more interest, $250.00 at 6% per year or $400.00 at 4% per year?

_____

Complete the table.

	Regular Price ($)	Discount ($)	Sale Price ($)
16.	14.99	1.50	
17.		5.85	33.15
18.	119.99		71.99

Calculate the discount and the sale price for each of the following items.

19. 15% off a sweatshirt at $39.95

_____ _____

20. 25% off a camera at $249.99

_____ _____

21. 30% off a cake at $18.45

_____ _____

22. 20% off a pair of jeans at $59.00

_____ _____

23. 35% off a car at $10 995.00

_____ _____

24. The Fitness Store is selling an exercise bike for 20% off the regular price of $249.99. The Bike Barn is selling the same exercise bike for 25% off its regular price of $269.99.

a) What is the sale price at the Fitness Store?

_____

b) What is the sale price at the Bike Barn?

_____

c) Which store has the lower price and by how much?

_____

Name _____

7.10 Goods and Services Tax (GST)
7.11 Provincial Sales Tax (PST)

MATHPOWER™ *Seven*, pp. 253–254

The Provincial Sales Tax (PST) is a percent determined by each province. It is, in some provinces, calculated on the selling price only. In other provinces, the PST is calculated on the sum of the selling price and the Goods and Services Tax (GST). The GST percent in 1993 was 7%.

PST found from the selling price

Selling price	$ 95.00
GST (7%)	6.65
PST (8%)	7.60
Total cost:	$109.25

PST found from the selling price + GST

Selling price	$ 95.00
GST (7%)	6.65
Subtotal	$101.65
PST (8%)	8.13
Total cost:	$109.78

Use the present GST rate to estimate the amount of GST on each item.

	Item	Price ($)	Estimated GST ($)
1.	Textbook	32.50	
2.	Cassette Tape	8.99	
3.	Computer Software	319.00	
4.	Computer	1849.00	
5.	Encyclopedia	199.99	
6.	Magazine	3.50	

Use the present GST rate to calculate the amount of GST and the total cost of each item.

	Item	Price ($)	GST ($)	Cost Including GST ($)
7.	Compact Disc	19.99		
8.	Alarm Clock	35.50		
9.	Bicycle	369.00		
10.	Breath Mints	0.89		
11.	Stereo	949.99		

12. How much more GST do you pay on a $350.00 item than on a $200.00 item?

_____

13. How much do you save on a $489.00 item when a store advertises that it will pay the GST?

_____

For each item, estimate the total GST and PST in your province.

	Item	Price ($)	Estimated GST + PST ($)
14.	Shampoo	4.49	
15.	Car	25 000.00	
16.	Shirt	45.00	
17.	Computer Disks	19.99	
18.	Plane Ticket	625.00	

Calculate the total cost for each of the items shown below. Use the sales tax in your province and the method your province uses to calculate the PST.

19. book; $8.50 GST _____

PST _____ Total Cost _____

20. computer; $1200.00 GST _____

PST _____ Total Cost _____

21. radio; $79.95 GST _____

PST _____ Total Cost _____

22. car; $15 539.00 GST _____

PST _____ Total Cost _____

Name _____

7.12 Commission

MATHPOWER™ *Seven*, p. 255

The **commission** on an item is the percent of the selling price that a salesperson earns when he or she sells the item.

Selling price = $15 095.00

Commission rate = 4%

Commission amount = $15 095.00 × 0.04 = $603.80

Estimate.

1. 5% of $350.00 _____

2. 8% of $2050.00 _____

3. 15% of $845.00 _____

4. 9% of $19 000.00 _____

5. 3% of $480.00 _____

6. 12% of $1400.00 _____

7. 4% of $950.00 _____

8. 5% of $14 800.00 _____

Calculate the commission for each of the following sales.

9. $3500.00 at 3% _____

10. $11 400.00 at 5% _____

11. $2850.00 at 6% _____

12. $9879.00 at 2% _____

13. $349.00 at 4% _____

14. $1500.00 at 8% _____

15. $855.00 at 9% _____

16. $8450.00 at 12% _____

17. $4560.00 at 11% _____

18. $638.00 at 15% _____

19. Igor paid 6% commission to the real estate agent who sold his house for $189 000.00. How much did Igor pay in commission?

_____

20. Lai earned 8% commission on the furniture she sold. How much commission did she make in a week when she sold $8750.00 worth of furniture?

_____

21. Samantha earns $75.00 plus 15% of sales when she sells over $250.00 of merchandise in her mail order business. How much commission did Samantha earn when she sold $495.00 of merchandise?

_____

22. When Don was hired to work in a computer store, he was given a choice of how he wanted to be paid. He chose a salary of $400.00 per week and turned down a commission of 6% of his sales. In his first week, Don sold $8000.00 worth of equipment.

a) How much would he have earned in commission?

_____

b) What was the difference between his salary and the amount of commission he would have earned?

_____

23. Suppose you accept a job in textbook sales. You are expected to sell $900 000.00 worth of textbooks in your first year.

a) Would you be better off if you agreed to a commission of 5% of your sales, or a salary of $30 000.00 plus 2% of your sales?

_____

b) How much better off?

_____

Name _____

Test One CHAPTER 7: Percent

MATHPOWER™ *Seven*, pp. 231–261

Complete the chart.

	Fraction	Decimal	Percent
1.		0.04	
2.	$\frac{17}{25}$		
3.			80%
4.	$\frac{7}{20}$		
5.			3%
6.		0.9	

Calculate.

7. 15% of 140

_____

8. 10% of 130

_____

9. 75% of 200

_____

10. 30% of 390

_____

Write the first number as a percent of the second number.

11. 30, 15

_____

12. 6, 24

_____

13. 140, 1000

_____

14. 19, 40

_____

Complete the chart.

	Loan Amount ($)	Interest Rate (%)	Interest Owed ($)	Total Owed ($)
15.	750.00	11		
16.	625.00	13		
17.	1500.00	15		
18.	520.00	12		
19.	990.00	10		
20.	475.00	14		

Calculate the amount of interest at 5% on each investment for one year.

21. $3500.00

_____

22. $545.00

_____

23. $999.00

_____

24. $135.00

_____

A sporting goods shop had an end-of-season sale. It reduced all its summer equipment prices by 40%. Calculate the discount and the sale price for each of the following items.

25. 12-speed bicycle $114.98

Discount _____

Sale Price _____

26. tennis racket $285.00

Discount _____

Sale Price _____

27. set of golf clubs $229.98

Discount _____

Sale Price _____

28. 6-person tent $124.77

Discount _____

Sale Price _____

29. Paulo got 48 out of 70 on his first French test. He got 59 out of 80 on his second test. Approximately, by what percent did Paulo improve his mark on the second test?

_____

30. Eva works on commission at a local department store. She earns 3% on her sales. How much did she earn when she sold a television for $379.00?

_____

31. Roberta earned $5.35/h when she started to work at a restaurant on weekends. She now earns $7.20/h. What is her present rate as a percent of her original rate? Express your answer to the nearest percent.

_____

32. Find the GST on a $350.00 cassette deck.

_____

33. Calculate the GST and the PST on a $149.00 jacket.

_____

Name _____

Test Two CHAPTER 7: Percent

MATHPOWER™ *Seven*, pp. 231–261

Write each fraction as a percent.

1. $\frac{3}{5}$ _____ **2.** $\frac{3}{4}$ _____ **3.** $\frac{13}{25}$ _____

4. $\frac{27}{50}$ _____ **5.** $\frac{7}{8}$ _____ **6.** $\frac{31}{40}$ _____

Write each percent as a fraction in lowest terms.

7. 52% _____ **8.** 55% _____ **9.** 4% _____

10. 84% _____ **11.** 67.5% _____ **12.** 42.5% _____

Write each decimal as a percent.

13. 0.01 _____ **14.** 0.61 _____ **15.** 0.7 _____

16. 0.35 _____ **17.** 1.19 _____ **18.** 4.25 _____

Calculate the amount earned on each of these investments if the interest rate is 6%.

19. $325.00 _____ **20.** $670.00 _____

21. $1283.00 _____ **22.** $11 802.00 _____

23. Galia earned $45 000.00 last year. She saved 33% of her earnings and deposited the money for a year at 7%.

a) How much did Galia deposit?

_____

b) How much will she have saved after one year?

_____

24. Kate borrowed $2150.00 to take a trip to Japan. She paid 11% interest on the loan. How much did she have to pay altogether?

_____

25. Murray bought the following items.

Espresso coffee maker	$189.95
Set of 4 espresso cups	$29.95
Set of 4 demitasse spoons	$49.95

a) How much GST would Murray pay?

_____

b) How much PST would Murray pay in your province for the above items?

_____

c) What would the total cost be in your province for the above items?

_____

26. Oskar has driven 182 km of a 500-km trip. What percent, to the nearest percent, of the journey does he still have to drive?

_____

27. Aleta and Mohammed bought an old bicycle for $15.00. They repaired it and sold it for $65.00. What was their selling price, to the nearest tenth of a percent, as a percent of their buying price?

_____

A salesperson at a local furniture store earns $325.00 per week plus 2% of the total sales. Calculate the total weekly salary for the following amounts of sales.

28. $4345.00 _____ **29.** $3802.00 _____

30. $4052.00 _____ **31.** $6581.00 _____

32. $9080.00 _____ **33.** $1015.00 _____

Name _____

Extension CHAPTER 7: Percent

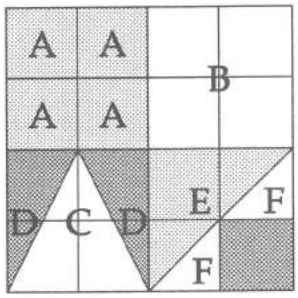
MATHPOWER™ *Seven*, pp. 231–261

What percent of the large square is each of the following areas?

1. A _____ **2.** B _____

3. C _____ **4.** D _____

5. E _____ **6.** F _____



Express each fraction as a percent to 2 decimal places.

7. $\frac{2}{11}$ _____ **8.** $\frac{3}{9}$ _____ **9.** $\frac{7}{24}$ _____

10. $\frac{3}{8}$ _____ **11.** $\frac{15}{16}$ _____ **12.** $\frac{5}{7}$ _____

Calculate to the nearest tenth.

13. 9% of 86 _____ **14.** 15% of 225 _____

15. 39% of 222 _____ **16.** 75% of 38.2 _____

17. 25% of 625 _____ **18.** 18% of 54 _____

19. 4% of 12 _____ **20.** 51% of 124 _____

21. In a recent survey of 1050 families, 38.5% said they owned a compact disc player. Approximately, how many families in this survey own a compact disc player?

_____

22. In Central School, 358 of the 520 students each lunch at school. Approximately, what percent of the students leave the school for lunch?

_____

Calculate the amount of interest on each investment for one year.

23. \$475.00 at 4% _____ **24.** \$630.00 at 6% _____

25. \$1100.00 at 7% _____ **26.** \$159.00 at 3% _____

27. \$935.00 at 8% _____ **28.** \$1370.00 at 5% _____

29. Owen was offered \$225.00 per week plus 3% commission on sales, or 15% of sales with no salary. How much must he sell before the second method of payment gives him the higher pay? Express your answer to the nearest dollar.

_____

30. Noreen bought a dress for \$275.00. Later that month, Beth bought the same dress on sale at 25% off. The sales tax in their province was 6%, the GST was 7%, and PST was calculated on only the selling price.

a) What was Noreen's total cost? _____

b) What was Beth's total cost? _____

c) How much did Beth save by buying the dress on sale?

_____

31. Morrison's Clothing store is advertising a 30% discount on its shirts. Which shirt has the incorrect sale price? Calculate the correct sale price.

Shirt A	**Shirt B**
Was: \$54.99	Was: \$38.95
Now: \$38.49	Now: \$11.68

_____

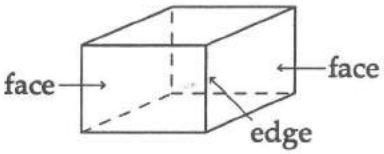
_____

Name _____

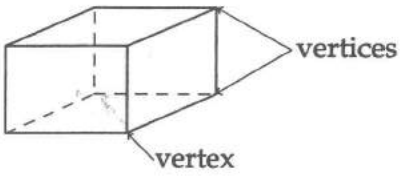
8.1 Three-Dimensional Figures

MATHPOWER™ *Seven*, pp. 266–267

In a three-dimensional figure, an **edge** is a line segment at which two **faces** meet.



In a three-dimensional figure, a **vertex** is a point at which three or more edges meet.



State the total number of faces on each of the following three-dimensional figures.

1. cube _____
2. square pyramid _____
3. rectangular prism _____
4. triangular pyramid _____
5. pentagonal prism _____
6. hexagonal prism _____
7. pentagonal pyramid _____
8. hexagonal pyramid _____
9. triangular prism _____
10. rectangular pyramid _____

State the number of rectangular faces on each of the following three-dimensional figures.

11. triangular prism _____
12. pentagonal prism _____
13. hexagonal prism _____
14. triangular pyramid _____
15. Name 3 three-dimensional figures that have fewer than 3 edges.

_____

_____

_____

State the number of square faces on each of the following three-dimensional figures.

16. square pyramid _____
17. cylinder _____
18. triangular pyramid _____
19. cube _____

Name a three-dimensional figure with each of the following numbers of edges.

20. 6 _____
21. 9 _____
22. 2 _____
23. 12 _____
24. 8 _____
25. 15 _____
26. Name 2 three-dimensional figures that each have 6 vertices.

_____

_____

27. Name 2 three-dimensional figures that have equal numbers of faces, equal numbers of edges, and equal numbers of vertices.

_____

_____

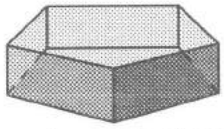
Name _____

8.2 Identifying and Classifying Polyhedra

MATHPOWER™ *Seven*, pp. 268–269

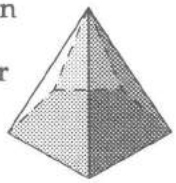
Polyhedra are three-dimensional figures with flat faces.

A **prism** is a polyhedron with 2 parallel, congruent bases joined by the same number of parallelograms as there are sides on each base.



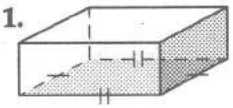
pentagonal prism

A **pyramid** is a polyhedron that has one base and the same number of triangular faces as there are sides on the face.

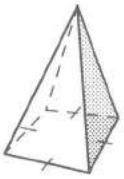


pentagonal pyramid

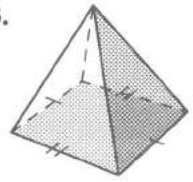
Name the following polyhedra.

1. 

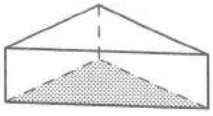
_____

2. 

_____

3. 

_____

4. 

_____

Complete each of the following statements.

5. The shape of each face of a rectangular prism is a(n) _____.

6. Faces of a prism or a pyramid meet at a(n) _____.

7. Edges of a prism or a pyramid meet at a(n) _____.

8. A prism or a pyramid is named by its _____.

Name the polyhedron with the following characteristics.

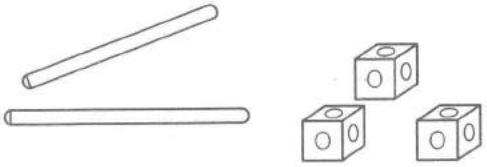
9. 5 congruent triangles

_____

10. 2 congruent triangles

_____

Paul can build structures with rods and blocks similar to those shown below. He uses the rods as edges and the blocks as vertices. Complete the following table to show how many rods and blocks he needs to build each polyhedron.



	Polyhedron	Rods	Blocks
11.	Square Pyramid		
12.	Square Prism		
13.	Pentagonal Pyramid		
14.	Rectangular Pyramid		
15.	Triangular Prism		
16.	Pentagonal Prism		

Name the polyhedron that is constructed using the following faces.

17. 2 triangles and 3 rectangles

_____

18. 1 pentagon and 5 triangles

_____

Name the polyhedron suggested by each of the following shapes.

19. a tent _____

20. a freezer _____

Name _____

8.3 Solids, Shells, and Skeletons
8.4 Planes of Symmetry

MATHPOWER™ *Seven*, pp. 270–271

A **solid** is a three-dimensional object whose interior is completely filled.

A **shell** is a three-dimensional object whose interior is empty.

A **skeleton** is a representation of the edges of a three-dimensional object.

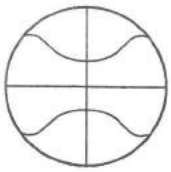
A **plane of symmetry** divides an object into 2 congruent parts.

Identify each object as a solid, a shell, or a skeleton.

1. an orange _____
2. a shoe box _____
3. scaffolding _____
4. a basketball _____
5. a tent _____
6. a cake _____

Show any planes of symmetry on each object.

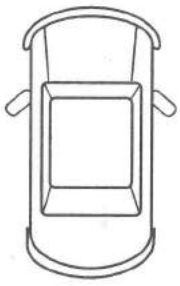
7.



8.

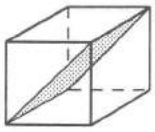
9.

10.

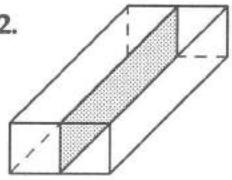


State whether each shaded region is a plane of symmetry.

11.

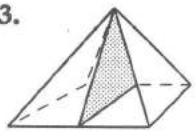


12.

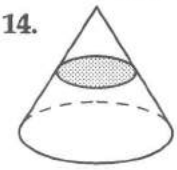


_____ _____

13.



14.



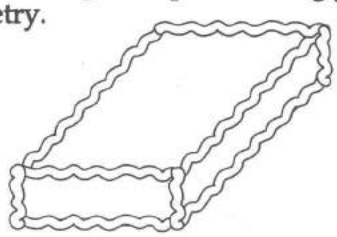
_____ _____

15. Lucia wants to cut a block of wood into 2 congruent rectangular pieces. List the possible dimensions of each cut piece.

_____

_____

16. Show how Ramon can cut his birthday cake into 16 congruent pieces using planes of symmetry.

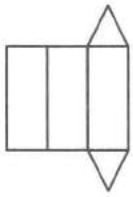


Name _____

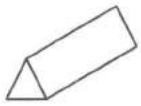
8.5 Nets of Polyhedra

MATHPOWER™ *Seven*, pp. 274–275

A pattern that can be folded to form a polyhedron is called a **net**.

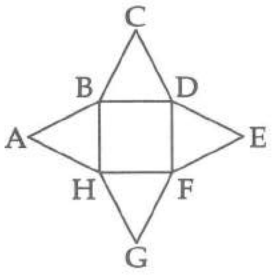


The figure shows the net of a triangular prism.



Name the polyhedron formed from each net. List the edges that are joined when the net is assembled.

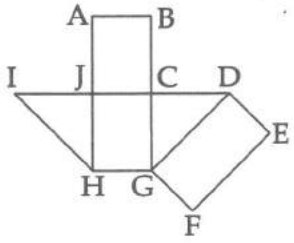
1.



_____

_____

2.



_____

_____

Draw a net of each of the following polyhedra.

3. hexagonal pyramid

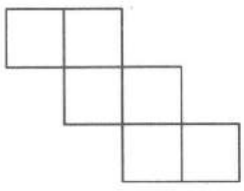
4. rectangular prism

5. Draw 2 nets for a triangular pyramid.

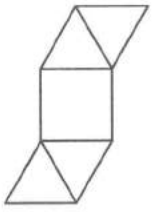
6. Draw a net of a die. Mark the dots on the faces. Make sure that the correct faces will be opposite each other when the die is assembled.

7. Which of the following nets can be folded into a polyhedron? Name each polyhedron.

a)



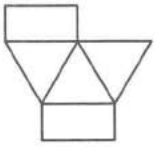
b)



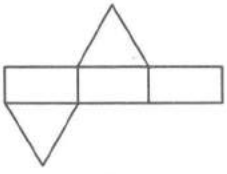
_____ _____

_____ _____

c)



d)



_____ _____

_____ _____

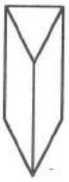
Name _____

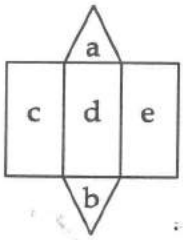
8.6 Surface Area

MATHPOWER™ *Seven*, pp. 276–277

The **surface area** of a three-dimensional figure is the sum of the areas of all its faces.

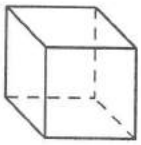
surface area = areas of a + b + c + d + e





Draw the net of each figure. Then, calculate the surface area.

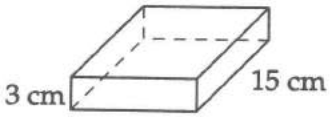
1.



cube

_____

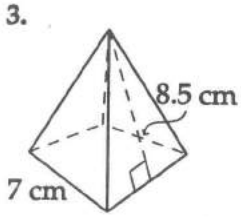
2.



rectangular prism

_____

3.

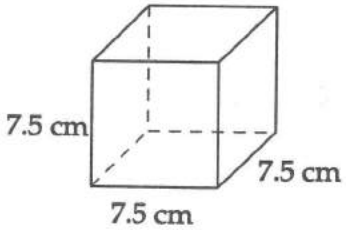


square pyramid

_____

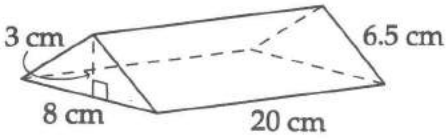
Calculate the surface area.

4.



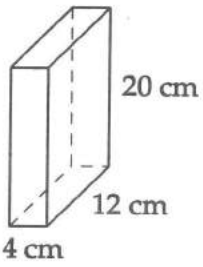
_____

5.



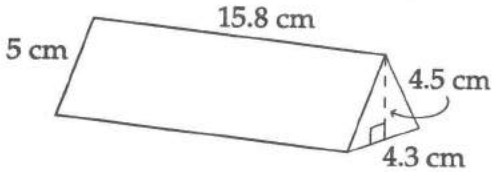
_____

6.



_____

7. The garage roof is shingled on 4 sides. What area is covered with shingles?



_____

8. A cereal box is 28.5 cm by 24 cm by 7 cm. What area of cardboard makes up the container's surface?

_____

9. A cube has 5-cm edges. The edges of a rectangular prism have lengths of 3 cm, 5 cm, and 7 cm. Which polyhedron has the greater surface area and by how much?

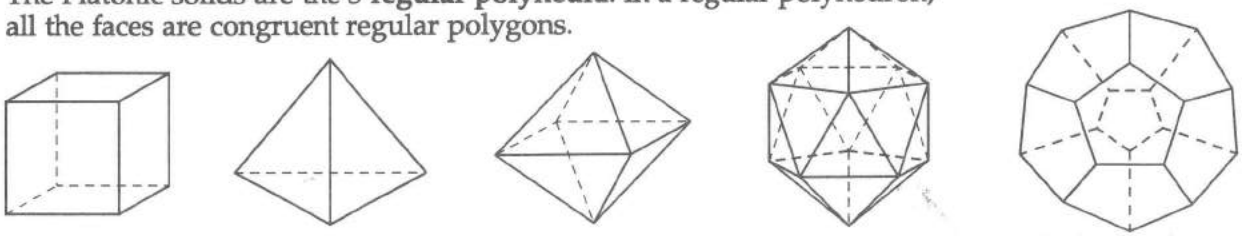
_____

Name _____

8.7 Regular Polyhedra: The Platonic Solids

MATHPOWER™ *Seven*, pp. 278–279

The Platonic solids are the 5 **regular polyhedra**. In a regular polyhedron, all the faces are congruent regular polygons.



cube tetrahedron octahedron icosahedron dodecahedron

For each of the Platonic solids, how many times greater is the total surface area than the area of each face?

1. cube _____

2. tetrahedron _____

3. dodecahedron _____

4. icosahedron _____

5. octahedron _____

Complete the table by finding the numbers of edges and vertices for each Platonic solid.

	Platonic Solid	Number of Edges	Number of Vertices
6.	Cube		
7.	Tetrahedron		
8.	Dodecahedron		
9.	Icosahedron		
10.	Octahedron		

11. A tetrahedron is made from 4 equilateral triangles. If a polyhedron is made from 4 triangles that are not equilateral, what is the polyhedron called?

_____

12. How many times more equilateral triangles are there in an icosahedron than in a tetrahedron?

_____

13. How many times more pentagons are there in a dodecahedron than in a pentagonal prism?

_____

14. The faces of a tetrahedron, an octahedron, and an icosahedron are congruent. What is the ratio, in lowest terms, of the surface areas of

a) the tetrahedron to the octahedron?

_____

b) the tetrahedron to the icosahedron?

_____

c) the octahedron to the icosahedron?

_____

15. The area of 1 face of a dodecahedron is 5.4 cm^2. What is the surface area of the dodecahedron?

_____

Name _____

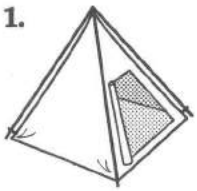
8.8 Perspectives of Objects

MATHPOWER™ *Seven*, pp. 280–281

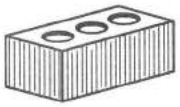
Three-dimensional objects can be viewed from several different directions.
Each point of view is called a **perspective**.

Draw a front view, side view, and top view of each object.

1.



2.



3.

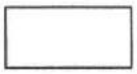
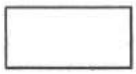
The diagrams show the top view, side view, and front view of the same object. Name each polyhedron.

4.



_____

5.

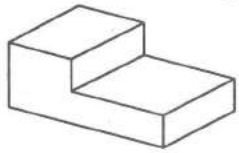

_____

6.



_____

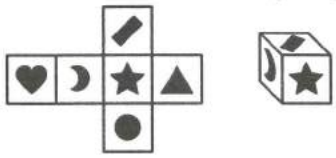
7. Draw the solid from each perspective.



a) the front **b)** above

c) below **d)** the side

8. The diagrams show the net of a cube and a view of the cube from one perspective.



Draw the cube in this position viewed from

a) the top. **b)** below.

c) the right. **d)** the back.

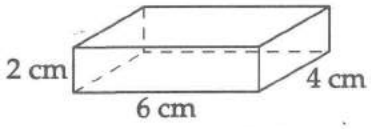
Name _____

8.9 Volumes of Prisms

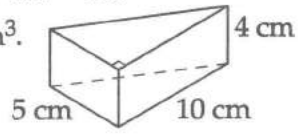
MATHPOWER™ *Seven*, pp. 284–285

The **volume of a prism** is the area of the base times its height.

Area of base $6 \times 4 = 24$
Volume $24 \times 2 = 48$
The volume is 48 cm^3.

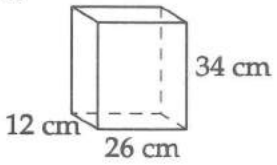


Area of base $\frac{1}{2} \times 5 \times 10 = 25$
Volume $25 \times 4 = 100$
The volume is 100 cm^3.



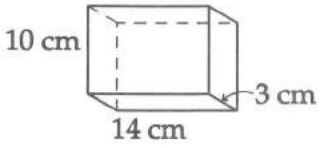
Calculate the volume of each rectangular prism.

1.



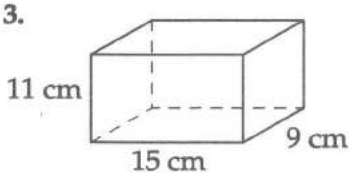
_____

2.



_____

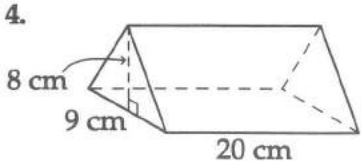
3.



_____

Calculate the volume of each triangular prism.

4.



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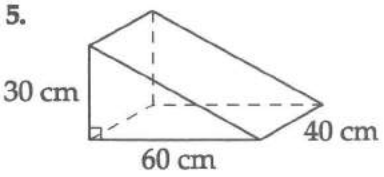
5.



_____

Calculate the volumes of cubes with edges of the following lengths.

6. 7 cm _____

7. 22 cm _____

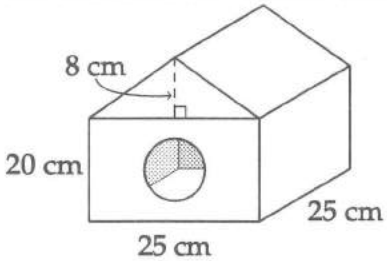
8. 9.5 cm _____

9. 12.6 cm _____

Complete the chart.

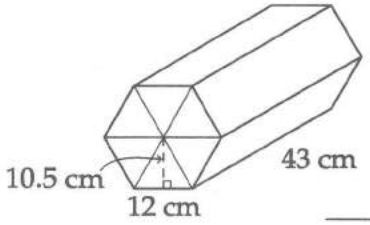
	Triangular Base		Prism Height	Prism Volume
	Base	Height		
10.	13 cm	6 cm	5 cm	
11.	7.4 cm	5 cm	10 cm	
12.	23 cm	10.5 cm	6.6 cm	
13.	3.4 m	2.0 m	4.7 m	
14.	33 mm	17 mm	27 mm	

15. Calculate the volume of the birdhouse.



_____

16. The hexagonal prism is made from 6 triangular prisms. Calculate its volume.



_____

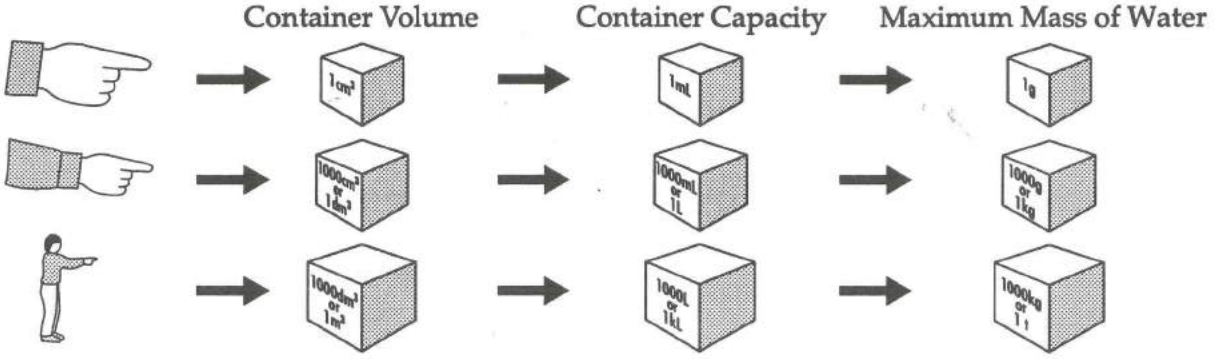
Name _____

8.10 Volume, Capacity, and Mass

MATHPOWER™ *Seven*, pp. 288–289

The capacity of a container is the greatest volume it will hold.

There is a special relationship between the volume and mass of water.



Express in litres.

1. 350 mL	**2.** 5 kL	**3.** 4200 mL
_____	_____	_____
4. 2.5 kL	**5.** 25 mL	**6.** 3000 mL
_____	_____	_____

Express in millilitres.

7. 24 L	**8.** 7 L	**9.** 10.25 L
_____	_____	_____
10. 0.7 L	**11.** 1.05 L	**12.** 6.2 L
_____	_____	_____

Express in grams.

13. 250 mg	**14.** 0.5 kg	**15.** 8 kg
_____	_____	_____
16. 1140 mg	**17.** 8.25 kg	**18.** 4500 mg
_____	_____	_____

Express in kilograms.

19. 48 g	**20.** 8 t	**21.** 12 000 mg
_____	_____	_____
22. 0.85 t	**23.** 350 g	**24.** 3600 g
_____	_____	_____

25. What mass of water could a 500-cm^3 container hold?

_____

26. What is the capacity of a container that has a volume of 500 cm^3?

_____

27. Mariette had a mass of 3.4 kg when she was born. Her mass now is 13 times her mass at birth. What is her present mass?

_____

28. A swimming pool that is 6 m long and 3.7 m wide is filled to a depth of 1.2 m.

a) What is the volume of water in the pool?

_____

b) What is the mass of water in the pool?

_____

29. Find the volume of water with each mass.

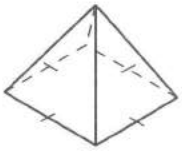
a) 2 mg	**b)** 330 g
_____	_____
c) 10.3 kg	**d)** 122 g
_____	_____

Name _____

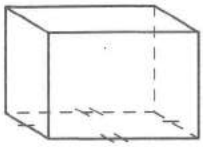
Test One CHAPTER 8: Three-Dimensional Geometry

MATHPOWER™ *Seven*, pp. 263–297

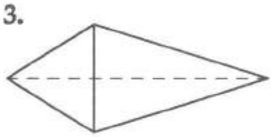
Name each polyhedron.

1. 

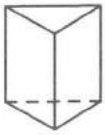
_____

2. 

_____

3. 

_____

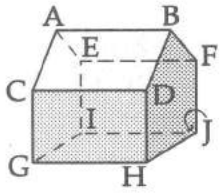
4. 

_____

Complete the chart.

	Polyhedron	Number of Faces	Number of Edges	Number of Vertices
5.	Cube			
6.	Pentagonal Prism			
7.	Triangular Prism			
8.	Triangular Pyramid			

For the pentagonal prism shown below, name the following.



9. the pairs of congruent faces

_____

10. 2 pairs of perpendicular edges

_____

11. 2 pairs of parallel edges

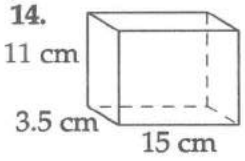
_____

Draw a net for each polyhedron.

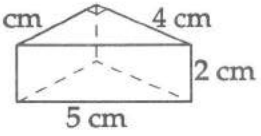
12. a square pyramid

13. a cube

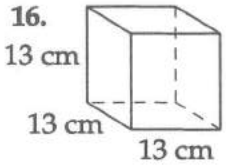
Calculate the volume and surface area of each prism.

14. 

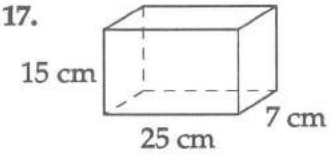
Volume _____ Surface area _____

15. 

Volume _____ Surface area _____

16. 

Volume _____ Surface area _____

17. 

Volume _____ Surface area _____

18. A rectangular tank of water measures 50 cm long, 40 cm wide, and 15 cm high. It is filled with water to a depth that is 8 cm from the top.

a) What volume of water is in the tank?

_____

b) What is the mass of the water in the tank?

_____

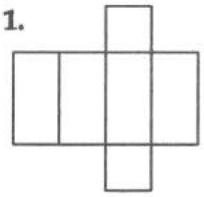
Name _____

Test Two CHAPTER 8: Three-Dimensional Geometry

MATHPOWER™ *Seven*, pp. 263–297

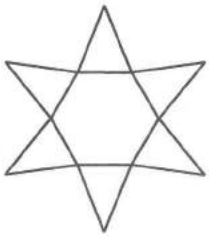
Name the polyhedron that could be constructed from each of the following nets.

1.



_____

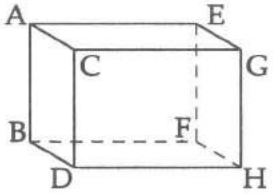
2.



_____

3. Draw a net for a triangular prism.

For the following prism, complete each statement.



4. AB is parallel to _____

5. EFHG is congruent to _____

6. EG is parallel to _____

7. ABFE is congruent to _____

8. GH ⊥ _____

9. CG ⊥ _____

Write the number of faces, edges, and vertices for each polyhedron.

10. rectangular prism _____

11. square pyramid _____

12. triangular prism _____

13. pentagonal pyramid _____

The face containing the question mark is the top face of the cube. Which symbol is on each face?

14. bottom face

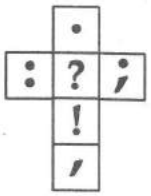
_____

15. front face

_____

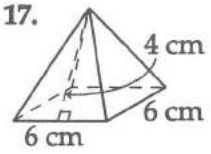
16. back face

_____



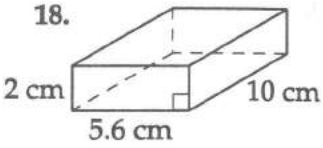
Calculate the surface area of each polyhedron.

17.



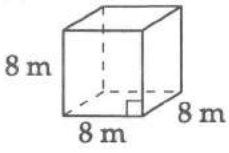
_____

18.



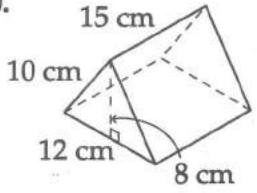
_____

19.



_____

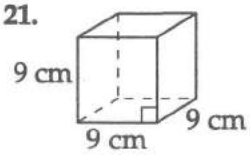
20.



_____

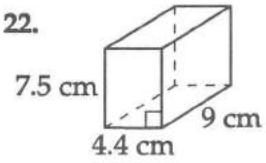
Calculate the volume of each polyhedron.

21.



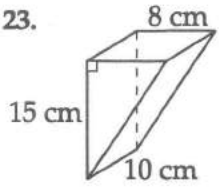
_____

22.



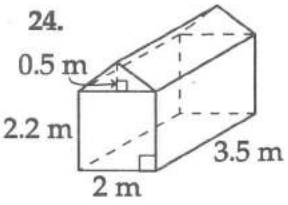
_____

23.



_____

24.



_____

25. a) Calculate the volume of a cubic flower pot with sides that measure 8 cm.

_____

b) If the pot is filled with soil to a depth of 6 cm, what is the volume of the soil?

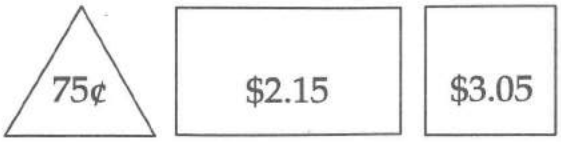
_____

Name _____

Extension CHAPTER 8: Three-Dimensional Geometry

MATHPOWER™ *Seven*, pp. 263–297

Given the values of the faces shown below, calculate the total value of each polyhedron.



1. cube _____

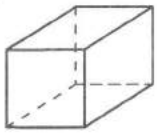
2. rectangular prism _____

3. triangular pyramid _____

4. square pyramid _____

Paula has straws to build edges and pipe cleaners to join the straws at their vertices. Describe how many straws and pipe cleaners she needs to construct each polyhedron.

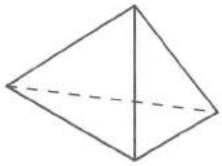
5.



_____

_____

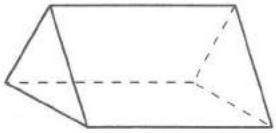
6.



_____

_____

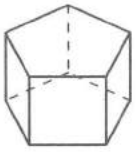
7.



_____

_____

8.



_____

_____

9. Robert has a set of 2-cm building cubes. He keeps them in a box that is 30 cm long, 10 cm wide, and 10 cm high.

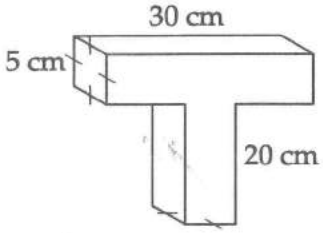
a) What is the volume of the box?

_____

b) How many 2-cm cubes are in the set?

_____

10. Calculate the volume of the letter T.



_____

11. Each plan shows the shape of the base of a model made of cubes. The numbers indicate the number of blocks piled on top of each other. For each model, sketch the front view, the right side view, and the top view.

a)

2	2	1
1	1	

b)

2	3
1	1

12. A cube has a surface area of 96 cm^2. What is the length of each edge of the cube?

_____

13. A barrel has a mass of 30 kg and a capacity of 120 L. When the barrel is 70% full of water, what is the total mass, in kilograms, of the barrel and the water?

_____

Name _____

9.1 Collecting Data

MATHPOWER™ *Seven*, pp. 302–303

Data are often collected and organized in survey sheets to show people's preferences.

The **frequency** is the number of people who choose a particular item.

---

1. The 28 students in Mr. Leland's class were surveyed.

a) Complete the frequency column on the survey sheet.

Favourite Musical Instruments		
Musical Instrument	**Tally**	**Frequency**
Flute	|	
Guitar	𝍸 𝍸 𝍸	
Piano	𝍸 |	
Trombone	||	
Trumpet	||||	

b) Which musical instrument was the most favourite?

_____

c) List the instruments from most favourite to least favourite.

_____

_____

2. Listed below are some flying distances in kilometres.

Calgary to Montreal	3003
Toronto to Charlottetown	1326
Winnipeg to Saskatoon	707
St. John's to Halifax	880
Ottawa to Vancouver	3550

a) Use the following table to organize the data from greatest flying distance to least flying distance.

b) What is the difference between the greatest flying distance and the least flying distance?

_____

3. Several movie watchers gave their movie-subject preferences. The results are shown in the following table. A means adventure, C means comedy, H means horror, and B means biography.

A	A	H	B	H	H	H	C
A	A	A	A	C	H	H	A
C	C	A	B	B	A	A	A
A	H	H	H	C	C	A	A
H	H	H	A	A	A	C	B

a) Complete the survey sheet.

Favourite Movie Types		
Movie Type	**Tally**	**Frequency**
Adventure		
Comedy		
Horror		
Biography		

b) What type of movie is most preferred by this group of movie watchers?

_____

c) How many movie watchers were surveyed?

_____

4. Conduct a survey in your class by asking the question, "What is your favourite month of the year?" Complete a survey sheet, then organize the data from most popular month to least popular month.

Name _____

9.2 Using a Sample to Make Predictions

MATHPOWER™ *Seven*, pp. 306–307

Instead of questioning very large numbers of people, someone may survey a **sample**. If the sample is chosen properly, the results from the sample can be used to make predictions.

1. Sanjay surveyed 60 of the 600 students in his school to find out how many had computers at home. He found that 18 of the students in his sample had home computers. How many students in the school would Sanjay predict to have home computers?

_____

2. Tanya surveyed 60 of the 510 students in her school to find out how many students walked to school. She found that 12 students in her sample walked to school. What was Tanya's prediction for the total number of students who walked to school?

_____

3. The Barkerville Parks and Recreation Department surveyed 100 people to find out how many people were in favour of bicycle trails through the town. The results of the survey are shown in the table.

Bicycle Trail Survey		
Opinion	**Number**	**Percent**
Yes	53	
No	28	
Undecided	19	

a) Complete the percent column in the table.

b) The town of Barkerville has 12 000 residents. Use the percents from the survey to predict how many of the residents were in favour of bicycle trails, how many were opposed, and how many were undecided.

In favour _____

Opposed _____

Undecided _____

4. The Music Machine was opening a new store in Valley Falls. About 4000 people in the town were potential customers of the new store. A survey of 200 of these people showed the following preferences in music.

Favourite Music		
Type of Music	**Number**	**Percent**
Country	80	
Rock or Pop	64	
Rap	10	
Reggae	12	
Classical	25	
Jazz	6	
Other	3	

a) Complete the percent column in the table.

b) Use the percents to predict how many people might buy each type of music.

Country _____ Rock or Pop _____

Rap _____ Reggae _____

Classical _____ Jazz _____

Other _____

5. A sunscreen manufacturer wants to predict the percent of people interested in trying a new sunscreen product. Explain why each of the following samples would be biased.

a) 200 people sunbathing on a beach

_____

b) 100 people who burn easily in the sun

_____

c) 250 people who work indoors all day

_____

Name _____

9.3 Reading and Drawing Pictographs

MATHPOWER™ *Seven*, pp. 308–309

A **pictograph** is a picture graph.

This type of graph uses pictures or symbols to compare similar things.

1. The following pictograph shows the numbers of boxes of tarts sold over 5 days.

Tart Sales	
Day 1	8
Day 2	5½
Day 3	7
Day 4	5
Day 5	8½
Each	represents 10 boxes.

a) How many boxes of tarts were sold on each of the 5 days by the corner bakeshop?

b) How many boxes of tarts were sold altogether?

c) Each box of tarts costs $1.49. How much money was earned by the bakeshop in 5 days from the sale of tarts?

2. The table shows the amount of weekly T-shirt sales at a boutique.

Week	T-Shirt Sales
1	$400.00
2	$300.00
3	$550.00
4	$500.00
5	$250.00

Display the data on the pictograph, using an appropriate symbol.

T-Shirt Sales	
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Each	represents

3. The pictograph shows the approximate amount of record sales by some Canadian artists in 1993.

Record Sales	
Bryan Adams	●
Rovers	● ●
Northern Lights	● ● ●
Each ●	represents $100 000 in sales.

a) What was the approximate amount of record sales by each Canadian artist or group?

b) Sketch a symbol that could be used in the pictograph to represent each of the following amounts of record sales.

$50 000 _____ $25 000_____ $75 000_____

4. The following table shows the results of a survey that asked, "What is your favourite summer activity?"

Favourite Summer Activity		
Activity	**Tally**	**Frequency**
Cycling	𝍸	
Canoeing	𝍸 𝍸	
Swimming	𝍸 𝍸 𝍸	
Hiking	𝍸 𝍸 𝍸	
Water-skiing	𝍸 𝍸	

a) Complete the frequency column and display the data in the following pictograph.

Favourite Summer Activity	
Cycling	
Canoeing	
Swimming	
Hiking	
Water-skiing	
Each	represents

b) How many people were surveyed?

Name _____

9.4 Reading Bar Graphs and Broken-Line Graphs

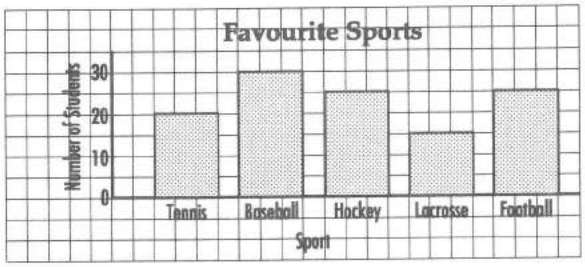
MATHPOWER™ *Seven*, pp. 310–311

A **bar graph** compares similar items by using bars of different heights.

The height of each bar on a bar graph shows the number of responses for that item.

A **broken-line graph** uses a series of line segments to show how something changes with time.

1. The bar graph shows the results of a survey in which students were asked, "What is your favourite sport?"



a) Which sport was most popular?

_____

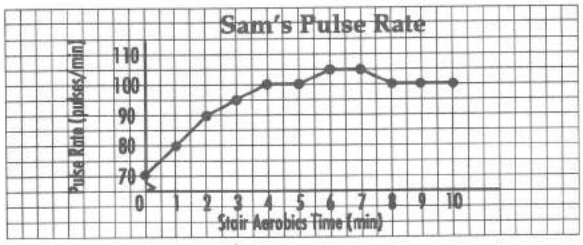
b) How many students preferred lacrosse?

_____

c) How many students were surveyed?

_____

2. The broken-line graph shows Sam's pulse rate during 10 min of stair aerobics.



a) What was Sam's pulse rate before he began to exercise?

_____

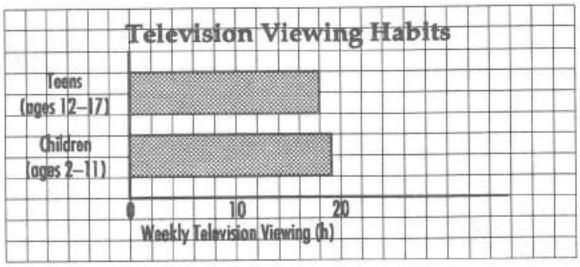
b) After how many minutes did Sam's pulse reach its highest rate?

_____

c) What was his highest pulse rate?

_____

3. The bar graph shows the average number of hours per week of television viewing for young Canadians.



a) Which age group watches more television?

_____

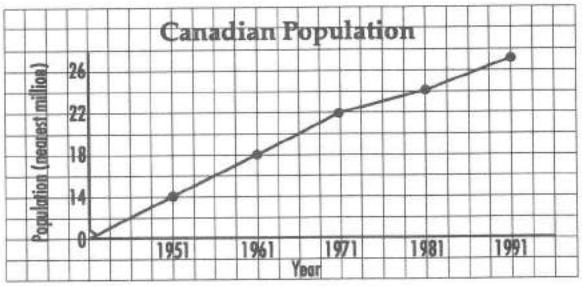
b) How many hours of television do teens watch?

_____

c) What is the difference in the number of hours watched by teens and by children?

_____

4. The broken-line graph shows the Canadian population to the nearest million every 10 years from 1951 to 1991.



a) What was the Canadian population to the nearest million every 10 years from 1951 to 1991?

_____

b) By how many millions did the population increase from 1951 to 1991?

_____

Name _____

9.5 Drawing Bar Graphs

MATHPOWER™ *Seven*, pp. 312–313

To draw a bar graph, draw all the bars the same width and leave an identical amount of space between adjacent bars.

Choose a scale so that all the data can be shown. Label the horizontal axis and the vertical axis.

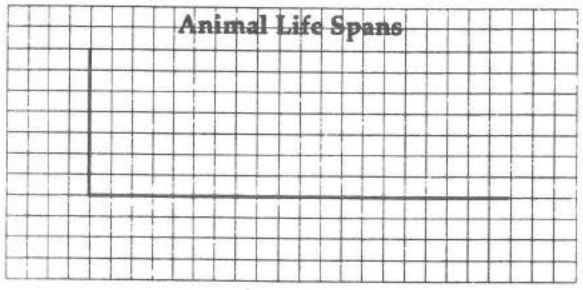
Draw the height of each bar to match the numerical data for the item.

---

1. The following table shows the average life span of 5 animals.

Animal	Life Span (years)
Beaver	20
Elephant	60
Deer	15
Orangutan	35
Rhinoceros	50

a) Display this information on a bar graph.



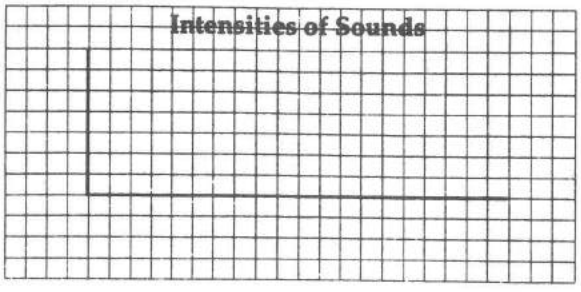
b) Which animal's life span is one-quarter of the elephant's life span?

_____

2. The intensities of some sounds are shown.

Sound	Intensity (decibels)
Quiet Room	20
Quiet Conversation	50
Pneumatic Drill	100
Threshold of Pain	130

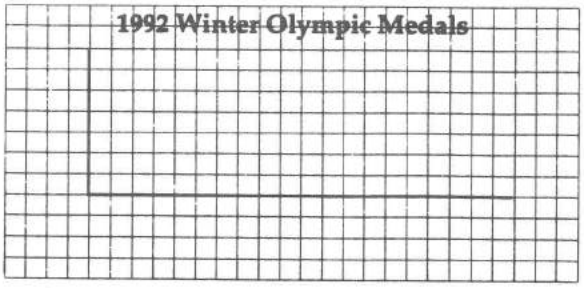
Display this information on a bar graph.



3. The table shows the medals won by several countries at the 1992 Winter Olympics.

Country	Medals
Canada	7
Italy	14
Norway	20
Austria	21
CIS	23
Germany	26
France	9
Finland	7
United States	11

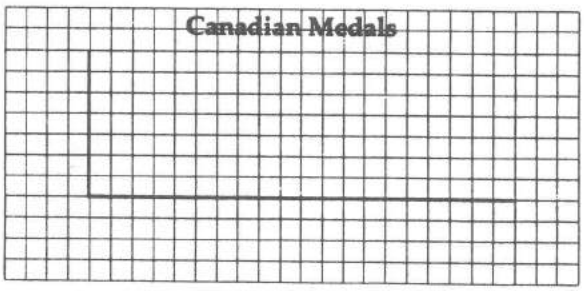
a) Display this information on a bar graph.



b) Which country won 3 times as many medals as Canada?

_____

c) Of Canada's 7 medals, 2 were gold, 3 were silver, and 2 were bronze. Display this information on a bar graph.



Name _____

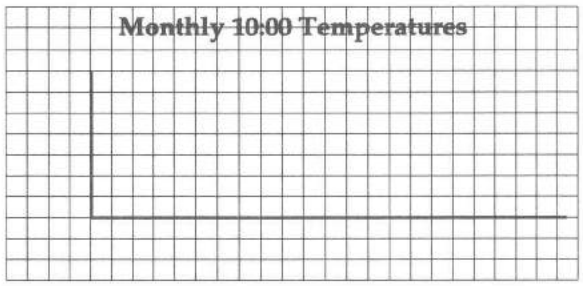
9.6 Drawing Broken-Line Graphs

MATHPOWER™ *Seven*, pp. 314–315

1. The temperature was recorded at 10:00 on the first school day of each month from January to June, as shown in the table.

Month	Temperature (°C)
January	0
February	2
March	10
April	5
May	14
June	20

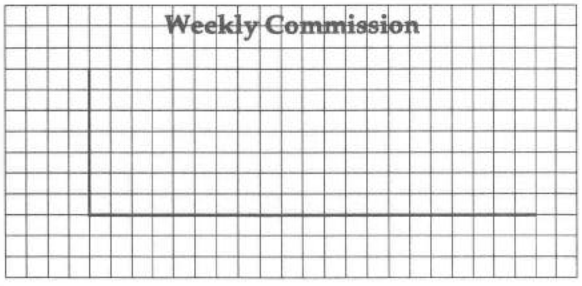
Display these data on a broken-line graph.



2. The table shows the amount of commission Bob earned over 4 weeks.

Week	Commission Earned
1	$300.00
2	$450.00
3	$500.00
4	$550.00

Display these data on a broken-line graph.



3. The proceeds for Middleton School's annual craft sale are shown in the table.

Day	Proceeds
Tuesday	$95.00
Wednesday	$100.00
Thursday	$80.00
Friday	$150.00
Saturday	$200.00

a) Display these data on a broken-line graph.

4. The table shows Canada's wheat exports for 5 years.

Year	Wheat Exports (millions of tonnes)
1988	24
1989	12
1990	17
1991	22
1992	25

a) Display these data on a broken-line graph.

b) Write 1 question that can be answered by reading the broken-line graph.

_____

Name _____

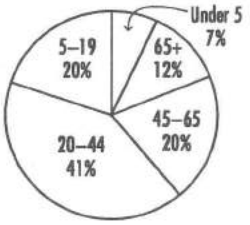
9.7 Reading Circle Graphs

MATHPOWER™ *Seven*, pp. 316–317

A **circle graph** shows how something is divided into parts.

1. The circle graph shows the distribution of Canada's population by age group.

Canada's Population



Calculate the number of people in each age group, given a population of 27 297 000.

a) Under 5 _____

b) 5 to 19 _____

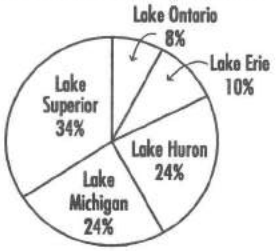
c) 20 to 44 _____

d) 45 to 65 _____

e) 65+ _____

2. The circle graph shows how the area of the Great Lakes is divided.

Area of the Great Lakes



The total area of the Great Lakes is about 244 200 km^2.

What area is covered by each lake?

a) Lake Superior _____

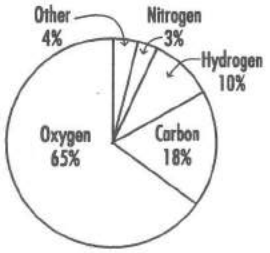
b) Lake Huron _____

c) Lake Erie _____

d) Lake Ontario _____

3. The circle graph shows the chemical elements that make up the human body.

Elements in the Human Body



For a person with a mass of 60 kg, find the mass of

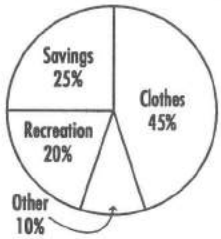
a) oxygen. _____

b) carbon. _____

c) nitrogen. _____

4. The circle graph shows how Michelle spent her monthly earnings from her part-time job.

Monthly Spending



If her earnings for the month were $350.00, how much did she spend in each category?

a) Clothes _____

b) Savings _____

c) Recreation _____

d) Other _____

Name _____

9.8 Drawing Circle Graphs

MATHPOWER™ *Seven*, pp. 318–319

To draw a circle graph, divide the 360° angle at the centre of a circle into smaller angles with the correct sizes.

In questions 1–4, display the information on a circle graph.

1. The table shows where Canadians live.

Alberta	9%
British Columbia	12%
Ontario	37%
Quebec	25%
Other Provinces and Territories	17%

2. In 1992, the refugees who were admitted to Canada came from the following parts of the world.

Africa	19%
Central America	15%
Eastern Europe	6%
Indochina	17%
Middle East	16%
South America	4%
Other	23%

3. Every 100 audio recordings sold in Canada in 1993 were made up as follows.

Cassettes	41
Compact Discs	56
Music Videos	1
Singles	2

4. A typical human adult has 206 bones. They are distributed as follows.

Pectoral Girdle and Hands	64
Pelvic Girdle, Legs, and Feet	62
Rib Cage and Sternum	25
Skull	29
Spine	26

5. Use a circle graph to show how you spend your leisure time.

Name _____

9.9 The Mean or Average

MATHPOWER™ *Seven*, pp. 322–323

The **mean** or **average** of a set of numbers is the sum of the numbers divided by the number of numbers. The **range** is the numerical spread from the highest number to the lowest number.

Find the mean of each set of numbers.

1. 14, 17, 27, 16, 26 _____
2. 26, 17, 34, 31, 48, 36 _____
3. 29, 14, 37, 24, 51, 31 _____
4. 96, 62, 100, 74 _____
5. 55, 89, 111, 33 _____
6. 157, 127, 164, 148, 139 _____

Find the average for each set of numbers.

7. 88, 78, 94, 84 _____
8. 40, 53, 47, 38, 57 _____
9. 114, 278, 141, 295 _____
10. 88, 129, 107, 96, 115 _____

11. The temperature was recorded once a day at 14:00 for 1 week in September.

25°C 21°C 23°C 19°C 15°C 18°C 19°C

What was the average temperature for the week?

_____

12. Five students at Glengarry School collected the following amounts of money from their spring bake sale.

$119.50 $99.80 $72.50 $86.75 $124.60

What was the average amount of money collected from the bake sale?

_____

13. There are six grade 8 classes at Mooreville School with different numbers of students as shown.

23 25 27 30 21 24

a) What is the range of values?

_____

b) What is the average class size?

_____

Write the range and mean, to the nearest tenth, for each of the following sets of values.

14. 31, 33, 23, 45, 24

Range _____

Mean _____

15. 94, 79, 74, 107, 87

Range _____

Mean _____

16. 186, 140, 169, 192, 111, 158, 173

Range _____

Mean _____

17. 224, 270, 198, 251, 169, 258, 206

Range _____

Mean _____

18. 117, 93, 104, 131, 135, 109

Range _____

Mean _____

19. 726, 829, 803, 830, 906, 731

Range _____

Mean _____

20. 83, 60, 37, 109, 83, 121, 28, 52

Range _____

Mean _____

21. 918, 999, 743, 812, 859, 627

Range _____

Mean _____

22. The table shows the points scored by 4 members of the basketball team in their first 3 games.

Player	Game 1	Game 2	Game 3
Pauline	22	12	17
Leslie	10	14	21
Teresa	28	19	23
Dianne	7	9	14

To the nearest point, what is the mean of the values in the table?

_____

Name _____

9.10 The Median and the Mode

MATHPOWER™ *Seven*, pp. 324–325

The **median** is the middle number in a set of numbers arranged in order.

The **mode** is the number that occurs most often in a set of numbers.

Find the median.

1. 27, 33, 19, 45, 34

_____

2. 86, 78, 75, 83, 81, 79

_____

3. 103, 121, 114, 118, 132, 100

_____

4. 284, 350, 303, 279, 402

_____

Find the mode or modes of each set of numbers.

5. 2, 4, 5, 4, 3, 4, 2, 7

_____

6. 36, 35, 37, 36, 40, 39

_____

7. 62, 68, 64, 68, 67, 65, 64, 61

_____

List the following.

8. 4 different numbers with a median of 32

_____

9. 5 different numbers with a median of 43

_____

10. 7 different numbers with a median of 87

_____

11. Thirteen students scored the following marks on a math test.

70 68 63 59 82 84 78 73 76 64 82 91 85

a) Determine the mean, median, and mode of these marks.

_____

_____

b) How many students scored above the median?

_____

c) How many students scored above the mode?

_____

d) How many students scored above the mean?

_____

12. The list includes the names of 8 famous Canadians and their life spans.

Norman Bethune	1890–1939	_____
Joseph-Armand Bombardier	1907–1964	_____
Ned Hanlan	1855–1908	_____
Helen Sawyer Hogg	1905–1993	_____
Margaret Laurence	1926–1987	_____
Lester B. Pearson	1897–1972	_____
Mary Pickford	1893–1979	_____
Emily Stowe	1831–1903	_____

a) Complete the list by finding the number of years each person lived.

b) Determine the mean, median, and range of the values you found in part a).

Mean _____ Median _____ Range _____

c) Do your values in part a) have a mode?

_____

d) How many people on the list lived for less than the mean value?

_____

e) How many people on the list lived for less than the median value?

_____

f) Investigate why each person on the list was famous.

_____

Name _____

9.11 Stem-and-Leaf Plots

MATHPOWER™ *Seven*, pp. 326–327

In a stem-and-leaf plot, data are organized in increasing order.

1. Find the median, mode, and range.

Heights of People (cm)	
15	0 3 5
16	1 4 6 6 9
17	0 3 4 7 8 9
18	2 4 7
19	1

Median_____ Mode_____ Range_____

2. The stem-and-leaf plot shows the total rainfall, in millimetres, in 19 Canadian cities in July. Find the median, mode, and range.

Total Rainfall (mm)	
3	2 4
4	6 7
5	3 4 6
6	3 5
7	1 2 5 6
8	3 4 4 6
9	0 5

Median_____ Mode_____ Range_____

3. The list shows the numbers of days of blowing snow per year at 14 Canadian airports.

9 9 32 25 6 14 16 20 14 14 26

31 10 3

a) Construct a stem-and-leaf plot.

b) Find the median, mode, and range.

Median _____

Mode _____

Range _____

c) At how many of the airports is the number of days of blowing snow less than the mode?

_____

4. The list shows the total points scored in 20 Grey Cup finals from 1973 to 1992.

40 27 17 43 47 33 26 58 49 48 35

64 61 54 74 43 83 61 57 34

a) Construct a stem-and-leaf plot.

b) Find the median, mode, and range.

Median _____ Mode _____ Range _____

c) In how many finals was the total number of points greater than 60?

_____

Name _____

9.12 Possible Outcomes

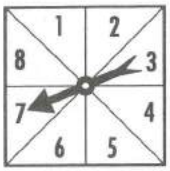
MATHPOWER™ *Seven*, pp. 330–331

When you conduct an experiment, each result you get is called an **outcome**.

When the chance of getting each different outcome is the same, we say that the outcomes are **equally likely**.

For each experiment, list the possible outcomes. Decide if the outcomes are equally likely or not. If the possible outcomes are not equally likely, state the most likely outcome.

1. Spin the spinner.



_____

_____

2. Pull 2 coins from a bag containing 1 penny, 1 dime, 1 nickel, and 1 quarter without looking.

_____

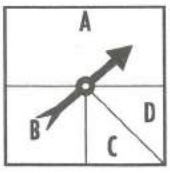
_____

3. Roll a die and toss 2 coins at the same time.

_____

_____

4. Spin the spinner.



_____

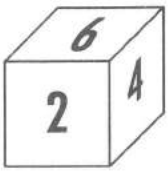
_____

5. Choose 1 marble without looking from a bag containing 3 red marbles, 2 blue marbles, and 1 green marble.

_____

_____

6. Roll a cube with faces numbered 2, 4, 6, 8, 10, and 12.

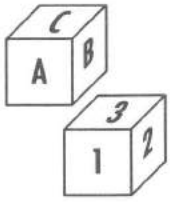


_____

_____

_____

7. Roll a cube with faces lettered A, B, C, D, E, and F and a cube with faces numbered 1, 2, 3, 4, 5, and 6 at the same time.



_____

_____

_____

_____

_____

8. Choose one card without looking

M	A	T	H	E	M	A	T	I	C	S

_____

_____

9. Drop a cone-shaped paper cup on the floor.

_____

_____

Name _____

9.13 Probability

MATHPOWER™ *Seven*, pp. 332–333

The **probability** that an outcome will occur is the ratio of the number of ways the outcome can occur to the total number of possible outcomes.

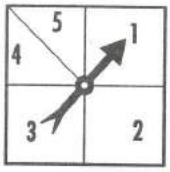
Find the following probabilities when the arrow is spun.

1. *P*(2) _____
2. *P*(6) _____
3. *P*(4 or 8) _____
4. *P*(odd number) _____

A bag contains 4 black cubes, 2 yellow cubes, and 3 orange cubes. If one cube is drawn from the bag, find each probability.

5. *P*(black) _____
6. *P*(yellow) _____
7. *P*(orange) _____

Find the following probabilities when the arrow is spun.



8. *P*(2) _____
9. *P*(1) _____
10. *P*(4) _____
11. *P*(3 or 5) _____

Maria wrote each letter of the word STATISTICS on a separate card and then put all the cards in a box. If she pulls out one card without looking, what are the following probabilities?

12. *P*(S) _____
13. *P*(I) _____
14. *P*(C) _____
15. *P*(vowel) _____
16. *P*(consonant) _____

Find the following probabilities for this spinner.

17. *P*(2) _____
18. *P*(4) _____
19. *P*(odd number) _____
20. *P*(whole number) _____
21. *P*(6) _____
22. *P*(3 or 2) _____

A bag contains 3 blue marbles, 2 red marbles, and 1 green marble. If you choose one marble without looking, what are the following probabilities?

23. *P*(blue) _____
24. *P*(red) _____
25. *P*(green) _____
26. *P*(yellow) _____
27. *P*(blue or green) _____
28. *P*(red or green) _____

Choose one card without looking and state the following probabilities.

1	2	3	4	5	6	7	8

29. *P*(5) _____
30. *P*(odd number) _____
31. *P*(composite number) _____
32. *P*(number greater than 5) _____
33. *P*(number less than 9) _____
34. *P*(factor of 10) _____
35. Draw a spinner with these probabilities.

$P(2) = \frac{1}{2}$ $P(1) = \frac{1}{4}$

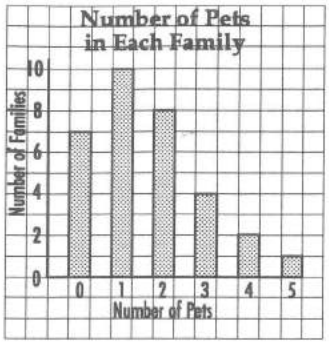
$P(3) = \frac{1}{4}$ $P(4) = 0$

Name _____

Test One CHAPTER 9: Statistics

MATHPOWER™ *Seven*, pp. 299–339

The graph shows the number of pets owned by families of students in one grade 7 class.



1. How many families were surveyed?

_____

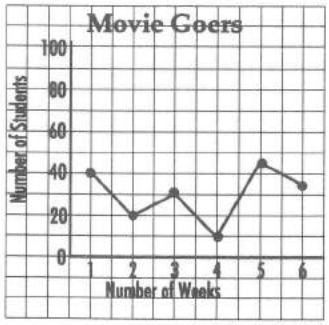
2. How many families have 1 pet?

_____

3. How many families have more than 2 pets?

_____

One hundred students were surveyed to find out how many went to the movies each week for 6 weeks.



4. What was the smallest number of movie goers in 1 week?

_____

5. In what weeks did more than 30 students go to the movies?

_____

6. What was the greatest number of movie goers in 1 week?

_____

7. The table shows the percent of Canadians that have each of the 4 blood types. Display this information on a circle graph.

Type A	43%
Type B	8%
Type AB	3%
Type O	46%

8. Jessie bought a compact disc every month with the money he earned delivering newspapers. In 6 months he spent $15.99, $17.99, $21.00, $18.49, $12.99, and $16.00. Find the average cost of 1 compact disc.

_____

The pictograph shows the countries that won the most medals in the 1992 Winter Olympics.

1992 Winter Olympic Medal Winners	
Austria	○○○○○○○○○◖
CIS	○○○○○○○○○○◖
Germany	○○○○○○○○○○○○
Italy	○○○○○○○
Norway	○○○○○○○○○○
United States	○○○○○◖
Each ○ represents 2 medals.	

9. What is the difference between the greatest number of medals won and the least number of medals won?

_____

10. Which countries won more than 20 medals?

_____

A bag contains 3 red marbles, 2 green marbles, 5 blue marbles, and 1 yellow marble. If you pull out only 1 marble without looking, what are the following probabilities?

11. *P*(red) _____

12. *P*(blue) _____

13. *P*(green) _____

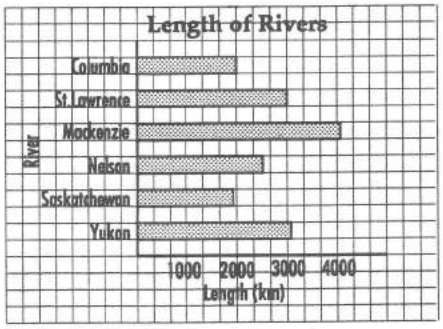
14. *P*(yellow) _____

Name _____

Test Two CHAPTER 9: Statistics

MATHPOWER™ *Seven*, pp. 299–339

The graph displays the approximate lengths of the 6 longest rivers in Canada.



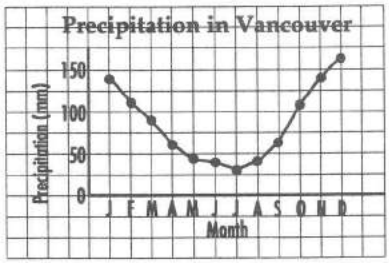
1. About how long is the longest river?

_____

2. Which rivers are longer than 2500 km?

_____

The broken-line graph shows the average precipitation in Vancouver for one year.



3. Which months had less than 100 mm of precipitation?

_____

4. What was the average amount of precipitation for the year?

_____

5. The table shows how David spent his earnings from his summer job. Display this information on a circle graph.

Clothes	30%
Recreation	45%
Savings	15%
Other	10%

The zoo gift shop sells sweat shirts. The pictograph shows the numbers sold for the last 6 days.

Sales of Sweat Shirts	
Day 1	👕👕👕👕
Day 2	👕👕👕👕👕👕
Day 3	👕👕
Day 4	👕👕👕👕
Day 5	👕👕👕👕👕👕👕
Day 6	👕👕👕👕👕👕👕
Each 👕 represents 10 sweat shirts.	

6. Estimate the average number of sweat shirts sold each day.

_____

7. Estimate the number of sweat shirts sold altogether. _____

8. The table shows the amount of snow that fell during 1 week.

Day	Snowfall (cm)
Sunday	3
Monday	10
Tuesday	7
Wednesday	15
Thursday	10
Friday	5
Saturday	18

Find the average snowfall that week to the nearest centimetre.

_____

Kenji has 3 red markers, 2 blue markers, 4 purple markers, 1 white marker, and 2 pink markers in a bag. If he pulls out 1 marker without looking, what are the following probabilities?

9. *P*(blue) _____ 10. *P*(red) _____

11. *P*(purple) _____ 12. *P*(white) _____

13. *P*(pink) _____

Name _____

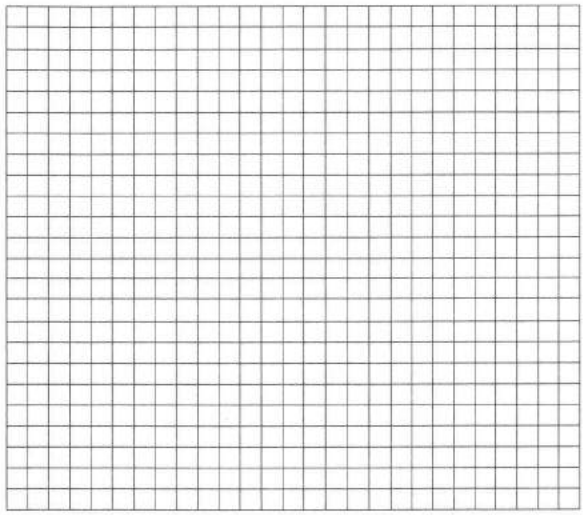
Extension CHAPTER 9: Statistics

MATHPOWER™ *Seven*, pp. 299–339

The table shows the masses of 6 full-grown animals.

Animal	Mass (kg)
Elephant	4600
Giraffe	1200
Lion	200
Moose	700
Polar Bear	400
Rhinoceros	3000

1. Display this information on a bar graph.



2. Find the masses of 3 more animals and add them to your graph.

Survey your classmates to determine the 4 vegetables they like best.

3. Construct a pictograph to display the results of your survey.

4. Find the cost of purchasing each vegetable in your survey.

_____

5. Construct a graph of these costs.

6. Is there a relationship between the cost of the vegetables and student preferences? Explain.

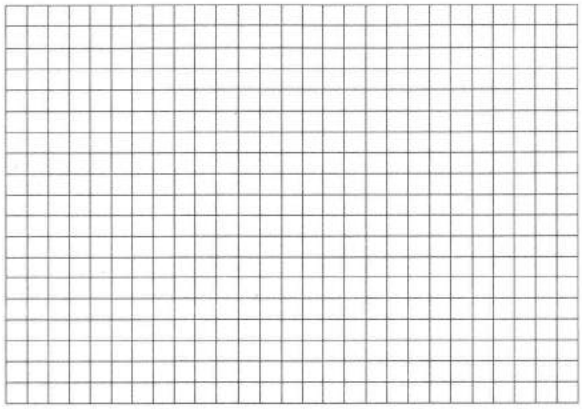
_____

_____

The table shows the population of Calgary in 5 different years.

Year	Population (thousands)
1951	142.3
1961	279.1
1971	403.3
1981	592.6
1991	754

7. Display these data on a broken–line graph.



8. Estimate the year in which Calgary's population reached 350 000.

_____

9. Predict the population of Calgary in the year 2001.

_____

10. Survey your class to find the total distance, in kilometres, that each student travels from home to school and back again on a school day.

a) Present the data on a stem-and-leaf plot.

b) Find the mean, median, mode, and range of the data.

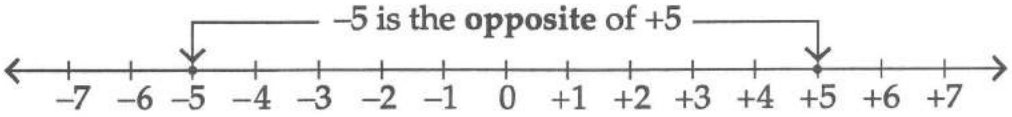
Mean _____ Median_____

Mode _____ Range_____

Name _____

10.1 Integers

MATHPOWER™ *Seven*, pp. 344–345



Negative integers are smaller than 0.

Zero is neither positive nor negative.

Positive integers are greater than 0.

Write each integer in words.

1. +4 _____
2. –6 _____
3. 0 _____
4. +12 _____
5. –18 _____
6. –9 _____

Write each of the following as an integer.

7. a loss of six points _____
8. a gain of eleven points _____
9. four degrees Celsius above zero _____
10. two degrees Celsius below zero _____
11. down twenty metres _____
12. up nine metres _____

Write the opposite of each integer.

13. –4 _____ 14. +21 _____
15. +6 _____ 16. –2 _____
17. –33 _____ 18. +1 _____

Complete the table.

	Starting Temperature (°C)	Change (°C)	Final Temperature (°C)
19.	+9	down 4	
20.	+3	down 6	
21.	0	up 5	
22.	–1	down 3	
23.	–5	up 3	
24.	–3	up 4	

Use an integer to represent each statement. Use another integer to represent its opposite.

25. eight degrees Celsius below zero

_____ _____

26. sixty metres above sea level

_____ _____

27. a profit of twenty-five dollars

_____ _____

28. a loss of eleven points

_____ _____

29. nine steps down

_____ _____

30. three seconds after liftoff

_____ _____

31. Josh starts a game with 0 points. If he loses 6 points, gains 9 points, gains 3 points, loses 2 points, and gains 5 points, what is his final score?

_____

32. The temperature at noon was 4°C. Over the next 6 hours, the temperature rose 2°C, rose 3°C, dropped 1°C, dropped 2°C, rose 1°C, and dropped 4°C. What was the temperature at 18:00?

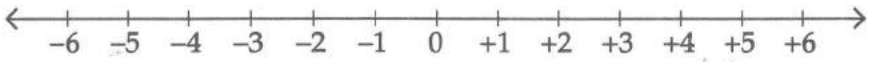
_____

Name _____

10.2 Comparing and Ordering Integers

MATHPOWER™ *Seven*, pp. 346–347

Integers increase in value from left to right.
The integer to the **right** of another integer on the number line is **greater**.
The integer to the **left** of another integer on the number line is **smaller**.



$-4 < +2$ $+4 > -6$ $+5 > 2$ $-3 > -5$

Insert > or < to make each statement true.

1. $+4 \square +6$ **2.** $-2 \square -3$

3. $+2 \square -1$ **4.** $-11 \square -8$

5. $-2 \square +6$ **6.** $+9 \square +8$

Circle the largest integer.

7. +3, +6, −2 **8.** −2, −4, −8

9. 0, −1, +1 **10.** −9, +2, +1

11. −4, −6, −5 **12.** −3, 0, +4

Circle the smallest integer.

13. +2, −3, +1 **14.** −1, −2, 0

15. +1, +4, +2 **16.** −4, −5, +1

17. −4, −1, −5 **18.** 0, +3, +1

Write each set of integers in order from largest to smallest.

19. +3, +7, −1, +2, −8

_____

20. 0, −3, +10, −10, +2

_____

21. +1, +3, 0, +2, −1

_____

22. −9, −7, −8, −11, −6

_____

23. +4, +7, −2, 0, −1

_____

Write each set of integers in order from smallest to largest.

24. −1, −3, +3, +1, 0

_____

25. +1, −2, −4, −3, +2

_____

26. +8, +5, −1, +7, 0

_____

27. −7, +2, −4, 0, +3

_____

28. +4, −2, +6, −1, −3

_____

29. −11, −4, +1, −7, +3

_____

30. Each letter has a value represented by the integer below it.

N	E	G	I	T	E	R
−8	+2	0	−10	−5	−2	+4

a) Which letter has the greatest value?

_____

b) Which letter has the least value?

_____

c) Which letters have opposite values?

_____

d) Which letters have values greater than 0?

_____

e) What word is formed when the letters are arranged from smallest to largest?

_____

Name _____

10.3 Adding Integers

MATHPOWER™ *Seven*, pp. 350–351

Adding integers

(+5) + (+3) = +8

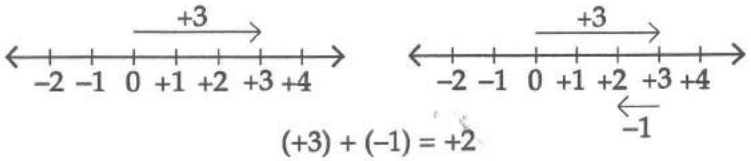
(–5) + (–3) = –8

(+5) + (–3) = +2

(–5) + (+3) = –2

Adding integers on a number line

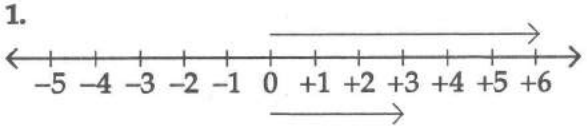
(+3) + (–1)



(+3) + (–1) = +2

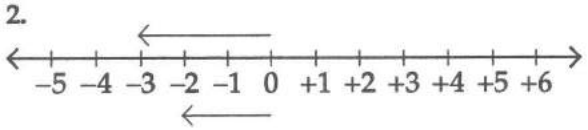
Write the addition statement.

1.



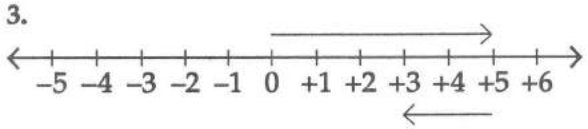
_____

2.



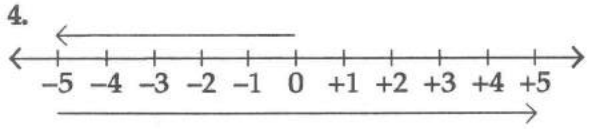
_____

3.



_____

4.



_____

Add.

5. (+7) + (+3) _____

6. (+5) + (–2) _____

7. (–3) + (+6) _____

8. (–6) + (+1) _____

9. (+4) + (–5) _____

10. (+6) + (–9) _____

11. (+8) + (–13) _____

12. (–10) + (+3) _____

Complete the table.

	Add.	+8	+3	–4	–1
13.	–3				
14.	+2				
15.	–9				
16.	+5				

Find the missing integer.

17. (+3) + ☐ = (+7)

18. (+5) + ☐ = –3

19. ☐ + (+2) = +1

20. (–7) + ☐ = –12

21. ☐ + (–4) = –8

22. ☐ + (–3) = 0

Show each addition using integer disks.

23. (+5) + (–3) + (–4) = _____

24. (–6) + (+4) + (–5) = _____

25. (–3) + (–3) + (+9) = _____

Add.

26. (+1) + (+3) + (+2) _____

27. (–4) + (–1) + (–3) _____

28. (+5) + (–2) + (+7) _____

29. (–9) + (–1) + (+6) _____

Name _____

10.4 Subtracting Integers

MATHPOWER™ *Seven*, pp. 352–353

To subtract an integer, add its opposite.
First, rewrite each subtraction sentence as an addition sentence.

(+4) – (+6)	(–3) – (–5)	(+6) – (–2)	(–4) – (+5)
= (+4) + (–6)	= (–3) + (+5)	= (+6) + (+2)	= (–4) + (–5)
= –2	= +2	= +8	= –9

Write the opposite of each integer.

1. +6 _____ **2.** –2 _____

3. +10 _____ **4.** –1 _____

5. +32 _____ **6.** –21 _____

Calculate.

	Addition	Subtraction
7.	(+8) + (+2) =	(+8) – (–2) =
8.	(–3) + (–4) =	(–3) – (+4) =
9.	(–2) + (–7) =	(–2) – (+7) =
10.	(+4) + (–6) =	(+4) – (+6) =
11.	(–5) + (+9) =	(–5) – (–9) =
12.	(+8) + (–3) =	(+8) – (+3) =

Complete each addition sentence and simplify.

13. (+3) – (–2) = (+3) + _____ = _____

14. (–2) – (–7) = (–2) + _____ = _____

15. (+9) – (+11) = (+9) + _____ = _____

16. (–1) – (–4) = (–1) + _____ = _____

17. (–5) – (+3) = (–5) + _____ = _____

18. (+8) – (+2) = (+8) + _____ = _____

Write the addition sentence and simplify.

19. (+3) – (+3) = _____ = _____

20. (–6) – (–1) = _____ = _____

21. (+7) – (+2) = _____ = _____

22. (–4) – (+4) = _____ = _____

23. (+2) – (+4) = _____ = _____

24. (–1) – (–7) = _____ = _____

Subtract.

25. (+10) – (–6) ____ **26.** (–14) – (+7) ____

27. (–3) – (–9) ____ **28.** 0 – (–9) ____

29. (–3) – (+6) ____ **30.** (+8) – (–9) ____

31. (+13) – (+7) ____ **32.** (–6) – (–12) ____

Find the missing integer.

33. ☐ – (–2) = –6 **34.** (+6) – ☐ = +4

35. (+9) – ☐ = –1 **36.** ☐ – (+2) = –7

37. (–8) – ☐ = –5 **38.** ☐ – (–3) = +5

The table shows the average early morning and mid-afternoon temperatures in April for six Canadian communities. Complete the table by finding the temperature increase from early morning to mid-afternoon for each community.

	Community	Average Temperature (°C)		Temperature Increase
		Early Morning	Mid-afternoon	
39.	Calgary	–3	+9	
40.	Charlottetown	–2	+6	
41.	Dawson	–9	+5	
42.	Halifax	–1	+8	
43.	Iqaluit	–19	–9	
44.	Vancouver	5	+13	

45. Mercury boils at +357°C and freezes at –39°C. What is the difference between the boiling point and the freezing point of mercury?

_____

Name _____

10.5 Multiplying Integers

MATHPOWER™ *Seven*, pp. 356–357

These are the rules for multiplying integers.

positive × positive = positive
(+3) × (+2) = +6

negative × negative = positive
(–5) × (–2) = +10

positive × negative = negative
(+3) × (–4) = –12

negative × positive = negative
(–4) × (+2) = –8

State whether each answer is positive or negative.

1. (+3) × (+4) = ☐ 12
2. (–2) × (+5) = ☐ 10
3. (–7) × (–3) = ☐ 21
4. (+3) × (–9) = ☐ 27
5. (–6) × (–7) = ☐ 42
6. (–4) × (+8) = ☐ 32

Multiply.

7. (+7) × (+4) _____
8. (–5) × (+8) _____
9. (–6) × (–6) _____
10. (+3) × (–6) _____
11. (–4) × (+8) _____
12. (+7) × (–7) _____
13. (+3) × (–11) _____
14. (–3) × (–10) _____

Multiply.

15. (–12) × (–12) _____
16. (+20) × (–10) _____
17. (–40) × (+3) _____
18. (+11) × (+12) _____
19. (+15) × (–20) _____
20. (–21) × (–5) _____
21. (+16) × (+3) _____
22. (–32) × (+2) _____

Find the missing integer.

23. (+4) × ☐ = +16
24. (–7) × ☐ = +21
25. ☐ × (+6) = –36
26. (+2) × ☐ = –18
27. ☐ × (–4) = –28
28. ☐ × (–5) = +25
29. (–11) × ☐ = +77
30. ☐ × (–8) = –32

Find each pair of integers, given their sum and product.

31. sum –14, product +24 _____
32. sum +3, product –18 _____
33. sum 0, product –16 _____
34. sum +9, product +8 _____
35. sum –4, product –12 _____
36. sum –1, product –6 _____
37. sum –11, product +30 _____
38. sum +1, product –72 _____
39. sum +7, product 0 _____

40. When Jocelyn set up her new aquarium, she installed a heater which warmed the water by 3°C each hour. By how much did the temperature increase after

a) 2 h?_____ b) 3 h?_____ c) 6 h?_____

Name _____

10.6 Dividing Integers

MATHPOWER™ *Seven*, pp. 358–359

A multiplication fact has two related division facts.

Multiplication fact	**Related division facts**
$(+4) \times (-6) = -24$	$\frac{(-24)}{(-6)} = +4$ and $\frac{(-24)}{(+4)} = -6$

The following are the rules for the signs when dividing integers.

positive ÷ positive = positive

positive ÷ negative = negative

negative ÷ positive = negative

negative ÷ negative = positive

Write two related division facts for each multiplication fact.

1. $(-11) \times (+5) = -55$

_____ _____

2. $(-4) \times (-8) = +32$

_____ _____

3. $(+6) \times (-7) = -42$

_____ _____

4. $(+2) \times (+9) = +18$

_____ _____

State whether each answer is positive or negative.

5. $(-18) \div (-3) =$ ☐ 6

6. $(+55) \div (-11) =$ ☐ 5

7. $(+54) \div (+6) =$ ☐ 9

8. $(-16) \div (+2) =$ ☐ 8

9. $(-12) \div (-6) =$ ☐ 2

10. $(+14) \div (-2) =$ ☐ 7

Divide.

11. $(-12) \div (-3)$

_____

12. $(-18) \div (+2)$

_____

13. $(-7) \div (+7)$

_____

14. $(+9) \div (-3)$

_____

15. $(+32) \div (+4)$

_____

16. $(-33) \div (-11)$

_____

Divide.

17. $\frac{(-8)}{(-2)}$ _____

18. $\frac{(+36)}{(-12)}$ _____

19. $\frac{(+45)}{(-5)}$ _____

20. $\frac{(-24)}{(+3)}$ _____

21. $\frac{(0)}{(-6)}$ _____

22. $\frac{(+48)}{(+16)}$ _____

Find the missing integer.

23. $(-15) \div$ ☐ $= +3$

24. $(+20) \div$ ☐ $= -10$

25. ☐ $\div (-4) = -3$

26. ☐ $\div (+6) = -7$

27. $(+26) \div$ ☐ $= +2$

28. $(-14) \div$ ☐ $= +2$

29. ☐ $\div (-9) = +3$

30. $(+10) \div$ ☐ $= -1$

Simplify.

31. $(-34) \div (-2)$

_____

32. $(-16) \div (+4)$

_____

33. $(+28) \div (-4)$

_____

34. $(+32) \div (+16)$

_____

35. $(-12) \div (-1)$

_____

36. $(+9) \div (-3)$

_____

37. $(+21) \div (-7)$

_____

38. $(-36) \div (-6)$

_____

39. The temperature dropped 12°C from 22:00 to 04:00 one night. What was the average drop in temperature each hour?

_____

Name _____

Test One CHAPTER 10: Integers

MATHPOWER™ *Seven*, pp. 341–365

Write each of the following as an integer.

1. a gain of ten points _____
2. three degrees Celsius below zero _____
3. five seconds before liftoff _____

Write the opposite of each integer.

4. –8 _____ 5. +3 _____ 6. –12 _____

Insert > or < to make each statement true.

7. –3 ☐ –7 8. 0 ☐ –4
9. –5 ☐ +2 10. +4 ☐ +5
11. –3 ☐ –2 12. –1 ☐ 0

Rewrite in order from largest to smallest.

13. –3, +2, +4, –7, –8

_____

14. –12, 0, –13, +3, –7

_____

15. +5, –3, 0, +1, –1

_____

Find each sum.

16. (+8) + (–5) _____
17. (+3) + (+9) _____
18. (–6) + (+2) _____
19. (–2) + (–5) _____

Subtract.

20. (+11) – (+7) _____
21. (–5) – (–2) _____
22. (–9) – (+7) _____
23. (+6) – (–8) _____

Multiply.

24. (–6) × (+3) _____
25. (+8) × (–5) _____
26. (–7) × (–2) _____
27. (+4) × (+8) _____

Divide.

28. (–12) ÷ (+4) _____
29. (+16) ÷ (–2) _____
30. (–18) ÷ (–3) _____
31. (+9) ÷ (+3) _____

Simplify.

32. (–12) + (+8) _____
33. (+6) × (–5) _____
34. (+15) ÷ (–3) _____
35. (+13) – (–4) _____
36. (–7) × (–4) _____
37. (–10) ÷ (+2) _____
38. (+9) + (–11) _____
39. (–8) – (+5) _____
40. (–24) ÷ (+3) _____
41. (+6) × (–8) _____
42. (–14) – (–7) _____
43. (+8) + (–15) _____

44. Shona earned $44.00, spent $23.00, loaned her brother $5.00, and then earned another $26.00. How much money did she have then?

_____

Name _____

Test Two CHAPTER 10: Integers

MATHPOWER™ *Seven*, pp. 341–365

Write each of the following as an integer.

1. a loss of fifty points _____
2. seventy metres below sea level _____
3. thirty-six dollars earned _____

Write the next three integers.

4. +7, +5, +3, _____, _____, _____
5. –12, –8, –4, _____, _____, _____
6. –1, +4, +9, _____, _____, _____

Insert > or < to make each statement true.

7. +2 ☐ –3
8. +4 ☐ +8
9. –3 ☐ 0
10. –2 ☐ –6
11. +5 ☐ +3
12. 0 ☐ +4

Rewrite in order from smallest to largest.

13. +4, –2, –6, +3, 0, –4

_____

14. –1, –4, +7, +2, –3, +4

_____

15. +2, –5, –3, 0, –7, +9

_____

Write the opposite of each integer.

16. –10 _____
17. +14 _____
18. –23 _____

Add.

19. (–4) + (–6) _____
20. (+6) + (–3) _____
21. (–2) + (+9) _____
22. (+2) + (+7) _____

Subtract.

23. (–6) – (–4) _____
24. (+8) – (+11) _____
25. (–7) – (+8) _____
26. (+3) – (–4) _____

Multiply.

27. (+3) × (–8) _____
28. (–4) × (–7) _____
29. (+5) × (+7) _____
30. (–6) × (+8) _____

Divide.

31. (–21) ÷ (–3) _____
32. (+44) ÷ (–11) _____
33. (–18) ÷ (+2) _____
34. (+27) ÷ (+9) _____

Find the missing integer.

35. (–8) + ☐ = –3
36. ☐ – (–4) = +5
37. ☐ ÷ (+4) = –3
38. (+6) × ☐ = +42
39. (–6) – ☐ = –11
40. ☐ + (+2) = +1
41. ☐ × (–9) = +63
42. (+56) ÷ ☐ = –7

43. The low temperatures for 1 week in Hamilton, Ontario, were –12°C, –10°C, –15°C, –7°C, 0°C, –7°C, and –5°C. What was the average low temperature for that week?

_____

Name _____

Extension CHAPTER 10: Integers

MATHPOWER™ *Seven*, pp. 341–365

Complete the chart.

	Starting Temperature (°C)	Change (°C)	Final Temperature (°C)
1.	+9	down 5	
2.	–7	up 11	
3.	–3	down 6	
4.	+15	down 18	
5.	–14	up 20	
6.	+10	up 14	
7.	+4	down 8	
8.	–11	down 9	

Use the following letters to answer questions 9–15.

S	T	O	I	P	I	E	V
–7	+3	–14	+6	–18	–2	+17	+7

9. Which letter has the smallest value?

_____

10. Which letter has the greatest value?

_____

11. Which letters have opposite values?

_____

12. What is the sum of the values of the letter I?

_____

13. What are the two possible differences between the values for the letter I?

_____

14. What is the average value of all the letters?

_____

15. What word is formed when the letters are arranged from smallest to largest?

_____

Complete the charts. The first box in each chart is completed for you as an example.

	Add.	–6	–5	+3	+10	–15
16.	–1	–7				
17.	–7					
18.	+18					
19.	–13					
20.	–6					

	Subtract.	+3	–5	+10	–7	–3
21.	–5	+8				
22.	+17					
23.	–21					
24.	+6					
25.	–13					

	Multiply.	–3	+7	+9	–6	–1
26.	+6	–18				
27.	–8					
28.	+4					
29.	+10					
30.	–7					

	Divide.	–20	+60	+40	–80	+100
31.	–2	+10				
32.	+4					
33.	–5					
34.	+10					
35.	–1					

36. In a magic square, the sum of the numbers in each column, row, and diagonal is the same. Find the magic number and complete the magic square.

+4		+2
–1		
0		

Name _____

11.1 Variables in Expressions

MATHPOWER™ *Seven*, pp. 370–371

The value of an **expression** is found by **substituting** a value for the **variable**.

Calculate $2x$ for $x = 5$.

$2x = 2 \times 5$

$= 10$

Calculate $4y - 2$ for $y = 3$.

$4y - 2 = 4 \times 3 - 2$

$= 12 - 2$

$= 10$

Evaluate the following.

1. $x + 3, x = 6$ _____

2. $y - 7, y = 9$ _____

3. $7p, p = 3$ _____

4. $8 + n, n = 0$ _____

5. $4m + 5, m = 4$ _____

6. $7x - 4, x = 5$ _____

7. $19 - 3y, y = 2$ _____

8. $11 + 3z, z = 4$ _____

Find the value of each expression for $x = 3$.

9. $6x$ _____

10. $12x$ _____

11. $3x + 5$ _____

12. $4x - 6$ _____

13. $15 - x$ _____

14. $7 + 5x$ _____

15. $24 \div x$ _____

16. $27 \div 3x$ _____

Evaluate the expressions for $m = 6$ and $n = 2$.

17. $7m$ _____

18. $6n$ _____

19. mn _____

20. $3m - 6$ _____

21. $5n - 3$ _____

22. $m + n$ _____

23. $4(m - n)$ _____

24. $2mn$ _____

25. $6n - m$ _____

26. $5mn - 19$ _____

Given $x = 0.2$ and $y = 0.6$, evaluate the expressions.

27. $30x$ _____

28. $20y$ _____

29. $2xy$ _____

30. $20x + 10y$ _____

31. $5y - 10x$ _____

32. $12 - 4x - 3y$ _____

33. $7x - y$ _____

34. $8 + 2x + 2y$ _____

Evaluate these expressions for $x = 8$ and $y = 12$.

35. $\frac{y}{3}$ _____

36. $\frac{x}{2}$ _____

37. $\frac{xy}{6}$ _____

38. $\frac{y}{6} + \frac{x}{4}$ _____

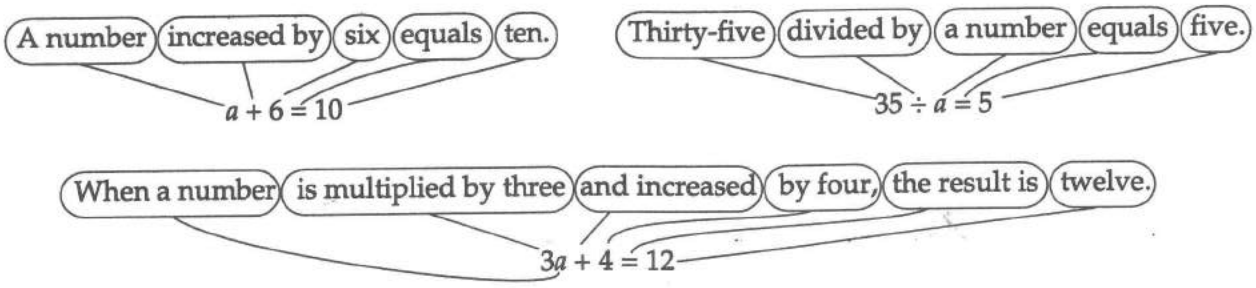
39. $\frac{24}{x} - 1$ _____

40. $\frac{y + 2}{7}$ _____

Name _____

11.2 Words and Symbols

MATHPOWER™ *Seven*, pp. 372–373



Write an expression to represent each statement.

1. a number decreased by 5 _____
2. the sum of 6 and a number _____
3. a number increased by 3 _____
4. 4 divided by a number _____
5. 7 multiplied by a number _____
6. a number divided by 2 _____
7. a number subtracted from 10 _____

The variable y represents a number. Write the words than can be represented by each expression.

8. $y - 2$

_____

9. $y + 3$

_____

10. $9y$

_____

11. $\frac{y}{5}$

_____

12. $8 + y$

_____

13. $\frac{4}{y} - 1$

_____

Write each of the following using symbols.

14. x multiplied by 9 _____
15. 12 divided by n _____
16. 11 increased by z _____
17. y decreased by 5 _____

Write an expression for each of the following.

18. Maurice's height decreased by six centimetres

_____

19. eight times the number of horses

_____

20. Jayne's age four years from now

_____

21. an amount of money divided by three

_____

22. one-quarter the width of the desk

_____

23. two sizes smaller than Mario's shoe size

_____

24. $18.00/h for a number of hours worked

_____

Name _____

11.3 Solving Equations

MATHPOWER™ *Seven*, pp. 374–375

Solve $x + 8 = 14$.
Since $6 + 8 = 14$, then $x = 6$.
$x = 6$ is the solution.

Solve $8x = 56$.
Since $8 \times 7 = 56$, then $x = 7$.
$x = 7$ is the solution.

Solve each equation.

1. $x + 5 = 9$ _____

2. $x + 3 = 12$ _____

3. $n + 6 = 15$ _____

4. $n + 7 = 11$ _____

5. $y + 4 = 7$ _____

6. $y + 8 = 14$ _____

Solve each equation.

7. $x - 2 = 9$ _____

8. $x - 4 = 12$ _____

9. $n - 9 = 3$ _____

10. $m - 5 = 8$ _____

11. $n - 1 = 7$ _____

12. $m - 3 = 0$ _____

Solve each equation for x.

13. $2x = 12$ _____

14. $5x = 25$ _____

15. $6x = 18$ _____

16. $8x = 16$ _____

17. $3x = 15$ _____

18. $4x = 28$ _____

19. $10x = 20$ _____

20. $12x = 108$ _____

Solve each equation for y.

21. $y + 4 = 3$ _____

22. $y + 6 = 7$ _____

23. $y + 5 = 3$ _____

24. $\frac{y}{2} = 3$ _____

25. $\frac{y}{6} = 2$ _____

26. $\frac{y}{8} = 3$ _____

Solve.

27. $x + 5 = 7$ _____

28. $3y = 18$ _____

29. $m + 2 = 7$ _____

30. $n - 6 = 7$ _____

31. $7y = 21$ _____

32. $\frac{x}{7} = 5$ _____

Solve each equation.

33. $3x + 2 = 8$ _____

34. $4x - 3 = 13$ _____

35. $6m - 7 = 5$ _____

36. $2y + 5 = 19$ _____

Find the correct value for each variable.

37. $x + 1.4 = 2.7$ _____

38. $y - 2.3 = 1.4$ _____

39. $2m = 6.8$ _____

40. $5x = 5.5$ _____

Name _____

11.3 Solving Equations

MATHPOWER™ *Seven*, pp. 374–375

Solve $x + 8 = 14$.
Since $6 + 8 = 14$, then $x = 6$.
$x = 6$ is the solution.

Solve $8x = 56$.
Since $8 \times 7 = 56$, then $x = 7$.
$x = 7$ is the solution.

Solve each equation.

1. $x + 5 = 9$ _____

2. $x + 3 = 12$ _____

3. $n + 6 = 15$ _____

4. $n + 7 = 11$ _____

5. $y + 4 = 7$ _____

6. $y + 8 = 14$ _____

Solve each equation.

7. $x - 2 = 9$ _____

8. $x - 4 = 12$ _____

9. $n - 9 = 3$ _____

10. $m - 5 = 8$ _____

11. $n - 1 = 7$ _____

12. $m - 3 = 0$ _____

Solve each equation for x.

13. $2x = 12$ _____

14. $5x = 25$ _____

15. $6x = 18$ _____

16. $8x = 16$ _____

17. $3x = 15$ _____

18. $4x = 28$ _____

19. $10x = 20$ _____

20. $12x = 108$ _____

Solve each equation for y.

21. $y \div 4 = 3$ _____

22. $y \div 6 = 7$ _____

23. $y \div 5 = 3$ _____

24. $\frac{y}{2} = 3$ _____

25. $\frac{y}{6} = 2$ _____

26. $\frac{y}{8} = 3$ _____

Solve.

27. $x + 5 = 7$ _____

28. $3y = 18$ _____

29. $m \div 2 = 7$ _____

30. $n - 6 = 7$ _____

31. $7y = 21$ _____

32. $\frac{x}{7} = 5$ _____

Solve each equation.

33. $3x + 2 = 8$ _____

34. $4x - 3 = 13$ _____

35. $6m - 7 = 5$ _____

36. $2y + 5 = 19$ _____

Find the correct value for each variable.

37. $x + 1.4 = 2.7$ _____

38. $y - 2.3 = 1.4$ _____

39. $2m = 6.8$ _____

40. $5x = 5.5$ _____

Name _____

11.3 Solving Equations

MATHPOWER™ *Seven*, pp. 374–375

Solve $x + 8 = 14$.
Since $6 + 8 = 14$, then $x = 6$.
$x = 6$ is the solution.

Solve $8x = 56$.
Since $8 \times 7 = 56$, then $x = 7$.
$x = 7$ is the solution.

Solve each equation.

1. $x + 5 = 9$ _____

2. $x + 3 = 12$ _____

3. $n + 6 = 15$ _____

4. $n + 7 = 11$ _____

5. $y + 4 = 7$ _____

6. $y + 8 = 14$ _____

Solve each equation.

7. $x - 2 = 9$ _____

8. $x - 4 = 12$ _____

9. $n - 9 = 3$ _____

10. $m - 5 = 8$ _____

11. $n - 1 = 7$ _____

12. $m - 3 = 0$ _____

Solve each equation for x.

13. $2x = 12$ _____

14. $5x = 25$ _____

15. $6x = 18$ _____

16. $8x = 16$ _____

17. $3x = 15$ _____

18. $4x = 28$ _____

19. $10x = 20$ _____

20. $12x = 108$ _____

Solve each equation for y.

21. $y + 4 = 3$ _____

22. $y + 6 = 7$ _____

23. $y + 5 = 3$ _____

24. $\frac{y}{2} = 3$ _____

25. $\frac{y}{6} = 2$ _____

26. $\frac{y}{8} = 3$ _____

Solve.

27. $x + 5 = 7$ _____

28. $3y = 18$ _____

29. $m \div 2 = 7$ _____

30. $n - 6 = 7$ _____

31. $7y = 21$ _____

32. $\frac{x}{7} = 5$ _____

Solve each equation.

33. $3x + 2 = 8$ _____

34. $4x - 3 = 13$ _____

35. $6m - 7 = 5$ _____

36. $2y + 5 = 19$ _____

Find the correct value for each variable.

37. $x + 1.4 = 2.7$ _____

38. $y - 2.3 = 1.4$ _____

39. $2m = 6.8$ _____

40. $5x = 5.5$ _____

Name _____

11.3 Solving Equations

MATHPOWER™ *Seven*, pp. 374–375

Solve $x + 8 = 14$.
Since $6 + 8 = 14$, then $x = 6$.
$x = 6$ is the solution.

Solve $8x = 56$.
Since $8 \times 7 = 56$, then $x = 7$.
$x = 7$ is the solution.

Solve each equation.

1. $x + 5 = 9$ _____
2. $x + 3 = 12$ _____
3. $n + 6 = 15$ _____
4. $n + 7 = 11$ _____
5. $y + 4 = 7$ _____
6. $y + 8 = 14$ _____

Solve each equation.

7. $x - 2 = 9$ _____
8. $x - 4 = 12$ _____
9. $n - 9 = 3$ _____
10. $m - 5 = 8$ _____
11. $n - 1 = 7$ _____
12. $m - 3 = 0$ _____

Solve each equation for x.

13. $2x = 12$ _____
14. $5x = 25$ _____
15. $6x = 18$ _____
16. $8x = 16$ _____
17. $3x = 15$ _____
18. $4x = 28$ _____
19. $10x = 20$ _____
20. $12x = 108$ _____

Solve each equation for y.

21. $y \div 4 = 3$ _____
22. $y \div 6 = 7$ _____
23. $y \div 5 = 3$ _____
24. $\frac{y}{2} = 3$ _____
25. $\frac{y}{6} = 2$ _____
26. $\frac{y}{8} = 3$ _____

Solve.

27. $x + 5 = 7$ _____
28. $3y = 18$ _____
29. $m \div 2 = 7$ _____
30. $n - 6 = 7$ _____
31. $7y = 21$ _____
32. $\frac{x}{7} = 5$ _____

Solve each equation.

33. $3x + 2 = 8$ _____
34. $4x - 3 = 13$ _____
35. $6m - 7 = 5$ _____
36. $2y + 5 = 19$ _____

Find the correct value for each variable.

37. $x + 1.4 = 2.7$ _____
38. $y - 2.3 = 1.4$ _____
39. $2m = 6.8$ _____
40. $5x = 5.5$ _____

Name _____

11.4 Solving Equations by Subtraction
11.5 Solving Equations by Addition

MATHPOWER™ *Seven*, pp. 377–378

Solve $x + 1 = 13$.

Subtract 1 from both sides.

$x + 1 - 1 = 13 - 1$

$x = 12$

The solution is 12.

Solve $y - 4 = 7$

Add 4 to both sides.

$y - 4 + 4 = 7 + 4$

$y = 11$

The solution is 11.

What number would you subtract from both sides of each equation to solve it?

1. $x + 5 = 11$ _____
2. $y + 3 = 7$ _____
3. $z + 4 = 9$ _____
4. $m + 8 = 15$ _____
5. $n + 9 = 14$ _____

Solve each equation.

6. $y + 4 = 11$ _____
7. $x + 9 = 21$ _____
8. $m + 12 = 34$ _____
9. $n + 7 = 29$ _____
10. $x + 14 = 38$ _____
11. $y + 13 = 22$ _____

Solve.

12. $x + 4 = 6.2$ _____
13. $y + 7 = 13.4$ _____
14. $m + 3 = 11.5$ _____
15. $z + 8 = 17.9$ _____
16. $n + 5 = 23.4$ _____
17. $x + 6 = 11.8$ _____

What number would you add to both sides to solve each equation?

18. $x - 9 = 10$ _____
19. $y - 5 = 7$ _____
20. $z - 12 = 2$ _____
21. $m - 8 = 3$ _____
22. $n - 2 = 17$ _____

Solve each equation.

23. $x - 3 = 9$ _____
24. $y - 11 = 23$ _____
25. $z - 8 = 37$ _____
26. $m - 16 = 17$ _____
27. $n - 9 = 18$ _____
28. $z - 14 = 13$ _____

Solve.

29. $m - 3 = 7.2$ _____
30. $n - 2 = 15.5$ _____
31. $x - 11 = 0.8$ _____
32. $y - 9 = 8.7$ _____
33. $m - 6 = 21.8$ _____
34. $x - 8 = 1.6$ _____

Name _____

11.4 Solving Equations by Subtraction
11.5 Solving Equations by Addition

MATHPOWER™ *Seven*, pp. 377–378

Solve $x + 1 = 13$.

Subtract 1 from both sides.

$x + 1 - 1 = 13 - 1$

$x = 12$

The solution is 12.

Solve $y - 4 = 7$

Add 4 to both sides.

$y - 4 + 4 = 7 + 4$

$y = 11$

The solution is 11.

What number would you subtract from both sides of each equation to solve it?

1. $x + 5 = 11$ _____
2. $y + 3 = 7$ _____
3. $z + 4 = 9$ _____
4. $m + 8 = 15$ _____
5. $n + 9 = 14$ _____

Solve each equation.

6. $y + 4 = 11$ _____
7. $x + 9 = 21$ _____
8. $m + 12 = 34$ _____
9. $n + 7 = 29$ _____
10. $x + 14 = 38$ _____
11. $y + 13 = 22$ _____

Solve.

12. $x + 4 = 6.2$ _____
13. $y + 7 = 13.4$ _____
14. $m + 3 = 11.5$ _____
15. $z + 8 = 17.9$ _____
16. $n + 5 = 23.4$ _____
17. $x + 6 = 11.8$ _____

What number would you add to both sides to solve each equation?

18. $x - 9 = 10$ _____
19. $y - 5 = 7$ _____
20. $z - 12 = 2$ _____
21. $m - 8 = 3$ _____
22. $n - 2 = 17$ _____

Solve each equation.

23. $x - 3 = 9$ _____
24. $y - 11 = 23$ _____
25. $z - 8 = 37$ _____
26. $m - 16 = 17$ _____
27. $n - 9 = 18$ _____
28. $z - 14 = 13$ _____

Solve.

29. $m - 3 = 7.2$ _____
30. $n - 2 = 15.5$ _____
31. $x - 11 = 0.8$ _____
32. $y - 9 = 8.7$ _____
33. $m - 6 = 21.8$ _____
34. $x - 8 = 1.6$ _____

Name _____

11.6 Solving Equations by Division
11.7 Solving Equations by Multiplication

MATHPOWER™ *Seven*, pp. 379–380

Solve $11p = 88$.

$$11p = 88$$
$$\frac{11p}{11} = \frac{88}{11}$$
$$p = 8$$

The solution is 8.

Solve $\frac{m}{9} = 4$.

$$\frac{m}{9} = 4$$
$$9 \times \frac{m}{9} = 9 \times 4$$
$$m = 36$$

The solution is 36.

By what number would you divide both sides to solve each equation?

1. $4x = 8$ _____

2. $6y = 18$ _____

3. $7z = 21$ _____

4. $5m = 25$ _____

5. $8n = 48$ _____

Solve each equation.

6. $9p = 36$ _____

7. $5m = 35$ _____

8. $2n = 26$ _____

9. $11z = 55$ _____

10. $13x = 52$ _____

11. $8y = 72$ _____

Solve.

12. $4x = 3.2$ _____

13. $7y = 14.7$ _____

14. $3z = 21.9$ _____

15. $6m = 3.6$ _____

16. $5p = 4.5$ _____

17. $8n = 6.4$ _____

18. $10n = 25$ _____

19. $12n = 9.6$ _____

By what number would you multiply both sides to solve each equation?

20. $\frac{x}{4} = 6$ _____

21. $\frac{y}{7} = 3$ _____

22. $\frac{z}{5} = 4$ _____

23. $\frac{p}{6} = 2$ _____

24. $\frac{r}{2} = 4$ _____

Solve each equation.

25. $\frac{m}{8} = 4$ _____

26. $\frac{p}{7} = 6$ _____

27. $\frac{r}{4} = 6$ _____

28. $\frac{x}{9} = 5$ _____

Solve.

29. $\frac{p}{2} = 4.3$ _____

30. $\frac{r}{5} = 2.4$ _____

31. $\frac{m}{8} = 1.7$ _____

32. $\frac{n}{4} = 3.1$ _____

33. $\frac{x}{6} = 1.5$ _____

34. $\frac{y}{9} = 0.3$ _____

Name _____

11.8 Solving Equations in Two Steps

MATHPOWER™ *Seven*, p. 381

Some equations need to be solved in two steps.

Solve $8x - 5 = 27$.

Step 1. Add 5 to both sides.

$$\begin{aligned} 8x - 5 &= 27 \\ 8x - 5 + 5 &= 27 + 5 \\ 8x &= 32 \end{aligned}$$

Step 2. Divide both sides by 8.

$$\begin{aligned} \frac{8x}{8} &= \frac{32}{8} \\ x &= 4 \end{aligned}$$

The solution is 4.

Solve each equation.

1. $3x + 2 = 14$

2. $4n - 1 = 19$

3. $5t + 6 = 21$

4. $3x - 6 = 15$

5. $2p + 4 = 16$

6. $2x - 5 = 13$

7. $4t + 7 = 11$

8. $5y - 7 = 33$

9. $6n + 8 = 20$

10. $6p - 8 = 16$

11. $7y + 3 = 38$

12. $8m - 11 = 13$

13. $8m + 1 = 49$

14. $9z - 9 = 9$

15. $9z + 4 = 31$

16. $7r - 4 = 38$

17. $3x + 2 = 5 + 3$

18. $4m + 5 = 11 + 6$

19. $2y - 1 = 12 - 3$

20. $5r - 9 = 7 + 4$

21. $8z + 4 = 23 - 11$

22. $6a - 2 = 19 - 3$

Solve.

23. $4x + 1.3 = 13.3$

24. $3y - 2.1 = 9.9$

25. $2z + 3.4 = 17.4$

26. $6p - 7.6 = 10.4$

27. $3x + 2.8 = 11.8$

28. $2r - 5.3 = 10.7$

29. $5p + 0.8 = 20.8$

30. $4x - 9.2 = 18.8$

31. $7t - 1.8 = 3.1$

32. $9x + 1.4 = 5.9$

Name _____

11.9 Writing and Reading Equations

MATHPOWER™ *Seven*, pp. 382–383

Choose the correct equation from the box below.

1. Two added to a number is eight.

_____

2. A number divided by seven is four.

_____

3. A number decreased by three is eleven.

_____

4. Five subtracted from a number is nine.

_____

5. Thirteen added to a number is eighteen.

_____

6. A number multiplied by four is sixteen.

_____

$x - 3 = 11$	$4z = 16$	$\frac{x}{7} = 4$
	$x + 2 = 8$	
$p + 13 = 18$	$x - 4 = 7$	$y - 5 = 9$

Write an equation for each statement.

7. A number multiplied by 6 is 18.

_____

8. A number decreased by 3 is 4.

_____

9. A number divided by 2 is 9.

_____

10. A number decreased by 5 is 11.

_____

11. Sixteen divided by a number is 4.

_____

Write each of the following in words.

12. $x - 7 = 14$

_____

13. $\frac{z}{2} = 5$

_____

14. $4x = 28$

_____

15. $x + 9 = 26$

_____

Write an equation for each of the following.

16. The length of the parking lot divided by fifteen is three metres.

_____

17. Eight times the number of students is 216.

_____

18. Mia's age 7 years from now will be 21.

_____

19. Fifty-five kilometres less than a distance is one thousand kilometres.

_____

20. The number of pages in a book decreased by 12 is 470.

_____

21. When Raj reads 5 more pages, he will be on page 65.

_____

22. Write and solve an equation for each of the following.

a) The height of a figure is 5 cm more than the base. The base is 7 cm.

_____

b) Omar scored 4 times as many goals as Brent. Omar scored 36 goals.

_____

Name _____

11.10 Using Equations to Solve Problems

MATHPOWER™ *Seven*, pp. 384–385

Find the following numbers.

1. When a number is tripled, the result is 39.

_____ _____

2. When a number is increased by 7, the result is 15.

_____ _____

3. The product of 6 and a number is 18.

_____ _____

4. The difference between a number and 4 is 11.

_____ _____

5. One-seventh of a number is 3.

_____ _____

6. When a number is added to 13, the result is 21.

_____ _____

7. When a number is subtracted from 16, the result is 5.

_____ _____

8. When a number is divided by 2, the quotient is 8.

_____ _____

Write an equation for each problem and solve.

9. The sum of 2 numbers is 17. The second number is 3 more than the first. What are the 2 numbers?

_____

_____

10. Elena earned $156.25 at $6.25/h. How many hours did she work?

_____

_____

11. Erik read 23 pages of his book and stopped at page 49. At what page did he start reading?

_____

_____

12. The difference between 2 numbers is 18. One number is 4 times as great as the other. What are the 2 numbers?

_____

_____

13. Marc has 3 times more mass than his younger sister. His sister has a mass of 16 kg. What is Marc's mass?

_____

_____

14. Marilyn deposited her allowance in the bank, and her account balance changed from $245.60 to $261.10. How much was her allowance?

_____

_____

15. The area of a rectangle is 108 cm^2. If its length is 12 cm, what is its width?

_____

_____

16. The perimeter of a rectangle is 46 cm. The length is 13 cm. What is the width?

_____

_____

17. The sum of 3 numbers is 16. The first is double the second. The third is 1 more than the first. What are the 3 numbers?

_____

_____

18. At the end of the month, Class 7B had half as many absences as Class 7A. Altogether, the students in Class 7A had been absent 12 days. How many days were the students absent in Class 7B?

_____

_____

Name _____

11.11 Inequalities

MATHPOWER™ *Seven*, pp. 386–387

Sign	Words	Sign	Words
=	equal to	≠	not equal to
<	less than	>	greater than
≤	less than or equal to	≥	greater than or equal to

State whether each of the following statements is true or false.

1. $7 + 4 > 12$ _____ **2.** $6 \times 4 = 24$ _____

3. $9 - 2 > 6$ _____ **4.** $31 - 16 \neq 15$ _____

5. $10 - 3 < 8$ _____ **6.** $6 - 2 \leq 4$ _____

7. $4 + 13 \geq 17$ _____

8. $7 + 9 > 15 + 2$ _____

9. $5 + 7 = 36 \div 3$ _____

The variables are whole numbers from 0 to 10. Write each solution.

10. $x > 3$ _____

11. $y \leq 8$ _____

12. $p \neq 5$ _____

13. $r < 4$ _____

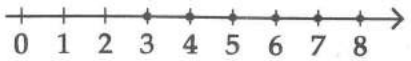
14. $m - 3 \geq 0$ _____

15. $2n < 14$ _____

16. $p + 2 > 4$ _____

Write two inequalities using x for each graph.

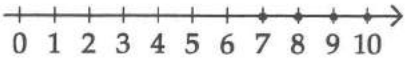
17.



_____

_____

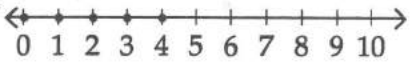
18.



_____

_____

19.

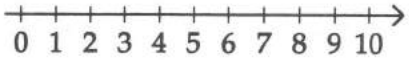


_____

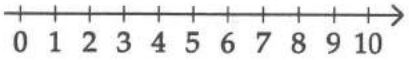
_____

The variables are whole numbers from 0 to 10. Solve each inequality and graph its solution on the number line.

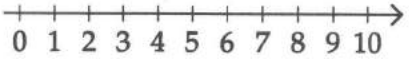
20. $x > 5$ _____



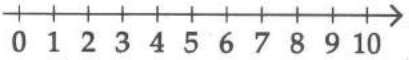
21. $x \leq 8$ _____



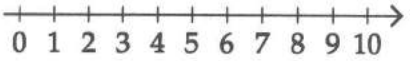
22. $x < 7$ _____



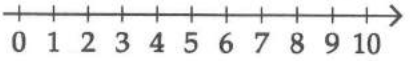
23. $x \neq 3$ _____



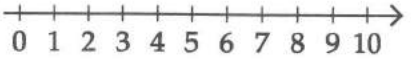
24. $x \geq 3$ _____



25. $x - 1 > 2$ _____



26. $x + 5 < 11$ _____



Name _____

11.12 Tables of Values
11.13 Ordered Pairs

MATHPOWER™ *Seven*, pp. 388–393

$x + y = 6$, $x = 0, 1, 2$, and 3

Table of Values		Ordered Pairs
x	y	
0	6	(0, 6)
1	5	(1, 5)
2	4	(2, 4)
3	3	(3, 3)

Complete the tables for the given values of x.

1.

x	$x + 4$
1	
2	
3	
4	
5	

2.

x	$3x + 2$
1	
2	
3	
4	
5	

3.

x	$2x - 1$
0	
3	
	9
	1
6	

4.

x	$x - 7$
	–5
4	
0	
	0
9	

Evaluate each expression for the given values of x.

5. $3x + 3$, $x = 1, 2, 3$, and 4

_____

6. $\frac{x}{3}$, $x = 3, 6, 9$, and 12

_____

7. $15 - 2x$, $x = 2, 4, 6$, and 8

_____

8. Michel helped sell hamburgers and juice at the school bazaar. To calculate the cost, he constructed the following tables. Complete the tables.

a) $1.75x$

Number of Hamburgers (x)	Cost ($)
1	
2	
3	
4	
5	

b) $0.95y$

Number of Juices (y)	Cost ($)
1	
2	
3	
4	
5	

9. Complete the tables for the given equations. Write the solutions as ordered pairs.

a) $x + y = 9$

x	y
0	
1	
2	
3	
4	

b) $x - y = 4$

x	y
8	
4	
5	
9	
7	

_____ _____

_____ _____

10. Find 5 ordered pairs that are solutions for each of the following equations.

a) $x + y = 13$

_____

_____

b) $y - x = 3$

_____

_____

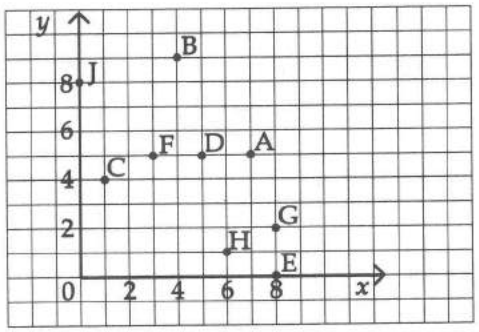
Name _____

11.14 The Coordinate Plane

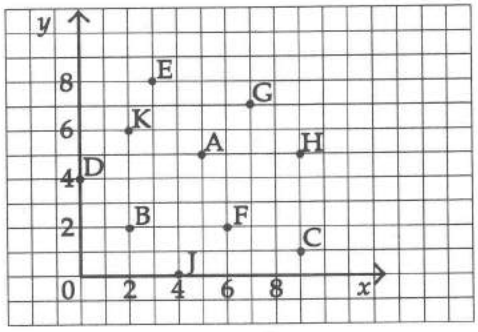
MATHPOWER™ *Seven*, pp. 394–395

Write the letter of the point named by each ordered pair.

1. (1, 4) _____
2. (3, 5) _____
3. (6, 1) _____
4. (4, 9) _____
5. (5, 5) _____
6. (8, 2) _____
7. (7, 5) _____
8. (0, 8) _____



State the coordinates of each point on the graph.

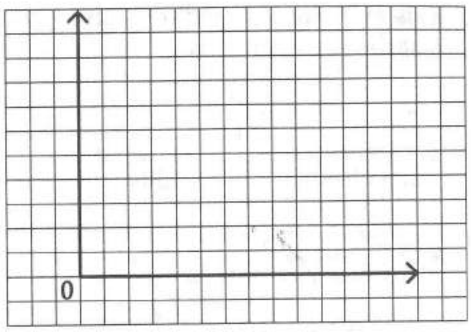


9. A _____
10. B _____
11. C _____
12. D _____
13. E _____
14. F _____
15. G _____
16. H _____
17. J _____
18. K _____

19. a) Plot the points A(2, 2), B(5, 5), C(9, 5), and D(6, 2) on the grid provided.

b) Join the points in the order ABCDA.

c) Name the figure. _____



20. a) Complete each table of values.

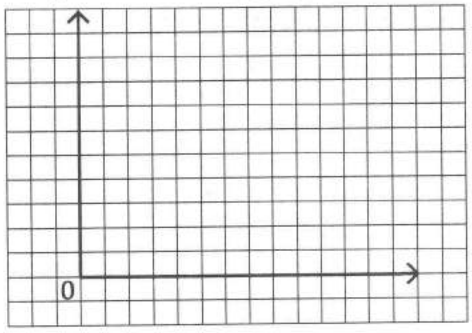
$x + y = 10$

x	y

$x - y = 2$

x	y

b) Use the values in each table to make ordered pairs, and then graph.



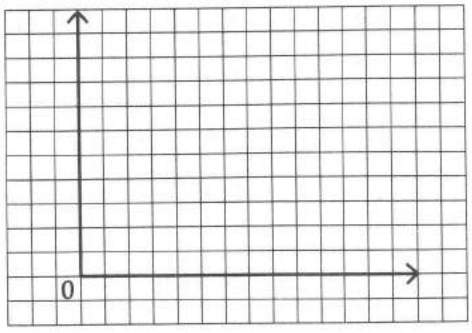
21. Find 4 ordered pairs that are solutions for each equation.

a) $x - y = 0$ _____

b) $x + y = 9$ _____

c) $y - x = 1$ _____

22. Graph each set of points in question 21. Join the points in each set.

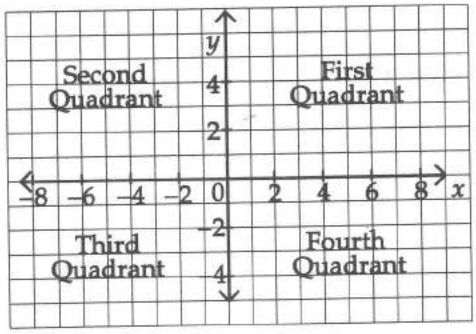


Name _____

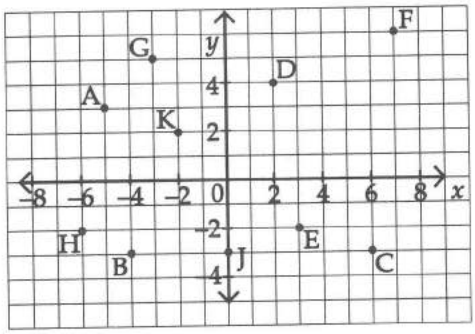
11.15 Graphing Ordered Pairs

MATHPOWER™ *Seven*, pp. 396–397

The x-axis and the y-axis divide the grid into 4 quadrants as shown.



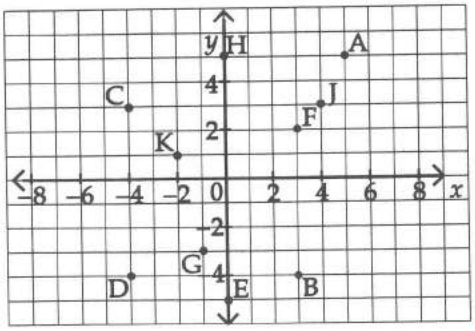
Name the coordinates of each point on the grid.



1. A _____
2. B _____
3. C _____
4. D _____
5. E _____
6. F _____
7. G _____
8. H _____
9. J _____
10. K _____

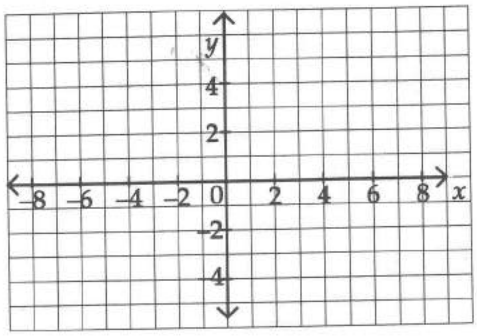
Name the points with the following coordinates on the grid below.

11. (–2, 1) _____
12. (3, 2) _____
13. (0, –5) _____
14. (0, 5) _____
15. (3, –4) _____
16. (–4, 3) _____
17. (–1, –3) _____
18. (4, 3) _____
19. (5, 5) _____
20. (–4, –4) _____



21. Plot the points D(–3, –1), E(1, 3), F(5, –1), and G(1, –5) on a grid. Join the points in order to form a figure. Identify the figure.

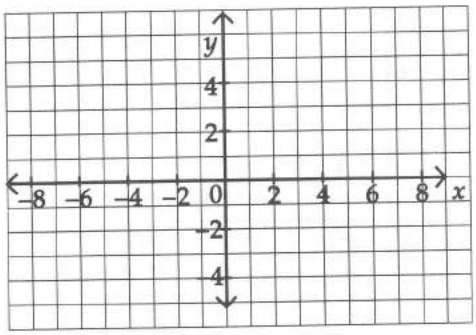
_____



22. Plot the points A(–3, 2), B(–3, –3), C(6, –3), and D(6, 2) on a grid. Join the points in order to form a figure. Identify the figure and calculate its area in square units.

_____

_____



23. In which quadrants are the following points located?

a) P(2, 6) _____
b) Q(–1, 4) _____
c) R(3, –1) _____
d) A(–2, –2) _____
e) F(–3, –2) _____
f) B(1, 1) _____
g) D(5, –8) _____
h) C(–4, 6) _____

Name _____

Test One CHAPTER 11: Algebra

MATHPOWER™ *Seven*, pp. 367–403

Write an expression to represent each phrase.

1. a number multiplied by 7 _____
2. the sum of 4 and a number _____
3. 8 divided by a number _____
4. a number decreased by 3 _____

Evaluate each expression for $x = 2$ and $y = 4$.

5. $3x + 3y$ _____
6. $5y - 6x$ _____
7. $2xy + 4$ _____
8. $8x - xy$ _____

Solve each equation for x.

9. $x + 7 = 19$ _____
10. $3x - 3 = 6$ _____
11. $\frac{x}{3} = 7$ _____
12. $4x = 24$ _____
13. $x + 3 = 8.4$ _____
14. $2x + 2 = 12.4$ _____
15. $6x = 18.6$ _____
16. $\frac{x}{4} = 7.2$ _____

For each problem, write an equation and solve.

17. A number increased by 8 equals 27. What is the number?

_____ _____

18. Six times a number is 108. What is the number?

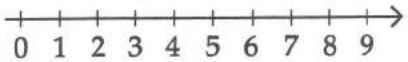
_____ _____

19. When a sum of money is divided among 4 people, each receives $22.40. What is the sum of money?

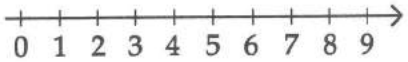
_____ _____

20. The variables are whole numbers. Graph the solution to each inequality.

a) $x \geq 2$



b) $x < 8$

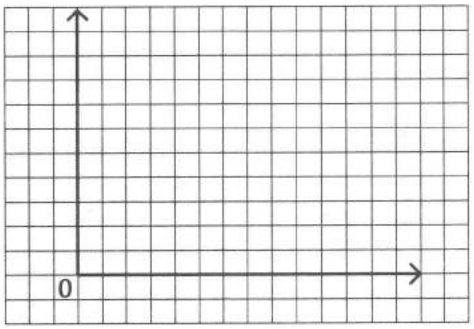


c) $x \neq 5$

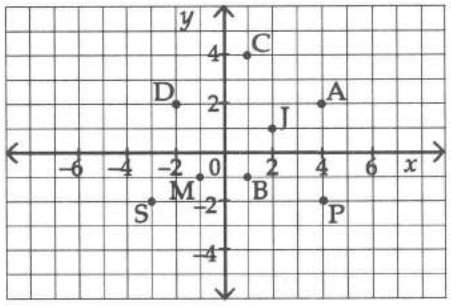
21. a) Complete the table of values for the equation $x - y = 4$.

x	y
4	
5	
6	
7	
8	

b) Use the values in the table to make ordered pairs, and then graph.



22.



a) Write the point for each pair of coordinates.

(–1, –1) _____ (4, –2) _____

(–3, –2) _____ (2, 1) _____

b) Write the coordinates for each point.

A _____ B _____

C _____ D _____

Name _____

Test Two CHAPTER 11: Algebra

MATHPOWER™ *Seven*, pp. 367–403

Evaluate each expression for $x = 1.2$ and $y = 3.5$.

1. $3x + 2y$ _____

2. $4x - y$ _____

3. $xy - 2$ _____

4. $y - x$ _____

Write the words that can be represented by each expression.

5. $y + 4$ _____

6. $\frac{6}{x}$ _____

7. $8z$ _____

8. $7 - y$ _____

Solve each equation for x.

9. $x + 4 = 9$ _____

10. $\frac{x}{2} = 8$ _____

11. $2x - 3 = 13$ _____

12. $3x = 24$ _____

13. $4x + 1 = 17.8$ _____

14. $7 - x = 4.1$ _____

15. $8x = 3.2$ _____

16. $\frac{x}{3} = 3.5$ _____

Write an equation, then solve each problem.

17. The sum of 2 numbers is 28. The second number is 4 more than the first. What are the 2 numbers?

_____ _____

18. The area of a rectangle is 135 cm^2. If its width is 9 cm, what is its length?

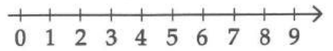
_____ _____

19. Justin read 48 pages of his book and stopped at page 104. At what page did he start reading?

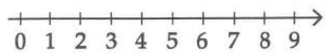
_____ _____

20. The variables are whole numbers. Graph each inequality.

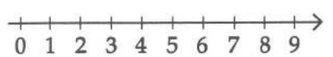
a) $x \leq 6$



b) $x > 3$



c) $x \neq 1$

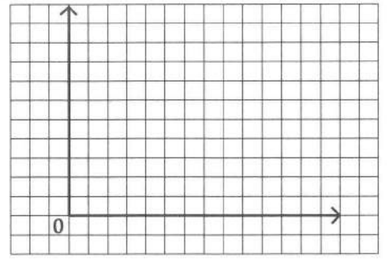


21. a) Write 5 ordered pairs for the equation $x + y = 9$.

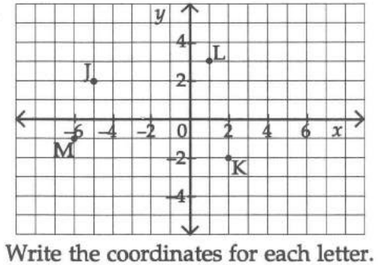
_____

_____

b) Plot the points on a grid, then join the points.



22.



a) Write the coordinates for each letter.

J _____ K _____

L _____ M _____

b) Plot the points for the following pairs of coordinates.

A(4, –2) B(–3, 0) C(–2, 2) D(7, 4) E(–5, –4)

Name _____

Test Two CHAPTER 11: Algebra

MATHPOWER™ *Seven*, pp. 367–403

Evaluate each expression for $x = 1.2$ and $y = 3.5$.

1. $3x + 2y$ _____

2. $4x - y$ _____

3. $xy - 2$ _____

4. $y - x$ _____

Write the words that can be represented by each expression.

5. $y + 4$ _____

6. $\frac{6}{x}$ _____

7. $8z$ _____

8. $7 - y$ _____

Solve each equation for x.

9. $x + 4 = 9$ _____

10. $\frac{x}{2} = 8$ _____

11. $2x - 3 = 13$ _____

12. $3x = 24$ _____

13. $4x + 1 = 17.8$ _____

14. $7 - x = 4.1$ _____

15. $8x = 3.2$ _____

16. $\frac{x}{3} = 3.5$ _____

Write an equation, then solve each problem.

17. The sum of 2 numbers is 28. The second number is 4 more than the first. What are the 2 numbers?

_____ _____

18. The area of a rectangle is 135 cm^2. If its width is 9 cm, what is its length?

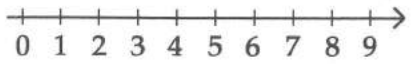
_____ _____

19. Justin read 48 pages of his book and stopped at page 104. At what page did he start reading?

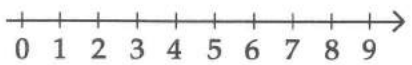
_____ _____

20. The variables are whole numbers. Graph each inequality.

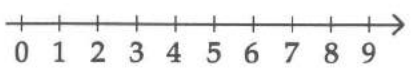
a) $x \leq 6$



b) $x > 3$



c) $x \neq 1$

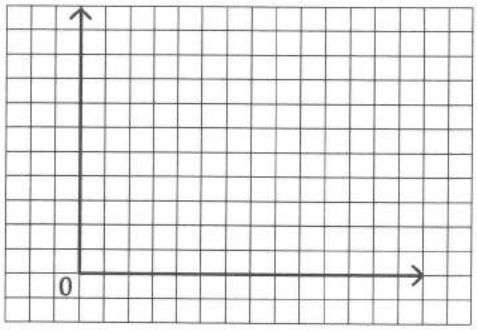


21. a) Write 5 ordered pairs for the equation $x + y = 9$.

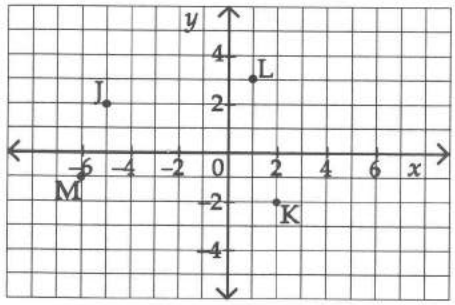
_____

_____

b) Plot the points on a grid, then join the points.



22.



a) Write the coordinates for each letter.

J _____ K _____

L _____ M _____

b) Plot the points for the following pairs of coordinates.

A(4, –2) B(–3, 0) C(–2, 2) D(7, 4) E(–5, –4)

Name _____

Extension CHAPTER 11: Algebra

MATHPOWER™ *Seven*, pp. 367–403

Complete the chart, given that $x > y$.

	x	y	$x + y$	$2x + 3y$	xy	$\frac{x+y}{2}$
1.	5	3				
2.	4		7			
3.		2			12	
4.			5		4	
5.			9		14	

6. The area of a rectangle is 150 cm^2 and the perimeter is 50 cm. Use equations to find the length and the width.

_____ _____

7. The perimeter of a square is 32 cm. Use equations to find the length of each side and the area.

_____ _____

8. Evaluate each expression for $x = 0.3$, 0.4, 0.5, and 0.6.

a) $5 + x$ _____

_____

b) $3x + 2.5$ _____

_____

c) $\frac{20x}{4}$ _____

_____

d) $10x - 1$ _____

_____

9. Evaluate each expression for

$x = \frac{2}{3}, \frac{3}{4}, \frac{4}{5}$, and $\frac{5}{6}$.

a) $4 - x$ _____

_____

b) $5x + 3$ _____

_____

c) $10 - 6x$ _____

_____

10. Complete the table of values for each equation.

a) $y = x^2 - x$

x	y
1	
3	
2	
	30
	12

b) $x = 3y + 4$

x	y
4	
	2
19	
	4
25	

11. Find an equation to represent each set of ordered pairs.

a) (0, 6), (1, 5), (2, 4), (3, 3) _____

b) (0, 1), (1, 3), (2, 5), (3, 7) _____

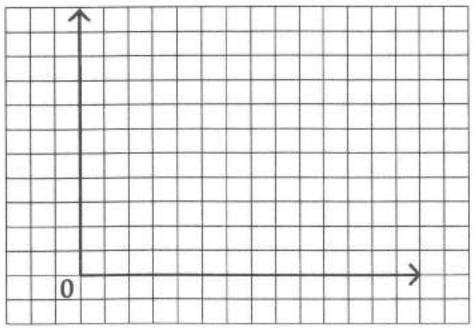
c) (1, 1), (2, 4), (3, 7), (4, 10) _____

12. A triangle has an area of 12 square units.

a) Find 4 ordered pairs for possible values of the length of the base and the height of the triangle.

_____

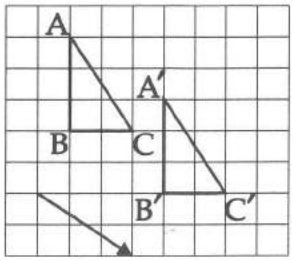
b) Graph the ordered pairs on a grid and join the points.



Name _____

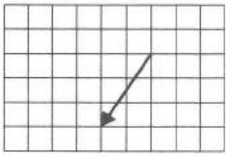
12.1 Translations

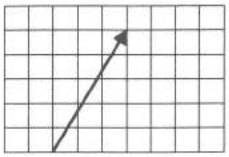
MATHPOWER™ *Seven*, pp. 412–413



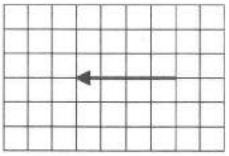
$\Delta A'B'C'$ is the translation image of ΔABC. The translation is 3 units right, 2 units down.

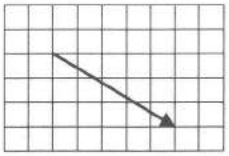
Describe the following translations.

1. 

2. 

_____ _____

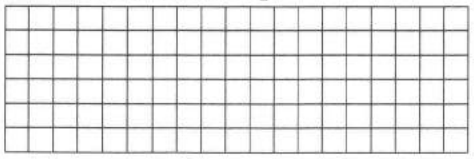
3. 

4. 

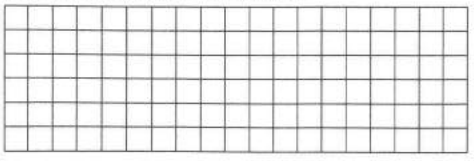
_____ _____

Draw arrows to show the following translations.

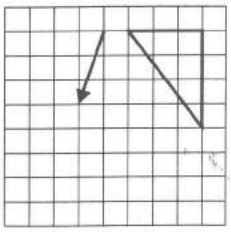
5. 2 units right, 3 units down
6. 4 units up
7. 3 units left, 4 units up

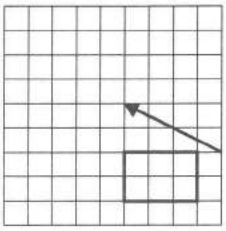


8. 3 units left
9. 1 unit right, 2 units up
10. 2 units left, 1 unit down

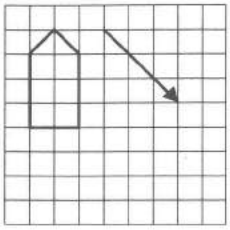


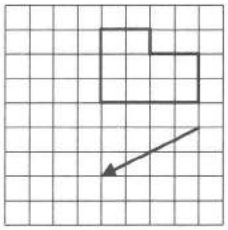
Draw the translation image for the given translation. Describe each translation.

11. 

12. 

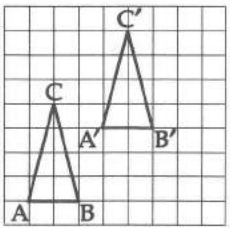
_____ _____

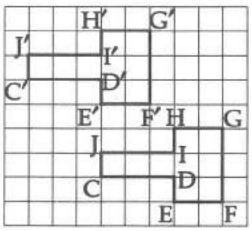
13. 

14. 

_____ _____

Draw the translation arrow and state the translation for each.

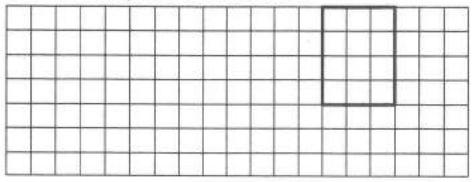
15. 

16. 

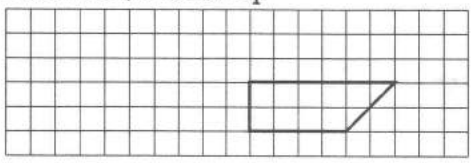
_____ _____

Draw the translation image for each given translation.

17. 7 units left, 2 units down



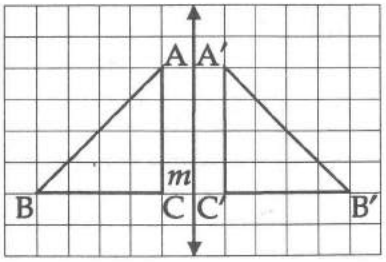
18. 2 units left, 3 units up



Name _____

12.2 Reflections

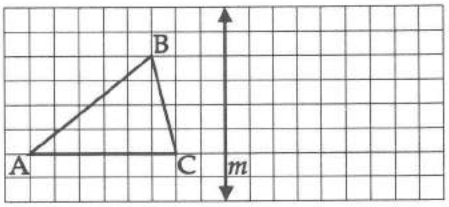
MATHPOWER™ *Seven*, pp. 414–415



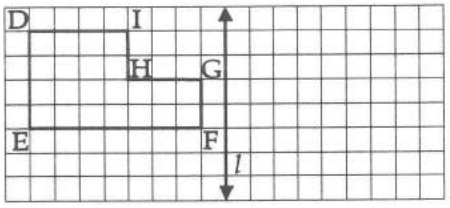
$\Delta A'B'C'$ is the reflection image of ΔABC in line m.

Draw the reflection image for each figure.

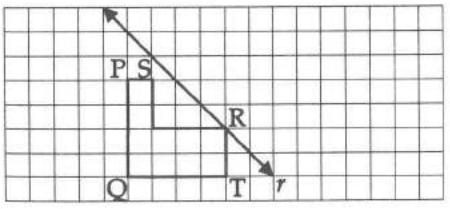
1.



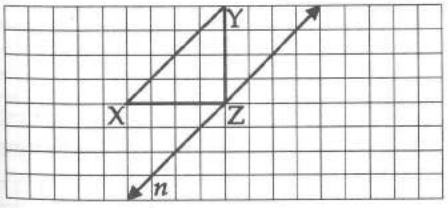
2.



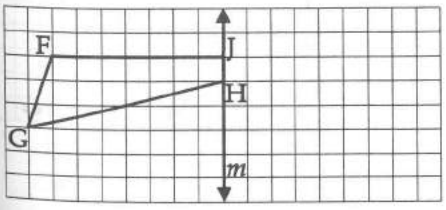
3.



4.

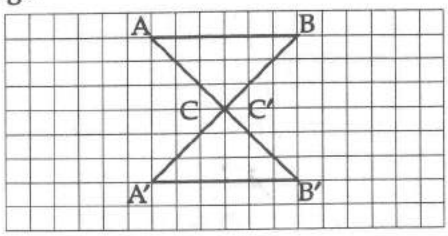


5.

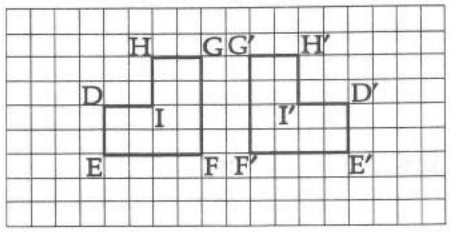


Draw the reflection line for each figure and its image.

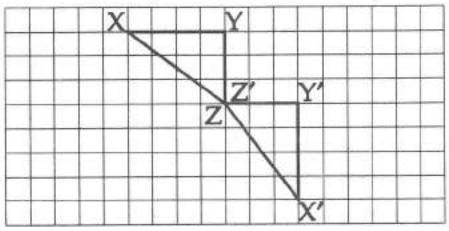
6.



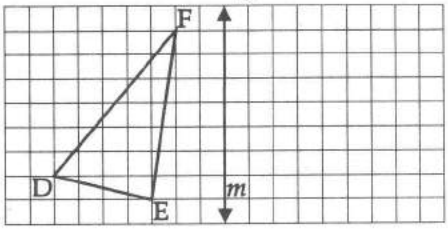
7.



8.



9. a) Draw the reflection image of ΔDEF in line m. Name the image $\Delta D'E'F'$.

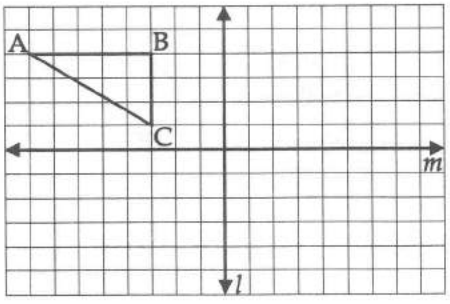


b) Name the pairs of equal angles.

c) Name the pairs of equal sides.

10. a) Reflect ΔABC in line l to give $\Delta A'B'C'$.

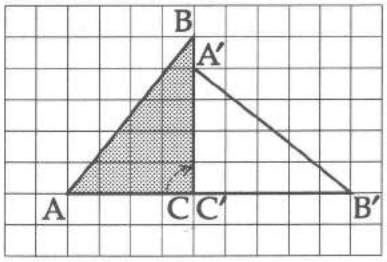
b) Reflect $\Delta A'B'C'$ in line m to give $\Delta A''B''C''$.



Name _____

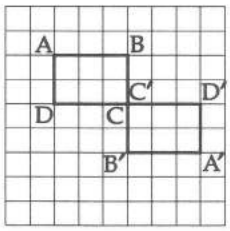
12.3 Rotations

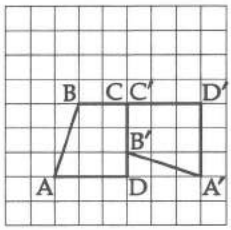
MATHPOWER™ *Seven*, pp. 416–417



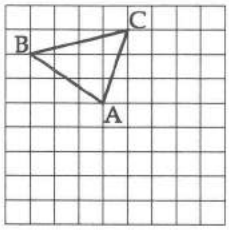
$\Delta A'B'C'$ is the rotation image of ΔABC following a rotation of 90° clockwise about C.

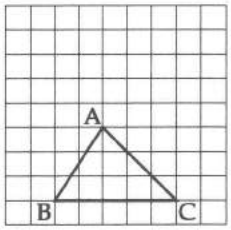
Describe a clockwise turn and a counterclockwise turn about point C that moves the figure ABCD onto the figure A′B′C′D′.

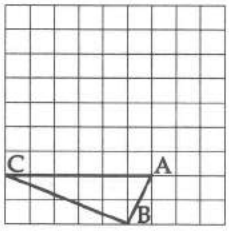
1. 

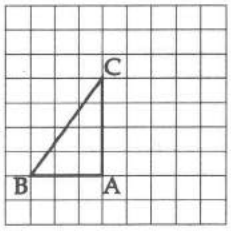
2. 

Draw the rotation image for each triangle for a 90° turn clockwise about A.

3. 

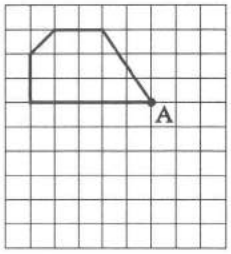
4. 

5. 

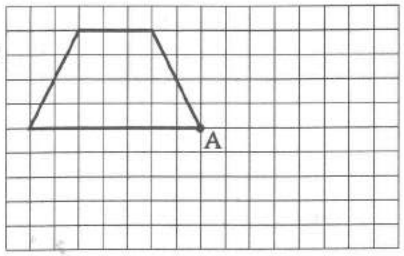
6. 

Draw the rotation image for each rotation about A.

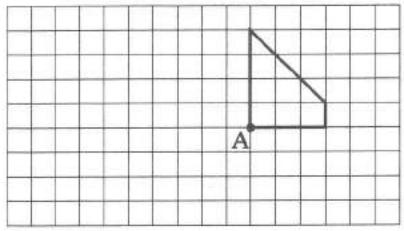
7. 90° counterclockwise



8. 180° clockwise

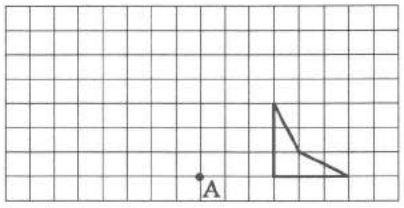


9. 270° counterclockwise

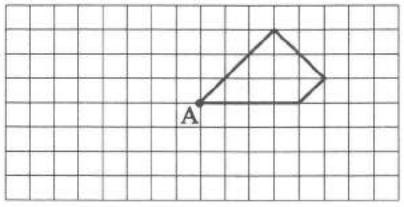


Draw the rotation image for each of the following for the given rotation and rotation centre.

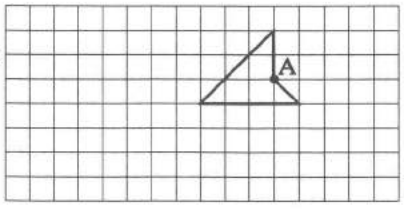
10. 90° counterclockwise



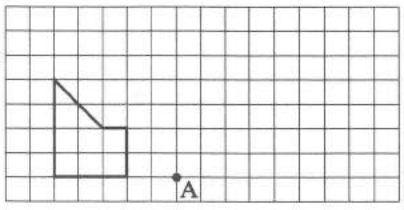
11. 180° clockwise



12. 270° clockwise



13. 90° clockwise

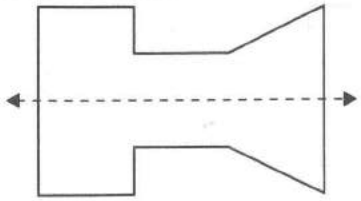


Name _____

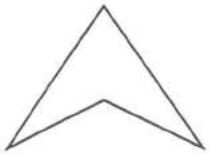
12.4 Lines of Symmetry

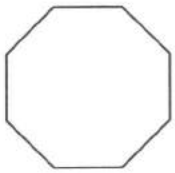
MATHPOWER™ *Seven*, pp. 420–421

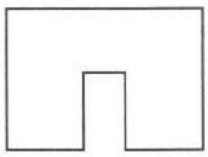
A **line of symmetry** divides a figure into two congruent parts that are reflection images of each other.

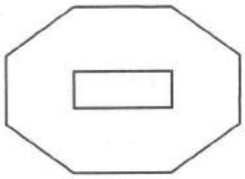


Draw all the lines of symmetry on each of the following.

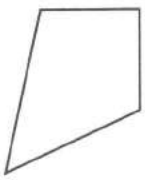
1. 

2. 

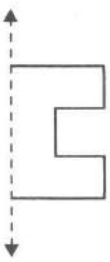
3. 

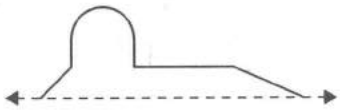
4. 

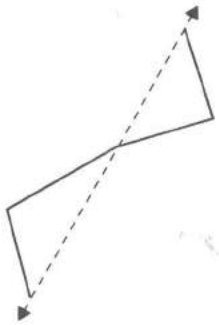
5. 

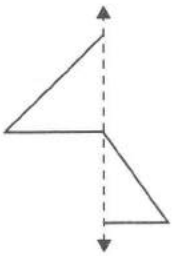
6. 

Complete each figure so that there is line symmetry.

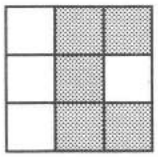
7. 

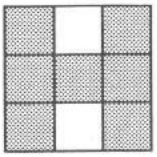
8. 

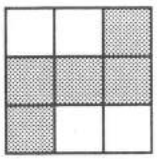
9. 

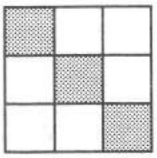
10. 

Draw all the lines of symmetry.

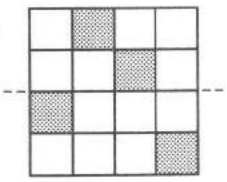
11. 

12. 

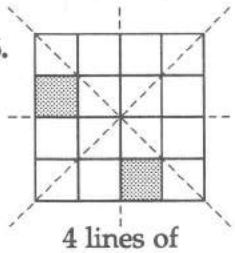
13. 

14. 

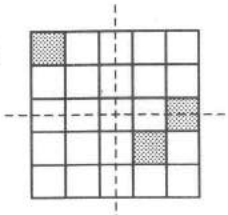
Complete the shading in each diagram so that the patterns have the given number of lines of symmetry.

15. 

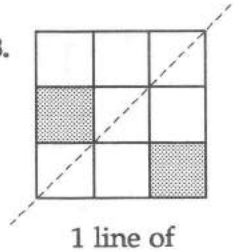
1 line of symmetry

16. 

4 lines of symmetry

17. 

2 lines of symmetry

18. 

1 line of symmetry

Name _____

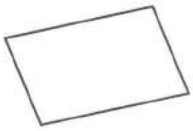
12.5 Rotational Symmetry

MATHPOWER™ *Seven*, pp. 422–423

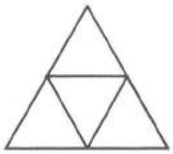
A figure that can be mapped onto itself with a turn of less than one complete rotation has **rotational symmetry.**

The "Z" has rotational symmetry of order 2.

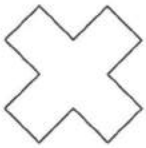
State the order of rotational symmetry for each of the following.

1. 

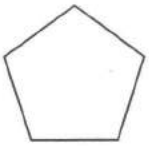
_____

2. 

_____

3. 

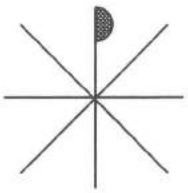
_____

4. 

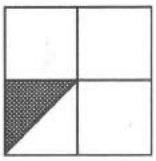
_____

Complete each figure so that it has rotational symmetry of order 4.

5. 

6. 

7. 

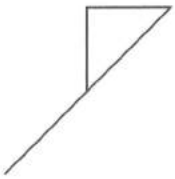
8. 

Repeat each of the following shapes in a pattern to make a figure with rotational symmetry of order 3.

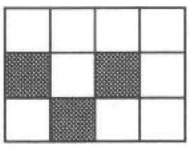
9. 

10. 

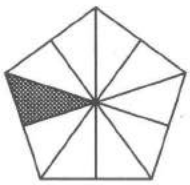
11. 

12. 

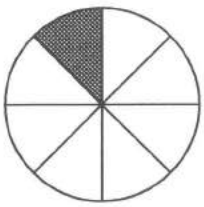
Complete shading each figure so that each design has the given order of rotational symmetry.

13. 

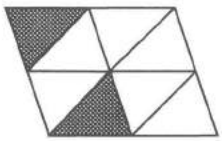
order 2

14. 

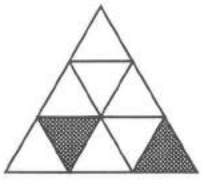
order 5

15. 

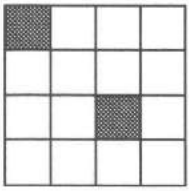
order 4

16. 

order 2

17. 

order 3

18. 

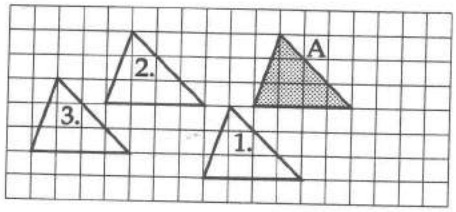
order 4

Name _____

Test One CHAPTER 12: Transformations

MATHPOWER™ *Seven*, pp. 405–433

Describe a translation that matches A with the other figures.

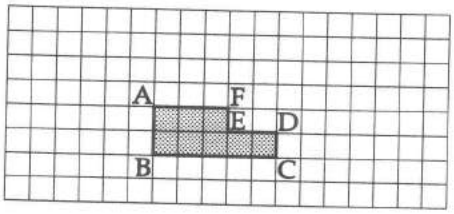


1. _____ 2. _____

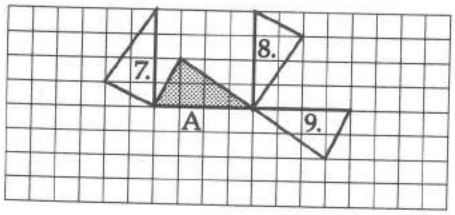
3. _____

Draw the image of the figure for each of the following translations.

4. 2 units left, 3 units up
5. 5 units right
6. 4 units right, 2 units down



Describe a clockwise rotation that matches the figure A with the other figures.

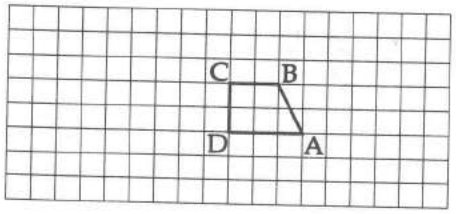


7. _____ 8. _____

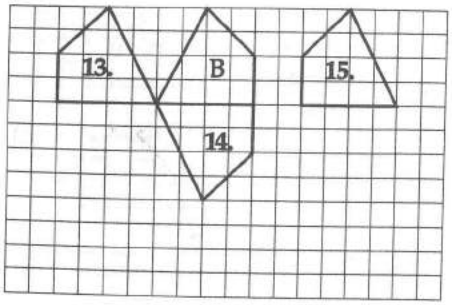
9. _____

Draw an image of the figure for each rotation.

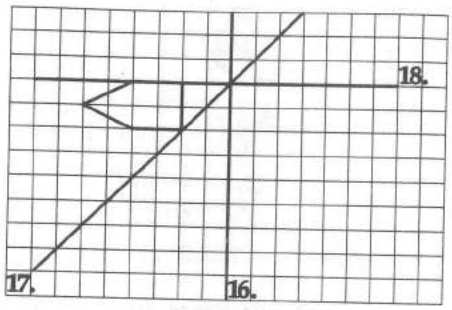
10. 180° counterclockwise about C
11. 90° clockwise about D
12. 90° counterclockwise about A



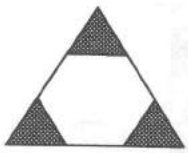
Draw the reflection line between B and each of the other figures.

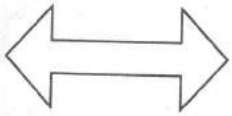


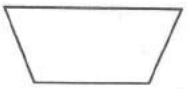
Draw the reflection image of the figure in each reflection line.



Draw all lines of symmetry for each figure.

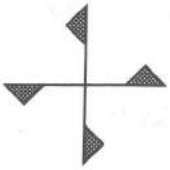
19. 

20. 

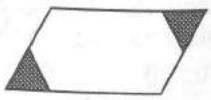
21. 

22. 

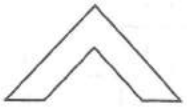
State the order of rotational symmetry for each of the following.

23. 

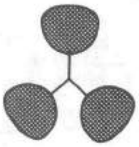
_____

24. 

_____

25. 

_____

26. 

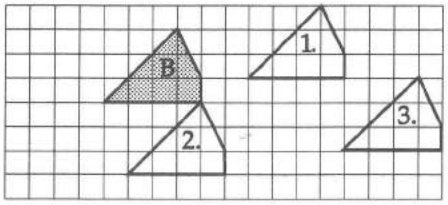
_____

Name _____

Test Two CHAPTER 12: Transformations

MATHPOWER™ *Seven*, pp. 405–433

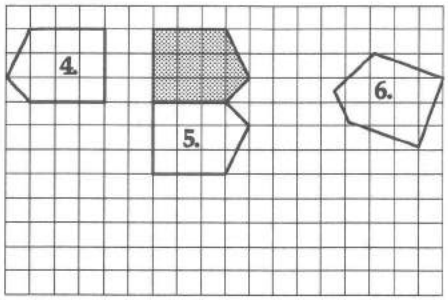
Describe the translation that matches B with each of the other figures.



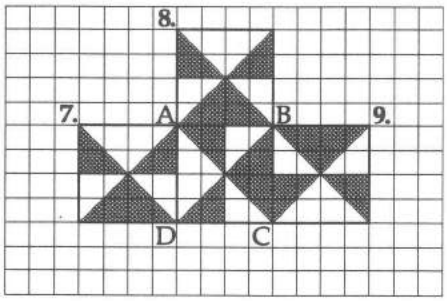
1. _____ 2. _____

3. _____

Draw the reflection line for each image.



Describe the counterclockwise rotation and the turn centre that produces each image. The original figure is ABCD.

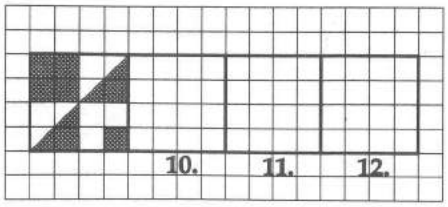


7. _____ 8. _____

9. _____

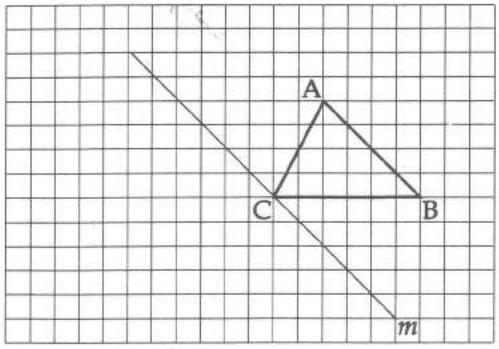
Complete the strip pattern by drawing the image following each motion.

10. 90° turn clockwise
11. 270° turn counterclockwise
12. 90° turn clockwise

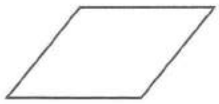


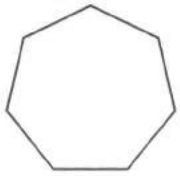
Draw the image of ΔABC after each of the following transformations. Begin with ΔABC for each transformation.

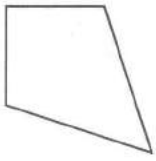
13. a translation of 4 units left, 3 units down
14. a reflection in line m
15. a rotation of 270° clockwise about C

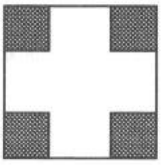


Draw all lines of symmetry for each figure.

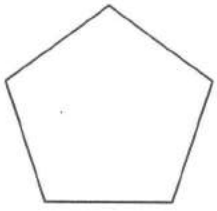
16. 

17. 

18. 

19. 

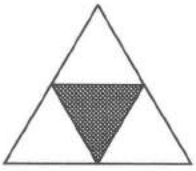
State the order of rotational symmetry for each figure.

20. 

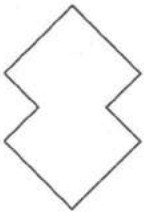
_____

21. 

_____

22. 

_____

23. 

_____

Name _____

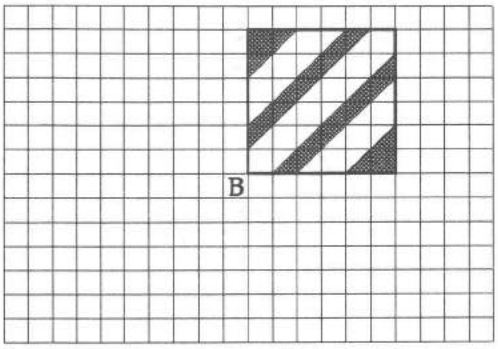
Extension CHAPTER 12: Transformations

MATHPOWER™ *Seven*, pp. 405–433

1. Draw each of the following rotation images for the figure with rotation centre B.

i) 90° counterclockwise **ii)** 90° clockwise

iii) 180° counterclockwise



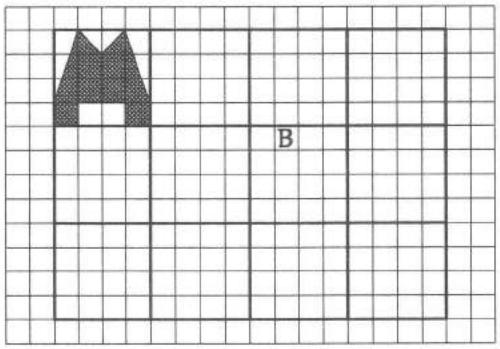
a) How many lines of symmetry does the completed figure have?

_____

b) What is the order of rotational symmetry of the completed figure?

_____

2. Create a design by reflecting the image horizontally and vertically.

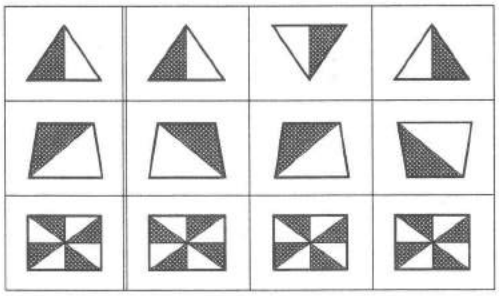


3. Circle the images on the right that are translations of the figure on the left.

a)

b)

c)



4. Print the alphabet in block letters.

a) Which letters have 1 line of symmetry?

_____

b) Which letters have 2 lines of symmetry?

_____

c) Which letters have no lines of symmetry?

_____

d) Which letters have rotational symmetry of order 2?

_____

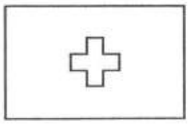
5. Research the flags of Canada's provinces and territories.

a) Sketch and name any flag(s) with a horizontal line of symmetry.

b) Sketch and name any flag(s) with a vertical line of symmetry.

c) Sketch and name any flag that has no lines of symmetry.

6. The figure shows the flag of Switzerland.



a) What is the order of rotational symmetry of this flag?

_____

b) How many lines of symmetry does it have?

_____

c) Add designs to the flag so that it has vertical symmetry, but no horizontal symmetry.

d) What is the order of symmetry of this new flag?

_____

7. Design a flag for yourself that satisfies each of these conditions.

a) 4 lines of symmetry

b) rotational symmetry of order 4

Name _____

13.1 Constructing Congruent Line Segments and Angles

MATHPOWER™ *Seven*, pp. 438–439

Use the method of your choice to construct line segments with the following lengths.

1. 3.8 cm

2. 6.2 cm

3. 57 mm

Use the method of your choice to construct line segments congruent to each of the following.

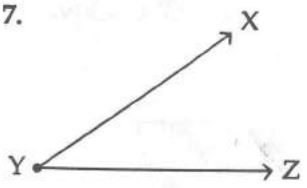
4.

5.

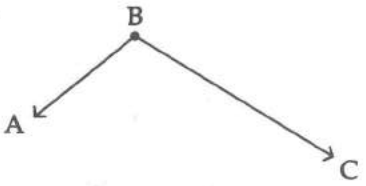
6.

Use ruler and compasses to construct an angle congruent to each of the following.

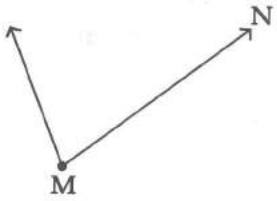
7.



8.



9.



Use a protractor to draw angles with the following measures. Construct an angle congruent to each angle using ruler and compasses.

10. 60°

11. 110°

Name _____

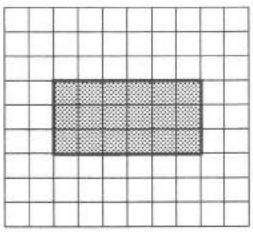
13.2 Constructing Bisectors

MATHPOWER™ *Seven*, pp. 440-441

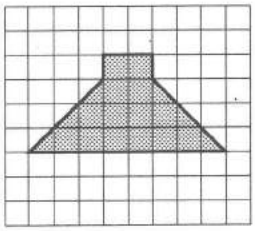
A **bisector** divides a figure into 2 congruent parts.

Draw a line to bisect each of the following.

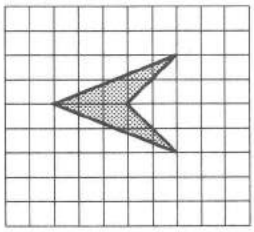
1.



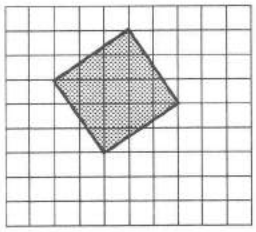
2.



3.

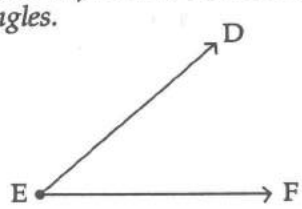


4.

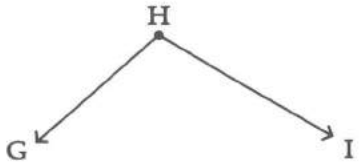


Use ruler and compasses to bisect each of the following angles.

5.



6.



Use ruler and compasses to bisect each line segment.

7.

8.

Draw an angle with each of the following measures. Use the method of your choice to construct the bisector of each angle.

9. 67°

10. 125°

11. 43°

Draw a line segment with each of the following lengths. Use the method of your choice to construct the right bisector of each line segment.

12. 5 cm

13. 3 cm

14. 4.4 cm

Name _____

13.3 Constructing Perpendiculars

MATHPOWER™ *Seven*, pp. 442–443

Perpendicular lines meet at right angles.

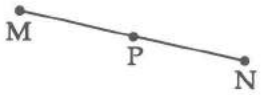
A perpendicular line can be constructed from a point on the line or from a point not on the line.

The perpendicular line from a vertex of a triangle to the side opposite that vertex is called an **altitude**.

Construct a perpendicular at P using the method of your choice.

1.

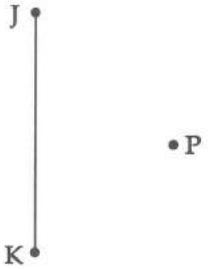
2.



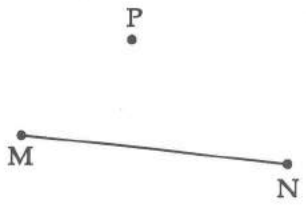
3.

Construct the perpendicular from P to each of the given lines using the method of your choice.

4.



5.

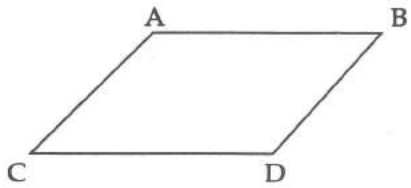


6.

7. For parallelogram ABCD,

a) construct AE perpendicular to CD.

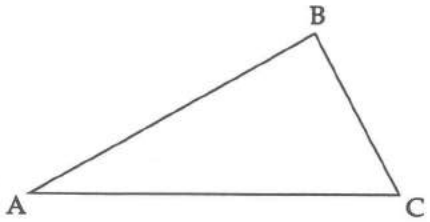
b) construct DF perpendicular to AB.



c) Name the figure you constructed.

_____

8. Construct the 3 altitudes for ΔABC.



Name _____

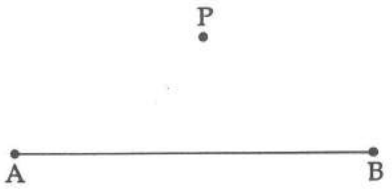
13.4 Constructing Parallel Lines

MATHPOWER™ *Seven*, pp. 444–445

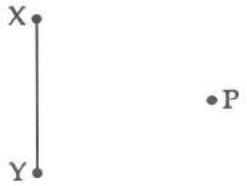
Lines that are in the same plane and do not meet are called **parallel lines.**

Use a method of your choice to construct a line segment through P parallel to each line segment.

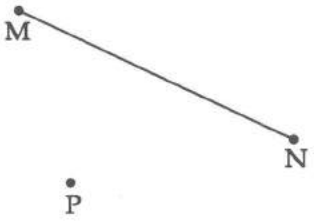
1.



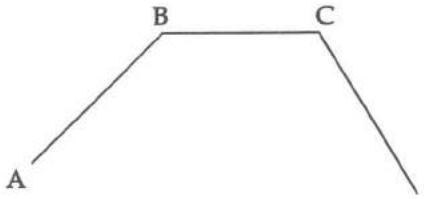
2.



3.

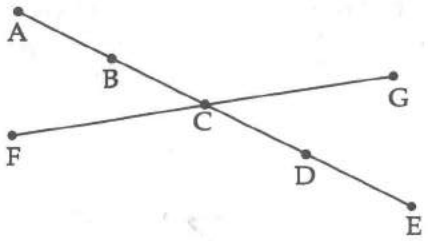


4. Complete the trapezoid by constructing a line through A parallel to BC.



5. Construct a rectangle with one pair of sides 2 cm and the other pair of sides 4 cm.

6.



a) Construct a line segment PQ through B parallel to FG.

b) Construct a line segment XY through D parallel to FG.

c) Name 5 angles equal to ∠DCG.

_____

_____

d) Name 5 angles equal to ∠DCF.

_____

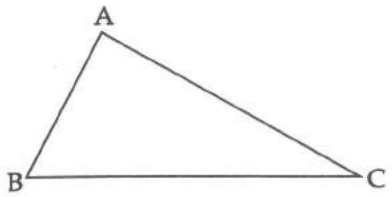
_____

7. Construct a line through each vertex of ΔABC parallel to the opposite side. Label the points where the new lines intersect. Name each of the following in the new figure.

a) all the triangles _____

b) all the parallelograms _____

c) all the trapezoids _____



Name _____

13.5 Constructing Polygons

MATHPOWER™ *Seven*, pp. 448–449

Polygons can be drawn using different construction methods such as tracing paper, ruler and protractor, or compasses.

1. Construct square ABCD, where each side is 4 cm.

2. Construct ΔABC, where AB = 3 cm, AC = 3.5 cm, and BC = 2 cm.

3. Construct ΔXYZ, where $\angle X = 90°$, XY = 5 cm, and XZ = 2.5 cm.

4. Construct equilateral triangle PQR, where each side is 3.5 cm.

5. Construct a rectangle ABCD, where AB = 4.5 cm, BC = 3 cm, DC = 4.5 cm, and AD = 3 cm.

6. Construct a parallelogram KLMN, where KL = 5.5 cm, LM = 2.5 cm, NM = 5.5 cm, KN = 2.5 cm, and $\angle K = 60°$.

Name _____

Test One CHAPTER 13: Geometric Constructions

MATHPOWER™ *Seven*, pp. 435–455

1. Draw line segments with the following lengths.

a) 64 mm

b) 4.8 cm

c) 2.6 cm

2. Use ruler and compasses to bisect each line segment in question 1.

3. Construct angles with the following measures.

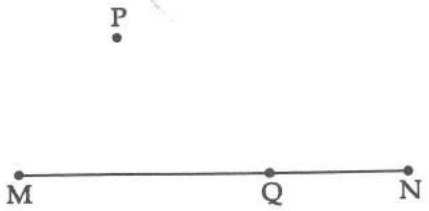
a) 72°

b) 34°

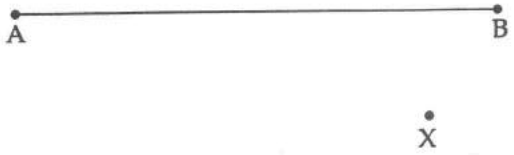
c) 130°

4. Construct the bisector of each angle in question 3.

5. Use ruler and compasses to construct the perpendiculars from P and Q to MN.



6. Construct a line through X parallel to AB.



7. Construct ΔPQR, where PQ = 4 cm, PR = 3.5 cm, and QR = 2.5 cm.

8. Construct isosceles ΔABC, where BC = 3 cm and the other 2 sides are each 4.5 cm.

Name _____

Test Two CHAPTER 13: Geometric Constructions

MATHPOWER™ *Seven*, pp. 435–455

1. Draw line segments with the following lengths.

a) 3.6 cm

b) 49 mm

2. Use ruler and compasses to bisect each line segment in question 1.

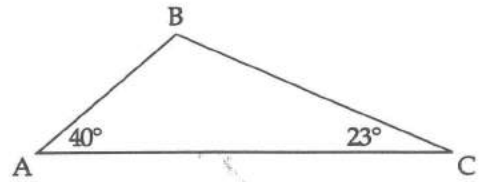
3. Construct angles with the following measures.

a) 76°

b) 148°

4. Construct the bisector of each angle in question 3.

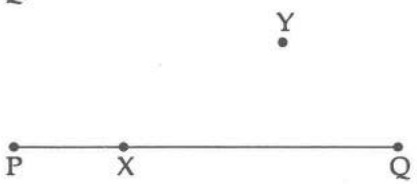
5. a) In the diagram, construct XY through B parallel to AC.



b) Determine the measure of each of the following angles.

∠ABC _____ ∠XBA _____ ∠YBC _____

6. Construct perpendiculars at X and from Y to PQ.



7. Construct square ABCD, where each side is 3.5 cm.

8. a) Construct ΔDEF, where DE = 4.5 cm, DF = 4.5 cm, and EF = 7.5 cm.

b) Measure each angle in the triangle.

∠DEF _____ ∠EFD _____ ∠FDE _____

Name _____

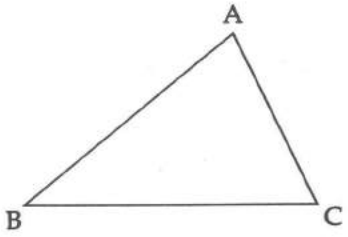
Extension CHAPTER 13: Geometric Constructions

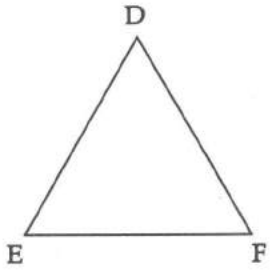
MATHPOWER™ *Seven*, pp. 435–455

1. The diagrams show 2 triangles, scalene ΔABC and isosceles ΔDEF.

a) In ΔABC, construct the perpendicular bisector of BC and the bisector of $\angle A$.

b) In ΔDEF, construct the perpendicular bisector of EF and the bisector of $\angle D$.





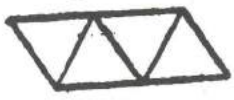
c) Compare your results for the 2 triangles.

_____

_____

2. a) Construct 4 equilateral triangles, as shown, to make the net of a tetrahedron. Make each side of each triangle 3 cm in length.

Rough sketch



b) Trace the net, cut out the tracing, and make a tetrahedron.

3. A kite is a quadrilateral with 2 pairs of equal sides, as shown in the diagram.

a) Draw 2 different kites, each with two 2-cm sides and two 3-cm sides.

b) What is different about the 2 kites?

4. a) Construct rhombus ABCD with each side equal to 4 cm and $\angle A = 60°$.

b) Identify the pairs of congruent angles.

_____

c) Identify the pairs of supplementary angles.

_____

Answers

CHAPTER 1: Number Connections

1.1 Choosing a Calculation Method

1. approximate **2.** approximate **3.** exact
4. approximate **5.** exact **6.** exact **7.** exact
8. approximate **9–14.** Answers may vary.
9. paper and pencil **10.** calculator
11. calculator **12.** computer **13.** calculator
14. paper and pencil **15.** mental math; 5
16. calculator; 1400 **17.** calculator; 9.24
18. calculator; 10 701 **19.** mental math; 34 000
20. mental math; 12 **21. a)** Answers may vary. **Approximate:** Approximately, what are the average sales for the 3 busiest days of the week? **Exact:** What were the total sales for the week at Mary Ann's Cycle Shop? **b) Approximate:** Approximately, the average sales for the 3 busiest days are $3400.00. **Exact:** The total sales for the week at Mary Ann's Cycle Shop were $12 774.77.

1.2 Place Value

1. 20 **2.** 9 000 000 **3.** 0.0004 **4.** 8302
5. 2 033 504 **6.** 6.5 **7.** 1 013.849
8. two thousand eight hundred ninety-four
9. six hundred eighty-seven and ninety-five hundredths **10.** three hundred fifty-seven thousandths **11.** one thousand nine hundred seventy-six and eighty-nine thousandths
12. 13 008 **13.** 4 069 604 **14.** 35.42
15. 342.187 **16.** $(2 \times 100) + (3 \times 1)$ **17.** $(3 \times 10) + (4 \times 1) + (1 \times 0.1) + (2 \times 0.01) + (7 \times 0.001)$
18. $(2 \times 100) + (7 \times 10) + (6 \times 1) + (1 \times 0.1) + (3 \times 0.01)$ **19.** $(3 \times 10\,000\,000) + (4 \times 1\,000\,000) + (1 \times 100\,000) + (2 \times 10\,000) + (3 \times 1000) + (6 \times 1)$
20. > **21.** < **22.** > **23.** = **24.** 1980, 835.65; 1984, 710.91; 1992, 677.31; 1988, 638.61; 1976, 600.51; 1972, 504.12

1.3 Rounding Numbers: Mental Math

1. 573 870 **2.** 573 900 **3.** 574 000 **4.** 570 000
5. 600 000 **6.** 34.2 **7.** 34.18 **8.** 34.183 **9.** 34

	Number	Nearest One	Nearest Tenth	Nearest Hundredth
10.	35.958	36	36.0	35.96
11.	146.372	146	146.4	146.37
12.	93.525	94	93.5	93.53
13.	555.321	555	555.3	555.32
14.	46.396	46	46.4	46.40
15.	826.119	826	826.1	826.12

16. 6100 **17.** 50 000 **18.** 321.640 **19.** 721.2
20. 45 **21.** 730 **22.** tenth **23.** hundred
24. one **25.** hundredth **26.** ten **27.** thousandth

	River	Length (km)	Nearest Hundred	Nearest Thousand
28.	Mackenzie	4241	4200	4000
29.	St. Lawrence	3058	3100	3000
30.	Yukon	3185	3200	3000
31.	Peace	1923	1900	2000
32.	Athabasca	1231	1200	1000
33.	Ottawa	1271	1300	1000

34. 5, 6, 7, 8, or 9 **35.** 0, 1, 2, 3, or 4 **36.** 0, 1, 2, 3, or 4 **37.** 5, 6, 7, 8, or 9 **38.** 0, 1, 2, 3, or 4
39. 5, 6, 7, 8, or 9

1.4 Problem Solving: Look for a Pattern

1. 17, 21, 25, 29; add 4 to the preceding number.
2. 32, 64, 128, 256; multiply the preceding number by 2.
3. 65, 60, 54, 47; subtract the preceding difference increased by 1.
4. 111 111; 1 111 111 **5.** 98 765; 987 654
6. Add 9 to the first number.

4	13
6	15
10	19
13	22
16	25
21	30

7. Divide the first number by 2.

24	12
20	10
16	8
12	6
8	4
4	2

8. Multiply the first number by 3 and add 1.

2	7
6	19
4	13
3	10
7	22
5	16

9. Multiply the first number by 3 and subtract 3.

2	3
5	12
4	9
8	21
3	6
6	15
7	18

10. 11 squares **11.** 17 squares **12.** 23 squares
13. Multiply the first number by 10 and subtract 5.

1.5 Estimating Sums and Differences: Mental Math

Estimates may vary. **1.** 800 **2.** 700 **3.** 20
4. 170 **5.** 130 **6.** 26 **7.** 12 000 **8.** 160
9. 20 000 **10.** 300 **11.** 2 **12.** 60 **13.** 2100
14. 400 **15.** 4900 **16.** $60 **17.** $380
18. $130 **19.** $120 **20.** $3 **21.** 4300 kg
22. $26 **23.** 1200 km **24.** 30 km

1.6 Adding and Subtracting Numbers

1–6. Estimates may vary.
1. 585; 590 **2.** 2138; 2200 **3.** 97 069; 97 000
4. 523.903; 524 **5.** 1549.12; 1600 **6.** 17 796.33; 17 700

	+	21.95	20.963	184.7	53.08
7.	299	320.95	319.963	483.7	352.08
8.	16.54	38.49	37.503	201.24	69.62
9.	178.09	200.04	199.053	362.79	231.17
10.	95.87	117.82	116.833	280.57	148.95

	−	106	72.51	250.4	412.35
11.	47	59	25.51	203.4	365.35
12.	2.96	103.04	69.55	247.44	409.39
13.	68.08	37.92	4.43	182.32	344.27
14.	38.98	67.02	33.53	211.42	373.37

15. 1837 **16.** 40.47 **17.** 51 420 **18.** 266.47
19. 858.77 **20.** 143.908 **21.** 33 608 **22.** 533
23. 33.084 **24.** 223.391 **25.** 207 277 people
26. $5.27 **27.** 383.13 m

1.7 Problem Solving: Guess and Check

1. 36 **2.** 100 **3.** 20 nickels, 25 quarters
4. Danielle - $20.00; Jared - $12.00 **5.** 31 × 57 = 1767 **6.** 53 × 79 = 4187 **7.** 53 **8.** 28 **9.** 987 + 654 = 1641 **10.** 468 × 579 = 270 972
11. 9 family, 6 individual; $900.00 + $270.00
12. 15 family, 7 individual; $1500.00 + $315.00

1.8 Multiplying by Powers of Ten: Mental Math

1.9 Using Powers of Ten: Mental Math

	Number	× 10	× 100	× 1000
1.	78	780	7800	78 000
2.	6.2	62	620	6200
3.	11.7	117	1170	11 700
4.	4.21	42.1	421	4210
5.	75.98	759.8	7598	75 980

	Number	× 0.1	× 0.01	× 0.001
6.	23	2.3	0.23	0.023
7.	4.8	0.48	0.048	0.0048
8.	79.6	7.96	0.796	0.0796
9.	2.37	0.237	0.0237	0.002 37
10.	31.01	3.101	0.3101	0.031 01

	Number	× 20	× 200	× 2000
11.	2	40	400	4000
12.	7	140	1400	14 000
13.	12	240	2400	24 000
14.	0.4	8	80	800
15.	30	600	6000	60 000

	Number	× 0.4	× 0.04	× 0.004
16.	6	2.4	0.24	0.024
17.	4	1.6	0.16	0.016
18.	11	4.4	0.44	0.044
19.	25	10	1	0.1
20.	50	20	2	0.2

21. 1.24 **22.** 1.3742 **23.** 635 **24.** 0.726
25. 0.322 **26.** 1560 **27.** 0.8302 **28.** 7020
29. 0.13 **30.** 0.0379 **31.** 18 **32.** 0.28
33. 1200 **34.** 32 000 **35.** 4000 **36.** 120 000
37. 0.21 **38.** 24 **39.** 2154.475 **40.** 532.432

1.10 Estimating Products: Mental Math

Estimates may vary.

1.	40	**2.**	400	**3.**	800	**4.**	40
	× 6		× 30		× 7		× 4
	240		12 000		5600		160

5. 2100 **6.** 1000 **7.** 1800 **8.** 2800 **9.** 8000
10. 0.5 **11.** 16 **12.** 600 **13.** 21 **14.** 4.5 **15.** 173
16. 73 **17.** 600 **18.** 16 **19.** 400 **20.** 63 000
21. 1 200 000 **22.** 3000 **23.** 3 360 000
24. 13 600 **25.** 4300 **26.** 10 000 **27.** 1140
28. 60 000 **29.** 48 **30.** $150.00 **31.** $1750.00
32. $2100.00 **33.** $2000.00 **34.** $1200.00
35. $144.00 **36.** 200 km

1.11 Multiplying Numbers

1.	23	**2.**	84	**3.**	1.2	**4.**	8.7
	× 8		× 7		× 0.4		× 6
	184		588		0.48		52.2
5.	27	**6.**	56	**7.**	439	**8.**	3.02
	× 0.7		× 0.9		× 7		× 9
	18.9		50.4		3073		27.18
9.	4.15	**10.**	48	**11.**	29	**12.**	3.4
	× 0.3		× 23		× 72		× 53
	1.245		1104		2088		180.2
13.	7.5	**14.**	0.23	**15.**	6.2	**16.**	4.7
	× 61		× 1.5		× 3.7		× 2.6
	457.5		0.345		22.94		12.22

17.	34	**18.**	86
	× 0.47		× 8.7
	15.98		748.2

19. 13 416 **20.** 1167.6 **21.** 416.58 **22.** 1521.6
23. 420 **24.** 4.42 **25.** 836 830 **26.** 3 691 994
27. 50 471.4 **28.** 1732.68 **29.** 296.786
30. 1632.176

31.
$$\begin{array}{r} 289 \\ \times\ 36 \\ \hline 1734 \\ 867 \\ \hline 10404 \end{array}$$

32.
$$\begin{array}{r} 56 \\ \times\ 43 \\ \hline 168 \\ 224 \\ \hline 2408 \end{array}$$

33. $133.00 **34.** 14.16 m **35.** 8794.1 m

1.12 Dividing by Powers of Ten: Mental Math

	Number	÷ 10	÷ 100	÷ 1000
1.	346	34.6	3.46	0.346
2.	62.9	6.29	0.629	0.0629
3.	9003	900.3	90.03	9.003
4.	4.76	0.476	0.0476	0.004 76
5.	700	70	7	0.7

	Number	÷ 0.1	÷ 0.01	÷ 0.001
6.	34	340	3400	34 000
7.	8.3	83	830	8300
8.	68.2	682	6820	68 200
9.	2.75	27.5	275	2750
10.	49.01	490.1	4901	49 010

11. 32.1 **12.** 0.534 **13.** 2.4378 **14.** 0.439
15. 0.009 33 **16.** 0.0147 **17.** 6.491 **18.** 0.0809
19. 0.63 **20.** 0.0848 **21.** 2 **22.** 50 000
23. 70 000 **24.** 2000 **25.** 30 **26.** 40 000
27. 0.08 **28.** 90 000 **29.** 7346.71 **30.** 58.5
31. 737.8 **32.** $1.38/ball **33.** 0.6 min

1.13 Estimating Quotients: Mental Math

Estimates may vary.

1. $\frac{36}{6} = 6$ **2.** $\frac{24}{3} = 8$
3. $\frac{160}{8} = 20$ **4.** $\frac{36}{6} = 6$
5. $\frac{250}{5} = 50$ **6.** $\frac{170}{10} = 17$
7. $\frac{332}{4} = 83$ **8.** $\frac{108}{9} = 12$
9. $\frac{490}{7} = 70$ **10.** $\frac{588}{2} = 294$

11. 5 **12.** 6 **13.** 9 **14.** 7 **15.** 50 **16.** 55
17. $0.70/bottle **18.** 25 tags **19.** $2.50/car
20. $10/kg **21.** $0.60/kg **22.** $1.35/kg
23. $0.90/kg

1.14 Short Division
1.15 Dividing Numbers

1. 10 **2.** 50 **3.** 20 **4.** 40 **5.** 80 R4 **6.** 81 R5
7. 522 R2 **8.** 897 R5 **9.** 1236 R1 **10.** 458 R1
11–18. Estimates may vary.
11. 0.08 **12.** 0.55 **13.** 2.28 **14.** 0.014
15. 12.97 **16.** 2.26 **17.** 1.259 **18.** 93.9
19. $\frac{6}{20} = 0.3$ **20.** $\frac{72}{30}$ or $\frac{7.2}{3} = 2.4$
21. $5\overline{)1550}$; 310 **22.** $4\overline{)284}$; 71
23–28. Estimates may vary. **23.** 20; 23.6
24. 40; 42.1 **25.** 3; 3.2 **26.** 0.4; 0.4 **27.** 4; 4.8
28. 6000; 6150.0 **29.** 15.9 **30.** 1.3 **31.** 6.7
32. 1.3 **33.** 681.1 **34.** 2039.2

1.16 Problem Solving: Make an Assumption

1. 80, 70, 58 **2.** 39, 45, 51 **3.** 14, 17, 21
4–14. Answers may vary. **4.** They will pay $1186.08 for hydro in a year. The cost of hydro per month does not change over the year.
5. Connor could ride 90 km in 2 h. He maintains the same speed over the entire 2 h, without rests or pauses.
6. The student council assumed that most people at the dance would prefer to drink cola. They also assumed that the people who did not prefer cola would be as likely to drink ginger ale as they would be to drink orange soda.
7. Mr. Blake will spend $342.16 on milk in a year. The cost of milk will not change over the year.
8. Jenny assumed that all the cans were the same size and the shelves were high enough to hold 2 layers of cans.
9. 3 **10.** 13 **11.** 36 **12.** 32 **13.** Answers may vary. **a)** For question 9, the assumption is that the numbers will decrease by a constant value of 3. For 10, the numbers will increase by a constant value of 5. For 11, the numbers are successive multiples of 12. For 12, the numbers increase by a constant value of 4 times the previous number. **b)** 2, 15, 37, 13. For question 9, the assumption is that the difference increases by 1 over the preceding difference. For 10, the difference increases by 2 over the preceding difference. For 11, the difference increases by 1 over the preceding difference. For 12, the difference decreases by 1 over the preceding difference. **14. a)** The councillor might assume that the entire neighbourhood favoured the plan. **b)** No, the survey is not accurate. The population in a neighbourhood is very small. Every household in the neighbourhood should have been surveyed for accurate results.

1.17 Order of Operations

1. 7 **2.** 8 **3.** 22 **4.** 10 **5.** 10.6 **6.** 12 **7.** 2
8. 7 **9.** 6 **10.** 21 **11.** 7.5 **12.** 4 **13.** 8 **14.** 4.8
15. 22.8 **16.** 28 **17.** 3 **18.** 12.2 **19.** 35 **20.** 8
21. < **22.** > **23.** = **24.** > **25.** $3 \times 8 \div (2 \times 2) = 6$
26. $11.3 + 12 \div (2 \times 6) = 12.3$

27. $(19 - 7) \times 3 + 2 = 18$
28. $6 \times 7 + (11.4 - 10.4) = 42$
29. $3 \times (9 + 6) + 5 = 9$ **30.** 8.66 **31.** 10
32. The correct number sentence is in d):

$$28 - (5 \times 5) = n$$
$$28 - 25 = n$$
$$n = 3$$

Test One Chapter 1: Number Connections

1. 70 000 **2.** 7 000 000 **3.** 2 **4.** 0.0001
5. 53 900 **6.** 438.781 **7.** 12.3117 **8.** 2064.035
9. 172.97 **10.** $1 \times 1\,000\,000 + 2 \times 100\,000 + 8 \times 10\,000 + 6 \times 1000 + 3 \times 100 + 9 \times 1$
11. $4 \times 10 + 7 \times 1 + 2 \times 0.1 + 4 \times 0.01 + 8 \times 0.001 + 1 \times 0.0001$ **12.** three hundred twenty-eight and one hundred forty-nine thousandths
13. sixty-one and thirty-seven hundredths
14. 325 400 **15.** 5 600 000 **16.** 32 **17.** 26.9
18. 17.78 **19.** 1.466 **20.** 1866 **21.** 14 894.59
22. 13 036 **23.** 2754.73 **24.** 229 824 **25.** 35.856
26. 398.25 **27.** 0.76 **28.** 64.3 **29.** 45.26
30. 0.0362 **31.** 2.86 **32.** 130 **33.** 7380 **34.** 19
35. 43.1 **36.** On 13 issues at the subscription price, $8.80 can be saved over the newsstand price.

Test Two Chapter 1: Number Connections

1. 8000 **2.** 0.004 **3.** 1 000 000 **4.** 0.8
5. a) 348 922 **b)** 104.87 **c)** 32 471.47
d) 352.75 **e)** 300 000.164 Ordered from smallest to largest: 104.87, 352.75, 32 471.47, 300 000.164, 348 922 **6.** 673 807 **7.** 673 807.4
8. 673 810 **9.** 673 807.39 **10.** 670 000
11. 673 80012. seven hundred forty-three thousandths **13.** three hundred seventy-two and fourteen hundredths **14.** thirty-five and seven hundred forty-six thousandths **15.** seven hundred two and eight thousandths
16. 5264 **17.** 2326.15 **18.** 3878.08 **19.** 9611
20. 14.4054 **21.** 18 171 **22.** 840.5 **23.** 1.32
24. 137.8 **25.** 0.49 **26.** 7.9263 **27.** 510.3
28. 58 513.1 **29.** 20 **30.** 836.7 cm of string

Extension Chapter 1: Number Connections

1. a) 473.18 **b)** 3431.965 **c)** 7282.37 **d)** 583 **e)** 863.5 Sum: 12 634.015
2. a) 467 325 **b)** 238 218 Difference: 229 107
3. a) 9348.71 **b)** 4839.57 Difference: 4509.14
4. a) 562.84 **b)** 83.06 Product: 46 749.49
5. 38 **6.** 71.375 **7.** 63.24 **8.** 2490 **9.** 0.3384
10. 0.585 **11.** 0.0344 **12.** 5.296 **13.** 43.14
14. 44.74 **15.** 2451.8 **16.** 68.872
17–18. Answers may vary. **19.** 7.49 **20.** 2.5

CHAPTER 2: Number Theory

2.1 Factors and Divisibility

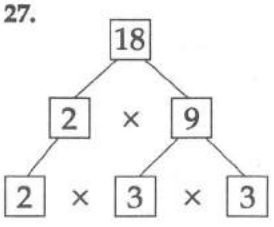
1. $5 \times 9 = 45$ **2.** $7 \times 3 = 21$ **3.** $11 \times 7 = 77$
4. $9 \times 6 = 54$ **5.** $7 \times 7 = 49$ **6.** $2 \times 8 = 16$
7. $7 \times 4 = 28$ **8.** $9 \times 4 = 36$
9-13. Answers may vary.
9. $6 \times 4 = 24$; $8 \times 3 = 24$ **10.** $13 \times 2 = 26$; $26 \times 1 = 26$ **11.** $6 \times 8 = 48$; $12 \times 4 = 48$
12. $16 \times 5 = 80$; $40 \times 2 = 80$ **13.** $27 \times 4 = 108$; $54 \times 2 = 108$ **14.** 1, 2, 4, 8, 16, 32 **15.** 1, 5, 13, 65
16. 1, 2, 4, 5, 8, 10, 16, 20, 40, 80
17. 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72
18. 1, 2, 4, 13, 26, 52 **19.** 1, 2, 3, 4, 6, 9, 12, 18, 36
20. 1, 3, 19, 57 **21.** 1, 3, 7, 9, 21, 63
22. 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96
23. a) 36, 52, 96 **b)** 36, 57, 63, 96 **c)** 36, 96
24–30. Some answers may vary.
24. $2 \times 3 \times 30 = 180$ **25.** $2 \times 3 \times 50 = 300$
26. $3 \times 4 \times 20 = 240$ **27.** $8 \times 6 \times 4 = 192$
28. $14 \times 6 \times 2 = 168$ **29.** $5 \times 9 \times 5 = 225$
30. $2 \times 2 \times 53 = 212$ **31.** 60 **32.** 36 **33.** 44
34. 30 **35.** 9 **36.** 8 **37.** 8, 9 **38.** 8 ways

2.2 Problem Solving: Work Backward

1. 50 **2.** 15 **3.** 4 people **4.** 1928 **5.** $20.00
6. $120.00 **7.** 15:05

2.3 Prime and Composite Numbers
2.4 Prime Factors

1. 1, 2, 3, 6 **2.** 1, 3 **3.** 1, 2, 7, 14 **4.** 1, 13
5. 1, 29 **6.** 1, 3, 7, 21 **7.** 1, 37 **8.** 1, 61
9. 1, 3, 17, 51 **10.** 1, 73 **11.** 1, 3, 5, 9, 15, 45
12. 1, 3, 7, 9, 21, 63 **13.** 6, 14, 21, 51, 45, 63
14. 1, (2), (3), 4, 6, 9, 12, 18, 36
15. 1, (2), (3), 4, 6, 12
16. 1, (2), (3), 4, (5), 6, 10, 12, 15, 20, 30, 60
17. 1, (2), (3), 4, 6, 8, 12, 16, 24, 48
18. 1, (5), (17), (85)
19. 7×5 **20.** 19×3 **21.** 67×2 **22.** 19×5
23. 17×2 **24.** 23×7 **25.** 11×5 **26.** 23×5
27.



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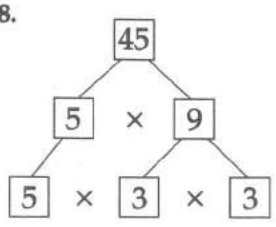

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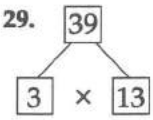

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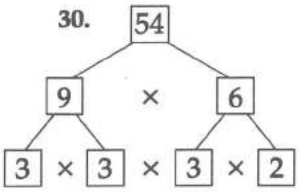

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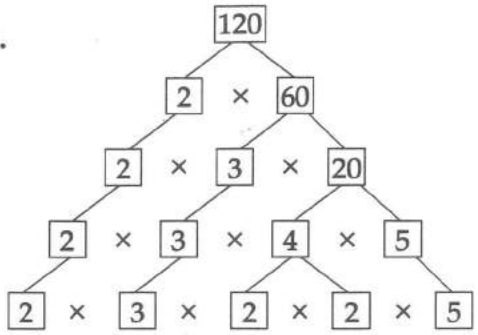
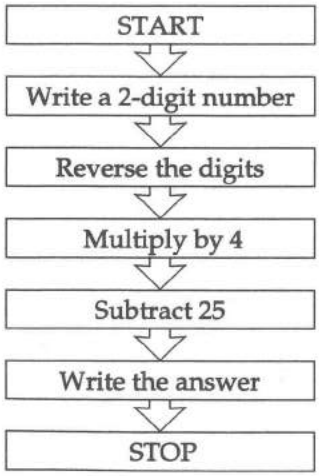


32. 3, 7 **33–34.** Answers may vary.
33. 6, 14, 21 **34.** 35, 65, 91
35. 19, 29; 17, 31; 11, 37; 7, 41; 43, 5

2.5 Problem Solving: Draw a Diagram or Flow Chart

1. The steps in order are as follows: (1) Open the workbook and measure its length and width. (2) Add 3 cm to each dimension. (3) Cut a rectangle out of wallpaper to match the calculated dimensions. (4) Centre the workbook on the rectangle. (5) Fold in the sides on the workbook covers. (6) Cut a slit above and below the spine of the workbook. (7) Fold in the top and the bottom on each book cover. (8) Fold a triangle in at each corner of both covers. (9) Close the workbook and write your name on the front of it.
2. 23 posts **3.** 40 counters
4.



5. 263 **6.** 315 **7.** 191 **8.** 131 **9.** 24 nails
10. 12 sections

2.6 Greatest Common Factor
2.7 Lowest Common Multiple

1. a) 1, 2, 4, 5, 10, 20; 1, 2, 3, 4, 6, 8, 12, 16, 24, 48; 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 **GCF:** 4
b) 1, 2, 4, 8, 16, 32; 1, 2, 4, 5, 8, 10, 20, 40; 1, 2, 4, 7, 8, 14, 28, 56 **GCF:** 8
2. 1, 2, 4, (8) **3.** 1, 2, 3, 4, 6, (12) **4.** 1, (11) **5.** 13
6. 2 **7.** 8 **8. a)** 2, 4, 6, 8, 10, 12, 14, 16, 18, 20; 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 **LCM:** 6 **b)** 8, 16, 24, 32, 40, 48, 56, 64, 72, 80; 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 **LCM:** 24 **c)** 4, 8, 12, 16, 20, 24, 28, 32, 36, 40; 10, 20, 30, 40; 50, 60, 70, 80, 90, 100 **LCM:** 20 **9.** 42 **10.** 21 **11.** 15
12. 66 **13.** 35 **14.** 85 **15.** 39 **16.** 69 **17.** 20
18. 40 **19.** 168 **20.** 60 **21.** 15th beat

2.8 Exponents

1. 8 **2.** 3 **3.** 4^3 **4.** 4 **5.** 7 **6.** $10 \times 10 = 100$
7. $4 \times 4 \times 4 = 64$ **8.** $2 \times 2 \times 2 \times 2 = 16$
9. $7 \times 7 = 49$ **10.** $3 \times 3 \times 3 \times 3 \times 3 = 243$
11. $6 \times 6 = 36$ **12.** $3 \times 3 \times 3 = 27$
13. $5 \times 5 \times 5 \times 5 = 625$ **14.** 3^5 **15.** 8^3 **16.** 7^5
17. 2^7 **18.** 5^4 **19.** 10^4 **20.** 10^2 **21.** 10^7 **22.** 10^5
23. 125 **24.** 16 **25.** 81 **26.** 512 **27.** 216
28. 343 **29.** 9 **30.** 100 **31.** 256 **32.** 8 **33.** 32
34. 1 **35.** 100 000 **36.** 1024 **37.** 144 **38.** 25
39. 64

	Power	Base	Exponent	Standard Form
40.	10^3	10	3	1000
41.	5^5	5	5	3125
42.	4^3	4	3	64
43.	7^4	7	4	2401
44.	6^3	6	3	216
45.	2^6	2	6	64

46. $8^2, 2^7, 3^5, 5^4$ **47.** $12^2, 9^3, 4^5, 7^4$ **48.** 1.44
49. 32.768 **50.** 15.625 **51.** 16.81 **52. a)** square **b)** square **c)** not square **d)** square **e)** not square **f)** square

2.10 More About Order of Operations

1. $7^3 = 343$ **2.** $9^2 = 81$ **3.** $3^3 = 27$ **4.** $3^4 = 81$
5. $5^3 = 125$ **6.** $1^5 = 1$ **7.** 12 **8.** 21 **9.** 116
10. 85 **11.** 10 **12.** 113 **13.** 53 **14.** 35 **15.** 200
16. 76 **17.** 202 **18.** 101 **19.** 39 **20.** 73
21. 171 **22.** 294 **23.** 81 **24.** 150 **25.** 405
26. 1440 **27.** > **28.** = **29.** > **30.** < **31.** <
32. > **33.** $81 + 64 - 49 = 96$ **34.** $4 \times 27 = 108$
35. $2 + 100 = 102$ **36.** $64 + 36 + 81 - 128 = 53$
37. Cell answers may vary.

a)

$2^3 - 1$	$2^3 - 8$	$2^2 + 1$
$3^2 - 7$	$2^4 \div 2^2$	$2^2 + 2$
$2^2 - 1$	$2^4 - 8$	$(8 - 7)^6$

b) The magic number is 12.

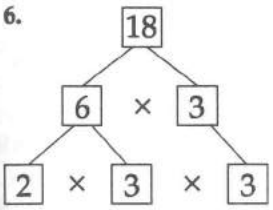
2.11 Problem Solving: Solve a Simpler Problem

1. 1245 **2.** 2400 **3.** 30 squares **4.** 50 000 steps
5. 264 games **6.** 72 elastics **7.** 77 times **8.** 21
9. 14 + 13 + 12 + . . . + 3 + 2 + 1 or 105

Test One Chapter 2: Number Theory

1. 1, 2, 4, 7, 14, 28 **2.** 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 **3.** 1, 5, 25 **4.** 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 **5.** 15, 21, 51, 24

6.



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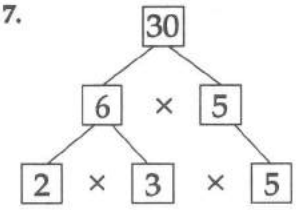

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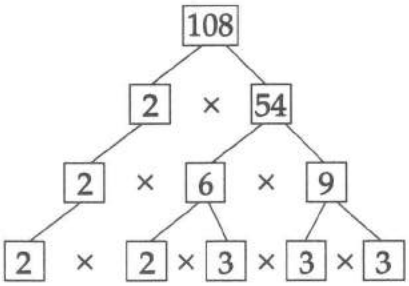

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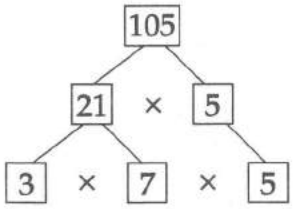
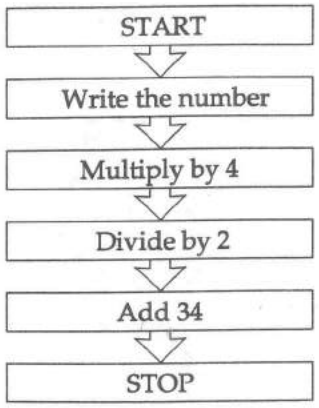


10. 1, 2, 7, 14 **11.** 1, 2, 11, 22 **12.** 24 **13.** 18
14. 7 **15.** 14 **16.** 24 **17.** 15 **18.** 42 **19.** 60
20. 10^3 **21.** 10^6 **22.** 10^4 **23.** 10^5
24. $11 \times 11 = 121$ **25.** $6 \times 6 \times 6 = 216$
26. $2 \times 2 \times 2 \times 2 \times 2 = 32$
27. $10 \times 10 \times 10 \times 10 = 10\,000$
28. $3 \times 3 \times 3 \times 3 = 81$ **29.** $5 \times 5 \times 5 = 125$
30. 4^2 **31.** 5^3 **32.** 12^2 **33.** 9^2 **34.** 9 **35.** 149
36. 113 **37.** 4

38.



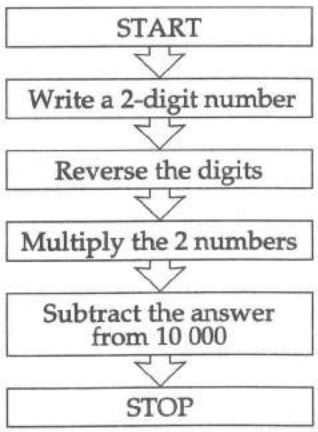
a) 60 **b)** 90 **c)** 152

Test Two Chapter 2: Number Theory

1. a) (1), (2), 3, (4), 6, (8), 12, (16), 24, 48;
(1), (2), (4), (8), (16), 32, 64, 128
b) (1), (2), (4), (8), 23, 46, 92, 184;
(1), (2), (4), (8), 22, 44, 88, 176
c) (1), (5), 13, (25), 65, 325;
(1), 2, 4, (5), 10, 20, (25), 50, 100, 125, 250, 500

2. 2, 31 **3.** 2, 59 **4.** 2 **5.** 2, 3 **6.** 13 **7.** 55
8. 25 **9.** 48 **10.** 60 **11.** 63 **12.** $4 \times 4 \times 4 = 64$
13. $9 \times 9 \times 9 = 729$ **14.** $2 \times 2 \times 2 \times 2 = 16$
15. $12 \times 12 = 144$ **16.** 7×10^4 **17.** 2×10^5
18. 16×10^6 **19.** 9×10^3 **20.** 768 **21.** 1350
22. 7776 **23.** 13 824 **24.** 400 **25.** 18 **26.** 554
27. 176 **28.** 60 **29.** 12

30.



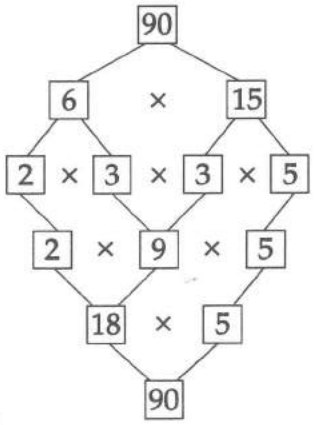
a) 6846 **b)** 9748 **c)** 7570

Extension Chapter 2: Number Theory

1. a) 70 385 **b)** 342 639 **c)** 5001 **d)** 62 780
Sum: 480 805 **2.** 70; 1, 10, 14, 20, 35
3. a) 60 103 **b)** 5983 **Difference:** 54 120
4–8. Answers may vary. **4.** $3 \times 5 \times 11$
5. $3 \times 4 \times 27$ **6.** $7 \times 8 \times 9$ **7.** $2 \times 8 \times 16$
8. $2 \times 8 \times 31$ **9.** 30 **10.** 42 **11.** 63 **12.** 24

13. 80 **14.** 30 **15.** 7 **16.** 9 **17.** 255; 1, 15, 51, 85, 255

18.



19. 16 bags

20. 2 red, 3 blue, and 8 green marbles

CHAPTER 3: Geometry

3.1 The Language of Geometry

1. A, B, C **2.** $\overleftrightarrow{PQ}$, $\overleftrightarrow{JK}$, $\overleftrightarrow{RS}$ or PQ, JK, RS

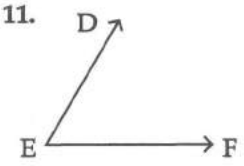
3. $\overrightarrow{BJ}$, $\overrightarrow{AR}$, $\overrightarrow{BK}$, $\overrightarrow{AS}$, $\overrightarrow{CS}$, $\overrightarrow{CK}$, $\overrightarrow{CJ}$, $\overrightarrow{BQ}$, $\overrightarrow{BP}$

4. ∠QAS, ∠RCJ, ∠KBP **5.** AB, BC

6. $\overrightarrow{AS}$, $\overrightarrow{BK}$ **7.** FG or $\overline{FG}$ **8.** $\overleftrightarrow{EF}$ **9.** $\overrightarrow{AB}$

10. ∠BAC

11.



12.

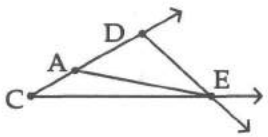
13.

14.

15. H, J, K, L, P **16.** Answers may vary.

16. $\overrightarrow{HK}$, $\overrightarrow{LJ}$, $\overrightarrow{KL}$ **17.** ∠HPK, ∠HPJ, ∠JPL, ∠KPL **18.** HL and JK

19.



3.2 Angles

1. ∠PQR, ∠RQP **2.** ∠XYZ, ∠ZYX

3. ∠ABC, ∠BCD, ∠CDA, ∠DAB

4. ∠XYZ, ∠YZX, ∠ZXY

5. ∠EFG, ∠GFH, ∠FHG, ∠HGF, ∠FGE, ∠GEF

6. ∠PTS, ∠TSR, ∠SRQ, ∠RQP, ∠QPT

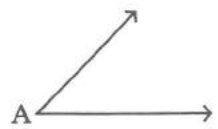
7. ∠GAH = 20° **8.** ∠BAF = 125°

9. ∠GAB = 160° **10.** ∠EAH = 90°

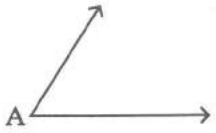
11. ∠DAH = 115° **12.** ∠BAH = 180°

13. ∠BAD = 65° **14.** ∠CAH = 158°

15.

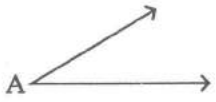


16.



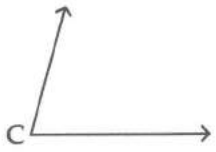
17.

18.



19.

20.



21. 25° **22.** 145°

3.3 Classifying Angles

1. right **2.** acute **3.** straight **4.** reflex
5. acute **6.** straight **7.** acute **8.** obtuse
9. right **10.** obtuse **11.** right **12.** acute
13. acute **14.** obtuse **15.** obtuse **16.** acute
17. obtuse **18.** reflex **19.** 48° **20.** 12° **21.** 58°
22. 18° **23.** 50° **24.** 76° **25.** 144° **26.** 56°
27. 95° **28.** 96° **29.** 27° **30.** 4° **31.** 34°
32. 110° **33.** 52° **34.** 70° **35.** 165° **36.** 25°

3.4 Problem Solving: Sequence the Operations

1. $18.33 **2.** 35 students **3.** $585.00 **4.** 98.1 cm
5. $1.75 **6.** Sandip paid more. The difference was $5.80. **7.** 34 560 words **8.** 1318 km

3.5 Lines: Intersecting, Perpendicular, and Parallel

1. AB and GH, AB and IJ, EF and GH, EF and IJ
2. GH and IJ **3.** GH and CD, IJ and CD
4. No, AB is not parallel to EF. They are not the same distance apart at each point on the line and will eventually intersect.
5. ∠MSO = 90°, ∠RSP = 50°, ∠RSN = 140°, ∠MSR = 40° **6.** ∠PSN = 90°, ∠OSQ = 50°, ∠MSQ = 140°, ∠QSN = 40° **7.** 90° **8.** ∠NSO
9. ∠AGD = 50°, ∠DGH = 130°, ∠BHE = 50°, ∠CGA = 130° **10.** ∠FHG = 50°, ∠BHF = 130°, ∠CGH = 50°, ∠EHG = 130° **11–13.** Answers may vary. **11.** ∠AGD and ∠DGH; ∠BHE and ∠EHG; ∠GHF and ∠FHB; ∠HGC and ∠EHG
12. ∠BHE and ∠FHG; ∠AGC and ∠DGH
13. ∠DGH and ∠BHF; ∠AGD and ∠FHG
14. ∠x = 55°, ∠y = 125°, ∠z = 125°
15. ∠w = 115°, ∠x = 115°, ∠y = 65°, ∠z = 65°

3.6 Classifying Triangles

1. isosceles **2.** equilateral **3.** scalene

4. scalene **5.** obtuse **6.** acute **7.** right **8.** obtuse **9.** ΔBAC, ΔBCD, ΔBDE **10.** ΔBAC is acute and equilateral; ΔBCD is acute and scalene; ΔBDE is obtuse and isosceles. **11.** scalene, acute **12.** equilateral, acute **13.** isosceles, obtuse

3.7 The Sum of the Interior Angles in a Triangle

1. 55° **2.** 108° **3.** 24° **4.** 60° **5.** 32° **6.** 75° **7.** 108° **8.** 90° **9.** The 3 angles of an equilateral triangle are equal. Therefore, 180 ÷ 3 = 60°. **10.** $\angle a = 60°$, $\angle b = 60°$, $\angle c = 60°$, $\angle d = 30°$, $\angle e = 30°$, $\angle f = 120°$ **11.** 61° **12.** 46° **13.** 65° **14.** 126° **15.** $\angle A = 75°$, $\angle B = 126°$, $\angle D = 69°$, $\angle C = 90°$. The sum of $\angle A + \angle B + \angle D + \angle C$ is 360°, which is the sum of the angles in a quadrilateral.

3.8 Problem Solving: Use a Table

1. a) $3.80 **b)** $21.25 **c)** $42.00 **d)** $78.00 **e)** $130.65 **f)** $112.50 **2.** $3.65 **3.** $180.00 **4.**

Number of Rolls Sold	1	2	3	4	5	6	7
Cost of Rolls	18¢	36¢	54¢	72¢	90¢	108¢	126¢

5. a) $3.24 **b)** $4.32 **c)** $5.40 **6.** bicycling **7.** home exercises **8.** swimming **9.** Questions may vary. (1) Which activity is exactly twice as popular as tennis? (2) Which activity is 1% less than the sum of the percents for ice skating and cross-country skiing? (3) Which activity is 8% less than 3 times the percent for golf?

3.9 Polygons

1. 4 **2.** 5 **3.** 4 **4.** 8 **5.** 4 **6.** 10 **7.** 4 **8.** 9 **9.** 4 **10.** 3 **11.** 4 **12.** 7 **13.** right triangle, not regular, sides are not equal **14.** pentagon, regular **15.** rhombus, regular **16.** decagon, not regular, sides are not equal **17.** trapezoid **18.** parallelogram **19.** rectangle **20.** heptagon **21.** 3 rectangles, 6 rhombuses, 3 trapezoids, 6 triangles, 1 hexagon **22.** No. All the angles in a regular hexagon are equal and obtuse. **23.** rhombus **24.** parallelogram **25.** rectangle

3.10 Congruent Figures

1. A, N; B, K; C, T: D, M; E, L; F, R; G, P; H, O; I, S; J, Q **3.** AB = MN, BD = NP, AC = MO, CD = OP, $\angle A = \angle M$, $\angle B = \angle N$, $\angle C = \angle O$, and $\angle D = \angle P$ **4.** congruent **5.** congruent **6.** not congruent **7.** congruent **8.** not congruent **9.** not congruent

3.11 Problem Solving: Identify the Extra Information

1. 45 years **2.** 150 years **3.** first successful hydrofoil tested **4.** first steamer mail service **5.** 3067 goals **6.** 5.6 m **7.** $16.99 **8.** 95 years **9. a)** 521 381 people **b)** 113 455 people **10.** 432 tiles

Test One Chapter 3: Geometry

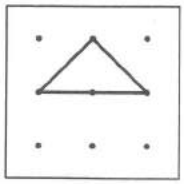
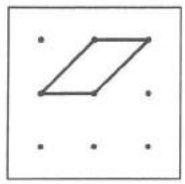
1–4. Answers may vary. **1.** A, B, C, D **2.** AB, BC, CD, AD **3.** $\angle ABC$, $\angle BCD$, $\angle CDA$, $\angle DAE$, $\angle BAE$ **4.** $\overrightarrow{BF}$, $\overrightarrow{CE}$ **5.** acute **6.** obtuse **7.** acute **8.** reflex **9.** right **10.** obtuse **11.** 32° **12.** 82° **13.** 70° **14.** 78° **15.** $\angle x = 60°$, $\angle y = 120°$, $\angle z = 60°$ **16.** $\angle x = 132°$, $\angle y = 48°$, $\angle z = 132°$ **17.** isosceles, obtuse **18.** scalene, right **19. a)** 41° **b)** 29° **20.** hexagon, not regular, sides are unequal **21.** square, regular **22.** quadrilateral, not regular, sides are unequal **23.** pentagon, not regular, sides are unequal **24.** AB = PQ, AC = PR, CD = RS, BD = QS, $\angle A = \angle P$, $\angle B = \angle Q$, $\angle C = \angle R$, $\angle D = \angle S$

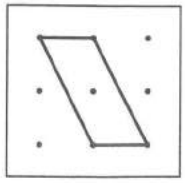
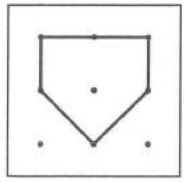
Test Two Chapter 3: Geometry

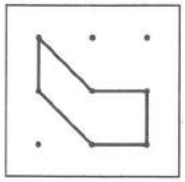
1, 2, 3, and 5. Answers may vary. **1.** GP, GH, HR **2.** $\angle AGE$, $\angle BGF$, $\angle DHF$, $\angle DHE$ **3.** $\overrightarrow{GF}$ and $\overrightarrow{RC}$ **4.** AB and EF **5.** $\angle DHE$ and $\angle CHF$ **6.** 45° **7.** 90° **8.** 45° **9.** 120° **10.** 75° **11.** 135° **12.** 15° **13.** 165° acute: $\angle MOP$, $\angle POQ$, $\angle QOR$, $\angle RON$; right: $\angle QON$; obtuse: $\angle POR$, $\angle PON$, $\angle MOR$ **14.** 54° **15.** 58° **16.** 28° **17.** in order from left to right: rhombus, hexagon, triangle. None of the figures are regular. The first has unequal angles; the second and third have unequal sides. **18.** intersecting **19.** perpendicular **20.** intersecting **21.** parallel **22.** 63° **23.** 54° **24.** 90° **25.** 63° **26.** obtuse, scalene **27.** AB = DE, BC = EF, AC = DF **28.** 36° **29.** $\angle DEF = 118°$, $\angle EFD = 26°$, $\angle EDF = 36°$

Extension Chapter 3: Geometry

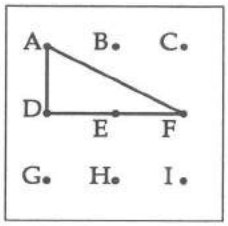
1. 9 points **2. a)** 12 lines **b)** 6 lines **c)** 0 lines **3.** 8 short diagonal lines, 2 long diagonal lines **4.** 5 squares **5.** 7 rectangles: one 2 units by 2 units, four 1 unit by 1 unit, and two 2 units by 1 unit

6. a)  b) 

6. c)  d) 

f) 

7–9. Answers may vary. 7. right - ∠AGI; acute - ∠CGI; obtuse - ∠AEH 8. BH and DF; CG and AI 9. DF and GI; AG and CI
10. ∠CEF = 45°, ∠GAI = 45°, ∠DBF = 90°
11. ∠AHI - obtuse, ∠ABE - right, ∠ACD - acute
12–13. Answers may vary.
12. ΔAGI and ΔDGH 13. ΔAFG
14. scalene, right angle 15. ΔADF



16. AD = DG, DF = GI, AF = DI, ∠A = ∠D, ∠D = ∠G, ∠F = ∠I

CHAPTER 4 Perimeter

4.1 Perimeter

1. metre 2. kilometre 3. centimetre 4. metre
5. millimetre 6. 4.2 m 7. 1.7 km 8. 65 cm
9. 8300 m 10. 560 cm 11–12. Estimates may vary. 11. 20 cm 12. 18.5 cm 13. 24.7 cm
14. 23.2 cm 15. 32.9 cm 16. 32.8 cm
17. 8.5 cm 18. 6.2 cm

4.2 Perimeters of Special Figures

3–7. Estimates may vary. 1. 15 cm 2. 10.4 cm
3. 11 cm 4. 25.4 cm 5. 25.8 cm 6. 36.2 cm
7. $P = 16$ 8. $P = 13$ 9. $l = 8$ 10. $w = 6$
11. $l = 10.1$ 12. 15.2 cm 13. 13.2 cm 14. 20 m
15. 24.8 cm 16. 48 cm 17. 52.2 cm
18. 19.2 cm 19. 13.5 cm 20. 16.2 cm 21. 12 m

4.3 Circumference

1. $d = 3.1$ cm, $C = 9.73$ cm 2. $d = 4.0$ cm, $C = 12.56$ cm 3. $d = 2.5$ cm, $C = 7.85$ cm
4. $C = 26.38$ cm 5. $C = 43.96$ cm
6. $C = 32.0$ cm 7. $C = 22.0$ cm 8. 37.68 cm
9. 16.33 cm 10. 51.81 cm 11. 20.10 cm
12. 75.99 cm 13. 64.06 cm 14. 7.2 m
15. minute hand, 60 cm; hour hand, 47 cm

4.4 Working with Perimeter

1. 64 cm 2. 70 cm 3. 56 cm 4. 200 cm
5. 248 cm 6. $148.20 7. $P = 90$ cm 8. 315 cm
9. 210 m 10. $6720.00 11. a) 14.6 m b) 2 rolls

4.5 Problem Solving: Find Missing Information

1. the numbers of the first and last apartment
2. the total mass of dog food in a bag 3. the length of a compact car 4. the age of Lise
5. the size of each tile 6. the number of runs scored last season 7. the number of baskets Bernie scored 8. The width is 10.2 cm. $P = 66.4$ cm 9. about 10 h 10. Answers may vary. 11. Answers may vary. 12. 52 years old
13. 325 years 14. 32 years

4.6 Area of a Rectangle and Square

1. square centimetre 2. square metre
3. square centimetre 4. square kilometre
5. square millimetre or square centimetre
6. 12.5 cm^2 7. 8.25 cm^2 8. 12.25 cm^2
9. 6.25 cm^2 10. 60 cm^2 11. 66.95 cm^2
12. 33.64 cm^2 13. 21.16 cm^2 14. 20.5 cm^2
15. 73.08 cm^2 16. 79.18 cm^2 17. 1375.5 cm^2
18. 153.12 cm^2 19. 5.76 cm^2 20. 2.89 cm^2
21. 153.76 cm^2 22. 576 cm^2 23. 432.64 cm^2

4.7 Areas of Figures

1. 71 cm^2 2. 208 m^2 3. 150 cm^2 4. 157.75 m^2
5. 135 cm^2 6. 490.84 cm^2 7. 16.16 m^2 8. 3.57 m^2

4.8 Area of a Parallelogram

1. 105 cm^2 2. 10.54 cm^2 3. 58.8 m^2
4. 37.62 cm^2 5. 0.51 cm^2 6. 35.51 cm^2
7. 158.4 cm^2 8. 27.16 cm^2 9. 117.52 cm^2
10. 152.25 cm^2 11. $b = 3.9$ cm, $h = 2.6$ cm, $A = 10.14$ cm^2 12. $b = 1.6$ cm, $h = 2.4$ cm, $A = 3.84$ cm^2 13. $b = 2.2$ cm, $h = 1.9$ cm, $A = 4.18$ cm^2 14. $h = 7$ cm 15. $b = 8$ m

4.9 Problem Solving: Use a Formula

1. a) 255 km b) 425 km c) 765 km
2. a) 3300 m b) 1320 m c) 2145 m
3. a) 600 N b) 100 N c) 6 times greater

4. a) \$62.50 b) \$33.33 c) \$175.00 d) \$240.00
5. a) 47.5 b) 69.5 c) 60 d) 63
6. $p = 65 + 5.50h$ a) \$285.00 b) \$197.00 c) \$257.50

4.10 Area of a Triangle

1. 60 cm^2 2. 65 cm^2 3. 24 cm^2 4. 52.25 cm^2
5. 55 cm^2 6. 12.92 cm^2 7. 63.6 cm^2
8. 31.5 cm^2 9. 53.94 cm^2 10. 63.18 cm^2
11. $b = 3.1$ cm, $h = 2.2$ cm, $A = 3.41$ cm^2
12. $b = 3.3$ cm, $h = 1.8$ cm, $A = 2.97$ cm^2
13. $b = 4.0$ cm, $h = 1.8$ cm, $A = 3.6$ cm^2
14. $b = 24$ m 15. $h = 9.7$ cm

4.11 Working with Area

1. 364 m^2 2. 7300 m^2 3. 20 4. $b = 4.0$ cm, $h = 2.0$ cm, $A = 4.0$ cm^2 5. $s = 2.0$ cm, $A = 4.0$ cm^2 6. $b = 4.0$ cm, $h = 1.6$ cm, $A = 6.4$ cm^2 7. $b = 2.5$ cm, $h = 2.2$ cm, $A = 5.5$ cm^2 8. 328.4 cm^2 9. 239.75 m^2
10. 126 m^2 11. 1272 cm^2 12. 9012 cm^2

4.12 Problem Solving: Use Logical Reasoning

1. Brigitte - 41, Fazil - 26, Berta - 18, Brian - 39
2. Maxine - non-fiction book, Maurice - novel, Gizella - video tape, Myriam - audio tape
3. Left to right: willow leaf, birch leaf, oak leaf, elm leaf, maple leaf 4. \$12.50 5. 6 coins
6. Curt - gerbil, Andrew - cat, Michael - parrot, Cathy - dog 7. Answers may vary. An example follows. — Dalia, Paul, Anna, and Abe each have a different type of running shoe. Dalia does not have to tie her running shoes. Paul's running shoes do not have laces, buckles, and they are not a brand name. Anna's running shoes do not not have stripes, buckles, nor are they a brand name. Abe's running shoes are a brand name. What colour is each person's running shoe?

Test One Chapter 4: Perimeter and Area

1. 36.6 cm 2. 52.8 cm 3. 37.68 cm
4. 31.36 cm^2 5. 127.5 cm^2 6. 54 cm^2
7. 140.65 cm^2 8. $P = 45.2$ cm, $A =$ ~~112.2~~ 99.6 cm^2
9. 41.38 cm^2 10. Deep end area = 700 m^2
Shallow end area = 300 m^2

Test Two Chapter 4: Perimeter and Area

1. 32.97 cm 2. 53.6 cm 3. 69.8 cm
4. 50.74 cm^2 5. 67.58 cm^2 6. 146.41 cm^2
7. 85.88 cm^2 8. $P = 41$ cm, A = 74.32 cm^2
9. $P = 60.6$ cm, $A = 197.47$ cm^2 10. 7.85 m
11. 608.45 m^2

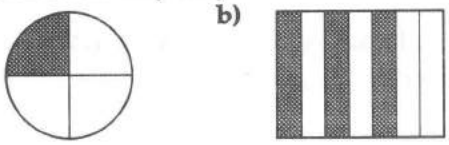
Extension Chapter 4: Perimeter and Area

1. Answers may vary. 2. Answers may vary.
3. Estimate: $P = 88$ cm, $A = 480$ cm^2
Actual: $P = 86.8$ cm, $A = 467.65$ cm^2
4. $b = 2.7$ cm, $h = 2.8$ cm, $P = 10.6$ cm, $A = 3.78$ cm^2 5. $s = 2.3$ cm, $P = 9.2$ cm, $A = 5.29$ cm^2 6. $b = 3.5$ cm, $h = 1.5$ cm, $P = 10.4$ cm, $A = 5.25$ cm^2 7. $l = 4.3$ cm, $w = 1.0$ cm, $P = 10.6$ cm, $A = 4.3$ cm^2
8. 11.25 cm^2 9. 9.02 m^2 10. a) $P = 11.6$ m, $A = 8.37$ m^2 b) Answers may vary.

CHAPTER 5 Fractions

5.1 The Meaning of Fractions

1. a) $\frac{1}{8}$ b) $\frac{7}{8}$ 2. a) $\frac{7}{16}$ b) $\frac{9}{16}$ 3. a) $\frac{4}{5}$ b) $\frac{1}{5}$
4. a) $\frac{5}{7}$ b) $\frac{2}{7}$ 5. a) $\frac{5}{8}$ b) $\frac{3}{8}$ 6. a) $\frac{9}{10}$ b) $\frac{1}{10}$
7. $\frac{3}{7}$ 8. $\frac{5}{7}$ 9. $\frac{1}{7}$ 10. $\frac{6}{7}$ 11. $\frac{5}{7}$ 12. $\frac{4}{7}$
13. a) $\frac{5}{21}$ b) $\frac{4}{21}$ c) $\frac{4}{21}$ d) $\frac{8}{21}$
14–16. Answers may vary.
16. a) b)



17. a) $\frac{14}{25}$ b) $\frac{4}{25}$ c) $\frac{2}{25}$

5.2 Equivalent Fractions

1–6. Answers may vary.
1. $\frac{3}{6}, \frac{1}{2}$ 2. $\frac{8}{12}, \frac{2}{3}$ 3. $\frac{4}{10}, \frac{2}{5}$ 4. $\frac{5}{8}, \frac{10}{16}$
5. $\frac{6}{16}, \frac{3}{8}$ 6. $\frac{18}{20}, \frac{9}{10}$ 7. $\frac{6}{8}$ 8. $\frac{4}{5}$ 9. $\frac{8}{12}$
10. $\frac{5}{6}$ 11. $\frac{8}{16}$ 12. $\frac{1}{3}$ 13. $\frac{5}{8}$ 14. $\frac{16}{24}$ 15. $\frac{15}{35}$
16. = 17. ≠ 18. ≠ 19. =
20. $\frac{4}{11}$ 21. $\frac{1}{5}$ 22. $\frac{1}{2}$ 23. $\frac{1}{8}$ 24. $\frac{2}{3}$ 25. $\frac{3}{5}$
26. $\frac{3}{4}$ 27. $\frac{1}{3}$ 28. $\frac{2}{5}$
29. $\frac{1}{3}$ and $\frac{9}{27}$, $\frac{1}{2}$ and $\frac{14}{28}$, $\frac{2}{5}$ and $\frac{18}{45}$, $\frac{3}{8}$ and $\frac{9}{24}$

5.3 Improper Fractions and Mixed Numbers

1. $1\frac{5}{8}, \frac{13}{8}$; $3\frac{3}{8}, \frac{27}{8}$ 2. $1\frac{5}{6}, \frac{11}{6}$; $2\frac{1}{6}, \frac{13}{6}$
3. $1\frac{1}{5}$

4. $2\frac{3}{4}$

5. $2\frac{2}{3}$ 6. $3\frac{1}{4}$ 7. $1\frac{4}{5}$ 8. $\frac{5}{3}$ 9. $\frac{21}{5}$

10. $3\frac{2}{5}$ 11. $1\frac{3}{8}, \frac{11}{8}$ 12. $2\frac{5}{6}, \frac{17}{6}$ 13. $6\frac{3}{5}$

14. $2\frac{1}{4}$ 15. $3\frac{2}{3}$ 16. $3\frac{5}{6}$ 17. $1\frac{5}{8}$ 18. $5\frac{2}{9}$ 19. $8\frac{1}{2}$

20. $2\frac{1}{7}$ 21. $7\frac{4}{5}$ 22. $\frac{7}{5}$ 23. $\frac{15}{4}$ 24. $\frac{21}{8}$ 25. $\frac{9}{2}$

26. $\frac{16}{3}$ 27. $\frac{13}{7}$ 28. $\frac{25}{4}$ 29. $\frac{32}{9}$ 30. $\frac{32}{3}$

5.4 Comparing and Ordering Fractions

1. $\frac{5}{7}$ 2. $\frac{8}{9}$ 3. $\frac{5}{8}$ 4. $\frac{3}{12}$ 5. $\frac{25}{30}$

6. $\frac{14}{21}$ 7. $\frac{15}{20}$ 8. $\frac{81}{90}$ 9. $\frac{66}{77}$

10. > 11. < 12. < 13. > 14. < 15. >

16. $\frac{1}{4}, \frac{7}{12}, \frac{2}{3}, \frac{5}{6}$ 17. $1\frac{1}{6}, \frac{17}{12}, 1\frac{5}{8}, \frac{9}{4}$

18. $1\frac{3}{4}, \frac{7}{5}, 1\frac{3}{10}, \frac{11}{20}, \frac{1}{4}$ 19. $3\frac{1}{3}, 2\frac{1}{5}, \frac{9}{5}, \frac{9}{10}, \frac{2}{15}$

20–23. Answers may vary.

20. $\frac{2}{5}, \frac{8}{9}, \frac{11}{12}, \frac{15}{17}, \frac{4}{7}$ 21. $\frac{2}{5}, \frac{4}{7}, \frac{15}{17}, \frac{8}{9}, \frac{11}{12}$

22. $\frac{5}{2}, \frac{9}{8}, \frac{12}{11}, \frac{17}{15}, \frac{7}{4}$ 23. $\frac{12}{11}, \frac{9}{8}, \frac{17}{15}, \frac{7}{4}, \frac{5}{2}$

5.5 Estimating Sums and Differences with Fractions

1. $\frac{1}{2}$ 2. 0 3. 1 4. $\frac{1}{2}$ 5. 0 6. 1 7. $\frac{1}{2}$

8. 0 9. $\frac{1}{2}$ 10. $\frac{1}{2}$ 11. $\frac{1}{2}$ 12. 1 13. 1 14. $\frac{1}{2}$

15. $1\frac{1}{2}$ 16. $1\frac{1}{2}$ 17. $\frac{1}{2}$ 18. 1 19. 0 20. 1

21. $\frac{1}{2}$ 22. $\frac{1}{2}$ 23. $\frac{1}{2}$ 24. $\frac{1}{2}$ 25. 0

26. a) $\frac{1}{2}$ of the book b) $\frac{1}{2}$ 27. $11\frac{1}{2}$ h

5.6 Adding Fractions

1. $\frac{3}{5}$ 2. $1\frac{3}{4}$ 3. $\frac{5}{9}$ 4. $1\frac{1}{2}$ 5. $\frac{2}{5}$ 6. $1\frac{2}{7}$

7. $\frac{5}{6}$ 8. $\frac{5}{12}$ 9. $\frac{8}{15}$ 10. $\frac{3}{4}$ 11. $1\frac{1}{10}$ 12. $1\frac{1}{9}$

13. 15 14. 28 15. 20 16. 36 17. 21 18. 18

19–24. Estimates may vary.

19. $1\frac{1}{2}, 1\frac{7}{15}$ 20. $\frac{1}{2}, \frac{13}{24}$ 21. $1, 1\frac{1}{12}$

22. $1, 1\frac{1}{12}$ 23. $1, 1\frac{1}{10}$ 24. $1\frac{1}{2}, 1\frac{11}{30}$

25. $1\frac{7}{24}$ 26. $1\frac{2}{3}$ 27. a) $\frac{2}{3}$ m b) $1\frac{5}{12}$ m

5.7 Subtracting Fractions

1. $\frac{2}{5}$ 2. $\frac{1}{2}$ 3. $\frac{3}{11}$ 4. $\frac{1}{3}$ 5. $\frac{5}{9}$ 6. $\frac{2}{5}$

7. $\frac{1}{8}$ 8. $\frac{1}{2}$ 9. $\frac{2}{3}$ 10. $\frac{2}{5}$ 11. $\frac{5}{9}$ 12. $\frac{3}{10}$

13. 12 14. 35 15. 36 16. 12 17. 10 18. 24

19–25. Answers may vary.

19. $0, \frac{7}{24}$ 20. $\frac{1}{2}, \frac{5}{12}$ 21. $0, \frac{5}{24}$ 22. $\frac{1}{2}, \frac{17}{36}$

23. $0, \frac{1}{10}$ 24. $\frac{1}{2}, \frac{11}{24}$ 25. $0, \frac{3}{20}$ 26. $\frac{1}{2}, \frac{11}{18}$

27. $\frac{5}{12}$ of the yard 28. $\frac{1}{8}$ L

5.8 Adding and Subtracting Mixed Numbers

1. $2\frac{4}{11}$ 2. $3\frac{5}{7}$ 3. $4\frac{8}{13}$ 4. $5\frac{3}{5}$ 5. $6\frac{3}{20}$

6. $5\frac{1}{6}$ 7. $4\frac{7}{18}$ 8. $5\frac{11}{12}$ 9. $3\frac{3}{4}$ 10. $7\frac{3}{8}$

11. $8\frac{7}{18}$ 12. $7\frac{3}{20}$ 13. $3\frac{1}{3}$ 14. $3\frac{1}{7}$ 15. $3\frac{1}{3}$

16. $1\frac{1}{6}$ 17. $1\frac{1}{10}$ 18. $2\frac{1}{8}$ 19. $1\frac{1}{6}$ 20. $1\frac{11}{12}$

21. $1\frac{3}{5}$ 22. $3\frac{1}{8}$ 23. $1\frac{13}{18}$ 24. $1\frac{5}{6}$ 25. $5\frac{7}{12}$ h

5.9 Multiplying Fractions

1. 8 2. 5 3. 4 4. 7 5. 12 6. 9 7. 20 8. 9

9. 21 10. $\frac{1}{6}$ 11. $\frac{1}{24}$ 12. $\frac{1}{4}$ 13. $\frac{9}{20}$ 14. $\frac{7}{12}$

15. $\frac{5}{28}$ 16. $\frac{1}{10}$ 17. $\frac{5}{8}$ 18. $\frac{2}{9}$ 19. 20 20. 8

21. $5\frac{1}{3}$ 22. 18 23. $22\frac{1}{2}$ 24. $2\frac{3}{4}$

25. \$12.00 26. 24 g 27. 120 km 28. 40 m

29. 33 kg 30. \$76.25 31. a) \$39.99 b) \$79.98
c) \$143.99 32. a) 25 min b) 600 min or 10 h

5.10 Reciprocals: Mental Math

1. $\frac{2}{1}$ or 2 2. $\frac{8}{3}$ 3. $\frac{5}{4}$ 4. $\frac{11}{2}$ 5. $\frac{1}{6}$ 6. $\frac{1}{12}$

7. $\frac{1}{4}, 4$ 8. $\frac{4}{5}, 1\frac{1}{4}$ 9. $\frac{2}{9}, \frac{9}{2}$

10. not reciprocals 11. not reciprocals 12. $2, \frac{1}{2}$

13. $\frac{5}{8}, 1\frac{3}{5}$ 14. not reciprocals 15. $\frac{15}{3}, \frac{1}{5}$ 16. 3

17. $\frac{7}{3}$ 18. $\frac{13}{15}$ 19. $\frac{5}{11}$ 20. $\frac{8}{9}$ 21. $\frac{1}{11}$ 22. $\frac{12}{11}$

23. $\frac{4}{17}$ 24. $\frac{9}{16}$ 25. $\frac{5}{3}$ 26. $\frac{1}{7}$ 27. $\frac{1}{1}$ or 1

28. $\frac{8}{19}$ 29. $\frac{6}{7}$ 30. $\frac{1}{1}$ or 1 31. $\frac{2}{7}$ 32. $\frac{11}{4}$

33. $2\frac{1}{2}$ h 34. $4\frac{1}{2}$ periods 35. 3 times taller

5.11 Dividing Fractions

1. $\frac{9}{7}$ 2. $\frac{6}{5}$ 3. $\frac{4}{3}$ 4. $\frac{2}{1}$ 5. $\frac{3}{4}$ 6. $1\frac{1}{4}$

7. $1\frac{1}{3}$ 8. $1\frac{1}{3}$ 9. $\frac{1}{2}$ 10. $5\frac{1}{4}$ 11. $3\frac{1}{3}$ 12. $2\frac{4}{7}$

13. $5\frac{1}{2}$ 14. $\frac{1}{12}$ 15. $\frac{1}{10}$ 16. $\frac{1}{35}$ 17. 5 18. 3

19. 16 20. $\frac{5}{18}$ 21. 7 22. 16 23. $\frac{10}{21}$ 24. $\frac{4}{15}$

25. $\frac{1}{6}$ 26. 20 27. $1\frac{3}{5}$ 28. $1\frac{1}{6}$ 29. $\frac{1}{36}$ 30. $2\frac{2}{3}$

31. $1\frac{1}{6}$ 32. 30 desserts 33. $\frac{3}{4}$ h 34. 80 km/h

5.12 Multiplying and Dividing Mixed Numbers

1. $3\frac{3}{8}$ 2. $2\frac{11}{12}$ 3. $1\frac{13}{15}$ 4. $16\frac{1}{3}$ 5. $11\frac{3}{7}$ 6. $5\frac{19}{20}$

7. $2\frac{11}{20}$ 8. $3\frac{1}{30}$ 9. $8\frac{1}{10}$ 10. \$154.00 11. 520 kg

12. 476 L 13. 72 m 14. $7\frac{1}{2}$ h 15. $181\frac{1}{2}$ h

16. $\frac{15}{4} \times \frac{4}{9} = 1\frac{2}{3}$ 17. $\frac{25}{8} \times \frac{9}{25} = 1\frac{1}{8}$

18. $\frac{6}{25}$ 19. $\frac{19}{56}$ 20. $13\frac{1}{3}$ 21. 3 22. $5\frac{1}{3}$ 23. $1\frac{7}{13}$

24. $1\frac{17}{35}$ 25. $2\frac{5}{6}$ 26. $\frac{11}{23}$ 27. 80 km/h

28. 15 min 29. 2 h

5.13 Decimals and Fractions

1. 0.3 2. 0.29 3. 0.157 4. 3.9 5. 2.23
6. 4.129 7. 0.4 8. 0.55 9. 0.125 10. 3.5
11. 11.8 12. 7.625 13. 0.6 14. 0.5 15. 6.7
16. 0.19 17. 0.45 18. $0.54\overline{}$ 19. 0.42 20. 2.83
21. $3.67\overline{}$ 22. $3.\overline{128}$ 23. $2.\overline{06}$ 24. $11.\overline{7}$
25. $5.\overline{681}$ 26. $0.\overline{16}$ 27. $0.\overline{45}$ 28. $0.\overline{4}$
29. $0.2\overline{7}$ 30. $0.\overline{037}$ 31. $0.0\overline{45}$
32. $\frac{53}{100}$ 33. $\frac{2}{5}$ 34. $\frac{3}{5}$ 35. $\frac{11}{50}$ 36. $\frac{17}{50}$ 37. $\frac{19}{1000}$
38. $\frac{4}{5}$ 39. $\frac{1}{250}$ 40. $\frac{9}{25}$ 41. $1\frac{3}{10}$ 42. $11\frac{1}{2}$
43. $7\frac{3}{40}$ 44. > 45. < 46. = 47. >

5.14 Order of Operations with Fractions

1. 7 2. 48 3. 30 4. 55 5. 87 6. 90

	a	b	$a+b$	$a-b$	$a \times b$	$a \div b$
7.	$\frac{2}{3}$	$\frac{1}{2}$	$1\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{3}$	$1\frac{1}{3}$
8.	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$	$\frac{1}{8}$	2
9.	$\frac{7}{8}$	$\frac{5}{6}$	$1\frac{17}{24}$	$\frac{1}{24}$	$\frac{35}{48}$	$1\frac{1}{20}$
10.	$\frac{2}{3}$	$\frac{2}{5}$	$1\frac{1}{15}$	$\frac{4}{15}$	$\frac{4}{15}$	$1\frac{2}{3}$

11. $\frac{7}{20}$ 12. $\frac{7}{20}$ 13. $\frac{8}{9}$ 14. $\frac{2}{5}$ 15. 1

16. $2\frac{2}{3}$ 17. 18 18. 24 19. 2 20. $\frac{1}{250}$ 21. 16

22. $8\frac{3}{4}$ 23. $\frac{3}{4}$ 24. $\frac{1}{12}$ 25. $10\frac{7}{8}$ 26. $\frac{11}{48}$

27. $\frac{1}{8} + \frac{3}{4} \times \frac{1}{3} \div \frac{7}{10}$ 28. $\left(\frac{5}{8} - \frac{1}{3}\right) \times \left(2\frac{1}{4} \div 2\frac{1}{2}\right)$

Test One Chapter 5: Fractions

1. $6\frac{3}{4}$ 2. $1\frac{4}{5}$ 3. $5\frac{4}{7}$ 4. $8\frac{1}{3}$ 5. $3\frac{1}{6}$

6. $6\frac{2}{11}$ 7. $\frac{11}{7}$ 8. $\frac{5}{2}$ 9. $\frac{31}{8}$ 10. $\frac{7}{4}$ 11. $\frac{29}{6}$

12. $\frac{67}{13}$ 13. $\frac{20}{25}, \frac{36}{45}$ 14. $\frac{24}{42}, \frac{40}{70}$ 15. $\frac{9}{39}, \frac{21}{91}$

16. $\frac{42}{66}, \frac{63}{99}$ 17. $\frac{1}{2}, \frac{3}{5}, \frac{7}{9}, \frac{7}{8}$ 18. $1\frac{1}{4}, \frac{11}{6}, \frac{11}{5}, \frac{7}{3}$

19. $\frac{2}{3}$ 20. $\frac{5}{11}$ 21. $1\frac{1}{4}$ 22. $\frac{1}{4}$ 23. $6\frac{1}{6}$ 24. $1\frac{5}{18}$

25. $5\frac{7}{12}$ 26. $1\frac{1}{2}$ 27. $\frac{2}{7}$ 28. $\frac{25}{36}$ 29. $3\frac{1}{5}$ 30. 12

31. $1\frac{8}{9}$ 32. $3\frac{3}{5}$ 33. $10\frac{1}{2}$ 34. 6 35. $7\frac{4}{5}$ 36. $2\frac{2}{3}$

37. $\frac{5}{108}$ 38. $10\frac{1}{10}$ 39. 0.75 40. 0.7 41. 0.31 42. $0.\overline{45}$

Test Two Chapter 5: Fractions

1. $\frac{12}{7}$ 2. $\frac{28}{9}$ 3. $\frac{24}{5}$ 4. $\frac{23}{12}$ 5. $\frac{44}{9}$ 6. $\frac{72}{13}$

7. $2\frac{3}{7}$ 8. $1\frac{9}{13}$ 9. $1\frac{3}{4}$ 10. $\frac{3}{8}$ 11. $\frac{2}{3}$ 12. $\frac{3}{5}$

13. $\frac{2}{3}$ 14. $\frac{5}{11}$ 15. $\frac{7}{13}$ 16. a) $\frac{1}{4}, \frac{3}{5}, \frac{7}{8}, \frac{9}{10}$

b) $1\frac{1}{3}, \frac{7}{5}, \frac{17}{12}, \frac{9}{6}, 1\frac{5}{6}$ 17. $1\frac{5}{24}$ 18. $\frac{13}{28}$ 19. $\frac{7}{24}$

20. $\frac{2}{15}$ 21. $8\frac{1}{12}$ 22. $2\frac{5}{9}$ 23. $6\frac{5}{8}$ 24. $2\frac{1}{6}$ 25. $\frac{3}{25}$

26. $\frac{3}{5}$ 27. $\frac{2}{7}$ 28. $1\frac{7}{8}$ 29. $4\frac{1}{8}$ 30. $1\frac{1}{3}$

31. $4\frac{7}{8}$ 32. $\frac{10}{23}$ 33. $\frac{20}{99}$ 34. $5\frac{5}{6}$

35. \$5.78 36. \$13.15 37. \$27.60 38. \$9.33
39. \$19.08 40. \$11.44

Extension Chapter 5: Fractions

1. a) $\frac{4}{8}, \frac{5}{10}, \frac{6}{12}, \frac{8}{16}, \frac{12}{24}$ b) $\frac{4}{12}, \frac{8}{24}$ c) $\frac{4}{16}, \frac{6}{24}$

2. $1\frac{1}{14}, 1\frac{2}{13}, 1\frac{1}{4}, 1\frac{4}{11}, 1\frac{1}{2}, 1\frac{2}{3}, 1\frac{7}{8}, 2\frac{1}{7}, 2\frac{1}{2}, 3\frac{3}{4}, 7\frac{1}{2}$

3. a) $\frac{1}{3}$ b) $\frac{1}{4}$ c) $\frac{1}{5}$

4. $\frac{1}{1\times2} - \frac{1}{2\times3} - \frac{1}{3\times4} - \frac{1}{4\times5} - \frac{1}{5\times6}$

The difference is $\frac{1}{6}$.

5. a) $\frac{1}{2} + \frac{1}{8}$ b) $\frac{1}{2} + \frac{1}{4}$ c) $\frac{1}{3} + \frac{1}{7}$ d) $\frac{1}{2} + \frac{1}{5}$

6. a) Addition: $\frac{11}{12}, \frac{19}{24}$ Subtraction: $\frac{1}{12}, \frac{1}{24}$

b) Multiplication: $\frac{3}{5}, \frac{7}{16}$ Division: $\frac{32}{35}, 1\frac{1}{2}$

7. A and E, B and H, C and G, D and F

8. $\left(1\frac{3}{10} + 1\frac{1}{2}\right)$, 2.87, $2\frac{7}{8}$, $(7 - 4.121)$, $\frac{1224}{425}$

9. a) > b) < c) < d) = 10. 4 and $\frac{1}{4}$

CHAPTER 6 Ratio and Rate

6.1 Ratio

1. 3:7 **2.** 5:3 **3.** 3:5 **4.** 7:15 **5.** 8:9 **6.** 9:5
7. 4:17 **8. a)** 29:30 **b)** 366:31 **9.** 47:60 **10.** 6:25
11. 33:100 **12.** 50:3 **13.** 3000:31 **14.** 240:23
15. 71:1000 **16.** 353:5000 **17.** 125:7
18. 233:4000 **19.** 5:4 **20.** 3:4 **21.** 12:5
22. a) 2:7 **b)** 7:10

6.2 Equivalent Ratios

1. 3:1 **2.** 5:1 **3.** $\frac{3}{2}$ **4.** $\frac{4}{7}$ **5.** 1:4 **6.** 3 to 2 **7.** $\frac{1}{3}$
8. 1 to 1 **9.** 8 wins to 3 losses **10.** 7 girls to 6 boys **11.** yes **12.** no **13.** yes **14.** yes
15. no **16.** no **17.** no **18.** yes **19.** 18:11
20. a) 7:4 **b)** 2:1 **c)** 2:1 **d)** 3:1 **e)** 3:4 **f)** 1:1
21. a) 7:5 **b)** 8:5 **c)** 1:2 **d)** 1:3 **22. a)** 1:3 **b)** 5:8

6.3 Solving Proportions

1. $\frac{3}{3}$ **2.** $\frac{7}{7}$ **3.** $\frac{5}{5}$ **4.** $\frac{2}{2}$ **5.** $\frac{12}{18}$ **6.** $\frac{9}{11}$ **7.** $\frac{42}{60}$ **8.** $\frac{4}{5}$
9. 5 **10.** 3 **11.** 1 **12.** 7 **13.** 48 **14.** 24 **15.** 9
16. 6 **17.** \$30.00 **18.** 14 **19.** 5 **20.** 15
21. \$18.00 **22.** \$75.00 **23.** 600 **24. a)** 12 cm **b)** 27 cm **c)** 36 cm **d)** 45 cm **25.** 100 cm

6.4 Similar Triangles

1. $\angle D = 52°$, $\angle E = 83°$, $\angle F = 45°$, ED = 10 cm, DF = 14 cm **2.** $\angle M = 115°$, $\angle N = 23°$, $\angle L = 42°$, MN = 5 cm, ML = 3 cm **3.** $\angle P = 53°$, $\angle R = 37°$, PQ = 18 m, PR = 30 m **4–6.** Explanations may vary. **4.** yes **5.** no **6.** yes
7. b) $\frac{3}{6}$, $\frac{4.2}{8.4}$, $\frac{4.2}{8.4}$ **8.** 6 m

6.5 Scale Drawings

1. 1:20 **2.** 1:100 **3.** 1:10 **4.** 100:1 **5.** 1:200
6. 5:1 **7.** 1:5000 **8.** 1:50 **9–16.** Answers may vary. **9.** 60 cm **10.** 5 mm **11.** 4.5 m **12.** 0.08 m
13. 250 cm **14.** 0.0125 cm **15.** 0.6 cm
16. 0.0245 cm **17.** 8 cm **18.** 1500 cm or 1.5 m
19. 600 cm or 6 m **20.** 2.1 cm by 1.7 cm
21. Dimensions of the drawing: 6 cm by 3.75 cm
22. a) 16 cm **b)** 16 000 cm or 160 m

6.6 Maps and Scales

1–8. Answers may vary. **1.** 400 cm **2.** 1250 cm
3. 750 cm **4.** 55 000 cm **5.** 500 000 cm or 5 km
6. 52 000 cm **7.** 2000 cm **8.** 12 500 000 cm
9–13. Answers may vary. **9.** 1260 km
10. 3024 km **11.** 252 km **12.** 3780 km
13. 1512 km **14.** Answers may vary.

6.7 Rates

1. 80 km/h **2.** 9 players/team **3.** 8 cans/box
4. \$3/hamburger **5.** 60 words/min
6. 12 books/box **7.** \$0.80/muffin
8. 8 pens/box **9.** 80 km/h **10.** \$0.60/can
11. 8 m/s **12. a)** \$78.75 **b)** \$420.00
13. a) 240 km **b)** 680 km **14.** \$147.75/night
15. 250 mL **16.** 1.15 goals/game **17.** 22 h/day
18. a) 6 km/h **b)** 7 km/h **c)** Kim **19.** \$186.00
20. 335.5 km

6.8 Unit Pricing

1. 40¢/kg **2.** 19¢/bun **3.** 37¢/can
4. \$1.52/kg **5.** \$1.25/L **6.** 40¢/grapefruit
7. 3 cans for \$1.00 **8.** 100 mL for \$1.79
9. 800 g for \$4.29 **10.** 2 kg for \$3.29
11. a) 33¢/pencil **b)** 66¢/eraser **c)** \$5.99/binder **d)** 89¢/marker **12. a)** \$6.62 **b)** \$1.96 **c)** \$3.23 **d)** \$3.96 **13. a)** \$1.06/100 g **b)** \$1.45/100 g **c)** \$0.89/100 g **d)** \$1.10/100 g **14.** \$492.00
15. 105 yen **16.** \$10.77

Test One Chapter 6: Ratio and Rate

1. 5:7 **2.** 9:4 **3–5.** Answers may vary. **3.** 3:4
4. 4:6 **5.** 4:5 **6.** 6 **7.** 30 **8.** 7 **9.** 4
10. 900 km/h **11. a)** 5:3 **b)** 3:5 **12.** AB = YX, AC = YZ, BC = XZ, $\angle A = \angle Y$, $\angle B = \angle X$, $\angle C = \angle Z$
13. $\angle X = 50°$, $\angle Y = 100°$, $\angle Z = 30°$, XY = 1 m, YZ = 1.5 m **14.** \$6.45/h **15. a)** \$11.00/shirt **b)** \$8.99/cassette **16.** 0.75 cm **17.** 450 km

Test Two Chapter 6: Ratio and Rate

1. 4:5 **2.** 3:4 **3–6.** Answers may vary. **3.** 4:1
4. 4:14 **5.** $\frac{10}{12}$ **6.** $\frac{16}{6}$ **7.** 3 **8.** 6 **9.** 8
10. 8 **11. a)** 5:3 **b)** 1:3 **12.** 50 words/min
13. $\angle R = 32°$, $\angle T = 58°$, RT = 4.7 m, RS = 4 m
14. 12 m **15. a)** \$0.95/muffin **b)** 65¢/pen
16. 600 000 cm or 6 km **17.** 210 cm or 2.1 m
18. a) \$6.50 **b)** \$7.25 **c)** Max, by \$0.75

Extension Chapter 6: Ratio and Rate

1. a) i) 12:13 **ii)** 7:18 **iii)** 9:16 **b)** E or P
2. a) 4 to 5 **b)** 3 to 7 **c)** 1 to 3 **d)** 1 to 4
3. a) 20 quarters, 16 dollar coins **b)** \$21.00
4. 12 000 **5. a)** 185 km **b)** 380 km **c)** 170 km **d)** 130 km **e)** 125 km **6.** 22.5 cm
7. 28 600 km/h

CHAPTER 7 Percent

7.1 Percent

1. 37% **2.** 83% **3.** 64% **4.** 94% **5.** 75%

6. 70% **7.** 100% **8.** 50% **9.** 37% **10.** 93%
11. 58% **12.** 21% **13.** 54% **14.** 13% **15.** 34%
16. 90% **17.** 75% **18.** 80% **19.** 50% **20.** 35%

21.

Week	Absences (%)
1	14
2	18
3	2
4	9
5	23
6	6

22. 42% **23.** $0.29 **24.** $0.32 **25.** $0.04
26. $0.73 **27.** $0.65 **28.** $0.88 **29.** 48%
30. a) 34% nickels **b)** 33% dimes **c)** 33% quarters

7.2 Fractions and Decimals as Percents

1. 50% **2.** 70% **3.** 60% **4.** 68% **5.** 38%
6. 5% **7.** 56% **8.** 75% **9.** 3% **10.** 60%
11. 61% **12.** 5% **13.** 20% **14.** 7% **15.** 3.5%
16. 45% **17.** 84% **18.** 68.5% **19.** > **20.** <
21. = **22.** > **23.** < **24.** >

	Decimal	Lowest Terms Fraction	Percent
25.	0.6	$\frac{3}{5}$	60%
26.	0.3	$\frac{3}{10}$	30%
27.	0.15	$\frac{3}{20}$	15%
28.	0.58	$\frac{29}{50}$	58%
29.	0.38	$\frac{19}{50}$	38%

30. 60% **31. a)** Stephan: 84% **b)** Stephan: 21 questions; Ellen: 20 questions; Blake: 20 questions **32.** 75% **33.** 27.5%

7.3 Percents as Fractions and Decimals

1. $\frac{3}{20}$ **2.** $\frac{9}{25}$ **3.** $\frac{11}{25}$ **4.** $\frac{9}{20}$ **5.** $\frac{2}{25}$ **6.** $\frac{3}{5}$
7. 0.16 **8.** 0.48 **9.** 0.03 **10.** 0.3 **11.** 0.05 **12.** 0.15
13. 0.14, $\frac{7}{50}$ **14.** 0.82, $\frac{41}{50}$ **15.** 0.10, $\frac{1}{10}$
16. 0.66, $\frac{33}{50}$ **17.** 0.75, $\frac{3}{4}$ **18.** 0.9, $\frac{9}{10}$

	Percent	Decimal	Fraction
19.	33%	0.33	$\frac{33}{100}$
20.	4%	0.04	$\frac{1}{25}$
21.	32%	0.32	$\frac{8}{25}$
22.	11%	0.11	$\frac{11}{100}$
23.	95%	0.95	$\frac{19}{20}$

24. = **25.** < **26.** > **27.** > **28.** = **29.** >
30. $\frac{3}{20}$, 0.15 **31.** $\frac{4}{5}$, 0.8 **32.** $\frac{1}{50}$, 0.02
33. 68% = 0.68, 25% = 0.25, 7% = 0.07
34. 68% = $\frac{17}{25}$, 25% = $\frac{1}{4}$, 7% = $\frac{7}{100}$
35. $\frac{3}{4}$ **36.** $\frac{8}{25}$

7.4 Finding a Percent of a Number

1. $\frac{9}{25}$, 0.36 **2.** $\frac{17}{25}$, 0.68 **3.** $\frac{2}{25}$, 0.08
4. $\frac{4}{5}$, 0.8 **5.** $\frac{7}{50}$, 0.14 **6.** $\frac{21}{50}$, 0.42
7. $\frac{1}{50}$, 0.02 **8.** $\frac{7}{10}$, 0.7 **9.** $\frac{89}{100}$, 0.89
10. 10 **11.** 25 **12.** 10.8 **13.** 2.8 **14.** 10.2
15. 25.5 **16.** $32.50 **17.** $1.32 **18.** $3.25
19. $540.00 **20.** $5.49 **21.** $4.75 **22.** 21 games
23. $7.44 **24.** $7.76 **25.** $2.17 **26.** $40.42
27. $99.68 **28.** $36.17

	Type of Travel	Students (%)	Number of Students
29.	Bus	20	125
30.	Car	12	75
31.	Cycle	4	25
32.	Walk	64	400

33. 224 g **34.** 128 g **35.** 244 g **36.** 160 g
37. a) 6 h **b)** 72 min

7.5 Estimating with Percent: Mental Math

All answers may vary. **1.** 50% **2.** 65%
3. 25% **4.** 90% **5.** 20 **6.** 50 **7.** 210 **8.** 15
9. 40 **10.** 100 **11.** $12 **12.** $32 **13.** $21
14. $20 **15.** $15 **16.** $90 **17.** 40% **18.** 66%
19. 66% **20.** 88% **21.** 80% **22.** 80% **23.** 10%
24. 7% **25.** Answers may vary. **26.** $15
27. $4 **28.** $35 **29.** $12 **30.** $7 **31.** $20

7.6 Finding the Percent

1. 50% **2.** 15% **3.** 40% **4.** 62.5% **5.** 27.5%
6. 60% **7.** 40% **8.** 25% **9.** 15% **10.** 13%
11. 38% **12.** 80% **13.** 73% **14.** 19%
15. a) 60% **b)** 37% **c)** 3% **16. a)** 72% **b)** 75%
17. a) 40% **b)** 7.5% **18. a)** 51% **b)** 47%

7.7 Percents Greater Than 100%

1. 1.31 **2.** 1.13 **3.** 2.87 **4.** 11 **5.** 3.75
6. 1.65 **7.** 4.72 **8.** 50.0 **9.** 7.3 **10.** 135
11. 280 **12.** 486 **13.** 2100 **14.** 172.5 **15.** 291.2
16. 159.6 **17.** 74.9 **18.** 140% **19.** 500%
20. 200% **21.** 2100% **22.** 28.75 **23.** 48.6

24. 118 **25.** 362.5 **26.** $874.47 **27.** 143%
28. 511% **29.** Answers may vary.

7.8 Simple Interest
7.9 Discount and Sale Price

1. $35.00 **2.** $27.00 **3.** $100.00 **4.** $580.00
5. $42.95 **6.** $20.88

	Borrowed Amount ($)	Interest Rate (%)	Interest Paid ($)	Amount Owing ($)
7.	175.00	10	17.50	192.50
8.	2750.00	13	357.50	3107.50
9.	460.00	11	50.60	510.60
10.	7139.00	14	999.46	8138.46
11.	1123.00	12	134.76	1257.76

12. $60.00 **13.** $951.95 **14.** $1665.00
15. $400.00 at 4% **16.** 13.49 **17.** 39.00 **18.** 48.00
19. $5.99, $33.96 **20.** $62.50, $187.49 **21.** $5.54, $12.91 **22.** $11.80, $47.20 **23.** $3848.25, $7146.75 **24. a)** $199.99 **b)** $202.49 **c)** Fitness Store, by $2.50

7.10 Goods and Services Tax (GST)
7.11 Provincial Sales Tax (PST)

Answers may vary for all questions.

7.12 Commission

1–8. Answers may vary. **1.** $18 **2.** $200
3. $160 **4.** $1900 **5.** $16 **6.** $140 **7.** $40
8. $750 **9.** $105.00 **10.** $570.00 **11.** $171.00
12. $197.58 **13.** $13.96 **14.** $120.00 **15.** $76.95
16. $1014.00 **17.** $501.60 **18.** $95.70
19. $11 340.00 **20.** $700.00 **21.** $149.25
22. a) $480.00 **b)** $80.00 **23. a)** salary plus 2% commission **b)** $3000.00

Test One Chapter 7

	Fraction	Decimal	Percent
1.	$\frac{1}{25}$	0.04	4%
2.	$\frac{17}{25}$	0.68	68%
3.	$\frac{4}{5}$	0.8	80%
4.	$\frac{7}{20}$	0.35	35%
5.	$\frac{3}{100}$	0.03	3%
6.	$\frac{9}{10}$	0.9	90%

7. 21 **8.** 13 **9.** 150 **10.** 117 **11.** 200%
12. 25% **13.** 14% **14.** 47.5%

	Loan Amount ($)	Interest Rate (%)	Interest Owed ($)	Total Owed ($)
15.	750.00	11	82.50	832.50
16.	625.00	13	81.25	706.25
17.	1500.00	15	225.00	1725.00
18.	520.00	12	62.40	582.40
19.	990.00	10	99.00	1089.00
20.	475.00	14	66.50	541.50

21. $175.00 **22.** $27.25 **23.** $49.95 **24.** $6.75
25. $45.99, $68.99 **26.** $114.00, $171.00
27. $91.99, $137.99 **28.** $49.91, $74.86 **29.** 5%
30. $11.37 **31.** 135% **32-33.** Answers may vary.

Test Two Chapter 7

1. 60% **2.** 75% **3.** 52% **4.** 54% **5.** 87.5 **6.** 77.5%
7. $\frac{13}{25}$ **8.** $\frac{11}{20}$ **9.** $\frac{1}{25}$ **10.** $\frac{21}{25}$ **11.** $\frac{27}{40}$ **12.** $\frac{17}{40}$
13. 1% **14.** 61% **15.** 70% **16.** 35% **17.** 119%
18. 425% **19.** $19.50 **20.** $40.20 **21.** $76.98
22. $708.12 **23. a)** $14 850.00 **b)** $15 889.50
24. $2386.50 **25.** Answers may vary.
26. 63.6% **27.** 433.3% **28.** $411.90 **29.** $401.04
30. $406.04 **31.** $456.62 **32.** $506.60
33. $345.30

Extension Chapter 7

1. 25% **2.** 25% **3.** 12.5% **4.** 12.5% **5.** 12.5%
6. 6.25% **7.** 18.18% **8.** 33.33% **9.** 29.17%
10. 37.50% **11.** 93.75% **12.** 71.43% **13.** 7.7
14. 33.8 **15.** 86.6 **16.** 28.7 **17.** 156.3 **18.** 9.7
19. 0.5 **20.** 63.2 **21.** 405 familes **22.** 69%
23. $19.00 **24.** $37.80 **25.** $77.00 **26.** $4.77
27. $74.80 **28.** $68.50 **29.** $1875.00
30. a) $310.75 **b)** $233.06 **c)** $77.69
31. Shirt B; the discount is $11.685, the sale price is then $27.26.

CHAPTER 8 Three-Dimensional Geometry

8.1 Three-Dimensional Figures

1. 6 **2.** 5 **3.** 6 **4.** 4 **5.** 7 **6.** 8 **7.** 6 **8.** 7
9. 5 **10.** 5 **11.** 3 **12.** 5 **13.** 6 **14.** 0
15. cone, cylinder, sphere **16.** 1 **17.** 1 **18.** 0
19. 6 **20.** triangular pyramid **21.** triangular prism **22.** cylinder **23.** rectangular prism or cube **24.** square pyramid **25.** pentagonal prism **26.** triangular prism and pentagonal pyramid **27.** cube and rectangular prism

8.2 Identifying and Classifying Polyhedra

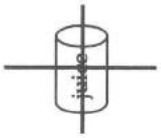
1. rectangular prism 2. square pyramid
3. rectangular pyramid 4. triangular prism
5. rectangle 6. edge 7. vertex 8. base
9. pentagonal pyramid 10. triangular prism
11. 8 rods, 5 blocks 12. 12 rods, 8 blocks
13. 10 rods, 6 blocks 14. 8 rods, 5 blocks
15. 9 rods, 6 blocks 16. 15 rods, 10 blocks
17. triangular prism 18. pentagonal pyramid
19. square pyramid 20. rectangular prism

8.3 Solids, Shells, and Skeletons
8.4 Planes of Symmetry

1. solid 2. shell 3. skeleton 4. solid
5. shell 6. solid

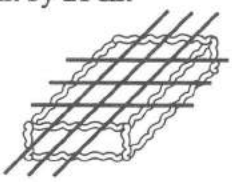
7. 

8. 

9. 

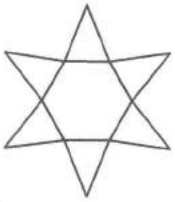
10. 

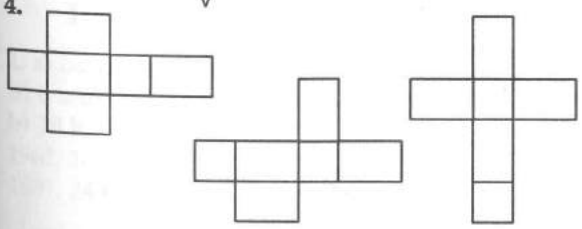
11. yes 12. yes 13. yes 14. no 15. 0.6 m by 1.8 m by 24 cm, 1.2 m by 1.8 m by 12 cm, 1.2 m by 0.9 m by 24 cm

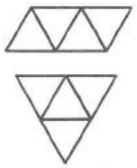
16. 

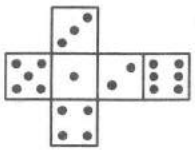
8.5 Nets of Polyhedra

1. square pyramid; CB, AB; AH, GH; GF, EF; ED, CD 2. triangular prism; AJ, IJ; BC, DC; AB, DE; EF, IF; HG, GF

3. 

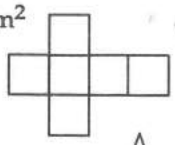
4. 

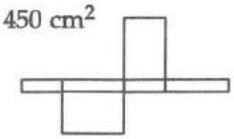
5. 

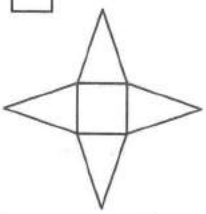
6. 

7. a) yes, cube b) yes, square pyramid c) no d) yes, triangular pyramid

8.6 Surface Area

1. 216 cm^2 

2. 450 cm^2 

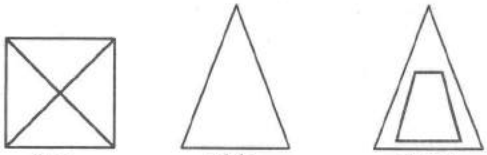
3. 168 cm^2 

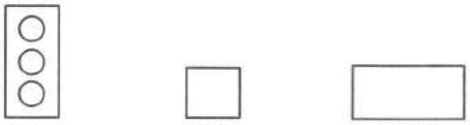
4. 337.5 cm^2 5. 444 cm^2 6. 736 cm^2
7. 177.35 cm^2 8. 2103 cm^2 9. cube, by 8 cm^2

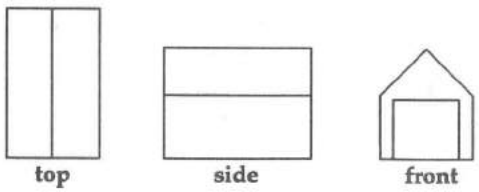
8.7 Regular Polyhedra: The Platonic Solids

1. 6 2. 4 3. 12 4. 20 5. 8 6. 12 edges, 8 vertices 7. 6 edges, 4 vertices 8. 30 edges, 20 vertices 9. 30 edges, 12 vertices
10. 12 edges, 6 vertices 11. triangular pyramid
12. 5 13. 6 14. a) 1:2 b) 1:5 c) 2:5
15. 64.8 cm^2

8.8 Perspectives of Objects

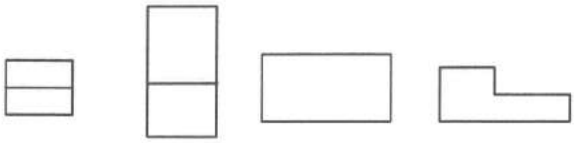
1. 

2. 

3. 

4. cylinder 5. rectangular prism 6. triangular pyramid

7. a) **b)** **c)** **d)**



8. a) **b)** **c)** **d)**

8.9 Volumes of Prisms

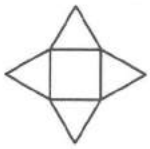
1. 10 608 cm^3 **2.** 420 cm^3 **3.** 1485 cm^3
4. 720 cm^3 **5.** 36 000 cm^3 **6.** 343 cm^3
7. 10 648 cm^3 **8.** 857.375 cm^3 **9.** 2000.376 cm^3
10. 195 cm^3 **11.** 185 cm^3 **12.** 796.95 cm^3
13. 15.98 m^3 **14.** 7573.5 mm^3 **15.** 15 000 cm^3
16. 16 254 cm^3

8.10 Volume, Capacity, and Mass

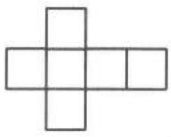
1. 0.35 L **2.** 5000 L **3.** 4.2 L **4.** 2500 L
5. 0.025 L **6.** 3 L **7.** 24 000 mL **8.** 7000 mL
9. 10 250 mL **10.** 700 mL **11.** 1050 mL
12. 6200 mL **13.** 0.25 g **14.** 500 g **15.** 8000 g
16. 1.14 g **17.** 8250 g **18.** 4.5 g **19.** 0.048 kg
20. 8000 kg **21.** 0.012 kg **22.** 850 kg
23. 0.35 kg **24.** 3.6 kg **25.** 500 g or 0.5 kg
26. 500 mL or 0.5 L **27.** 44.2 kg **28. a)** 26.64 m^3
b) 26.64 t **29. a)** 0.002 cm^3 **b)** 330 cm^3
c) 10.3 dm^3 or 10 300 cm^3 **d)** 122 cm^3

Test One Chapter 8: Three-Dimensional Geometry

1. square pyramid **2.** rectangular prism
3. triangular pyramid **4.** triangular prism
5. 6, 12, 8 **6.** 7, 15, 10 **7.** 5, 9, 6 **8.** 4, 6, 4
9. ABDC, ABFE; ACGIE, BDHJF; CGHD, EIJF
10. CG, GI (GH, CD); DH, HG (HJ, DC); FJ, JI (HJ, FE); EI, IJ (IG, EF) **11.** AB, CD (GH, IJ, EF); AC, BD; AE, BF; CG, DH (FJ, EI); GI, HJ; GH, IJ
12.



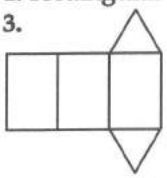
13.



14. Volume: 577.5 cm^3, Surface area: 512 cm^2
15. Volume: 12 cm^3, Surface area: 36 cm^2
16. Volume: 2197 cm^3, Surface area: 1014 cm^2
17. Volume: 2625 cm^3, Surface area: 1310 cm^2
18. a) 14 000 cm^3 **b)** 14 kg

Test Two Chapter 8: Three-Dimensional Geometry

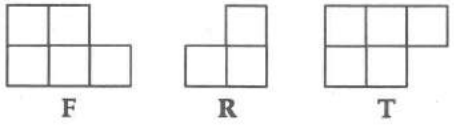
1. rectangular prism **2.** hexagonal pyramid
3.



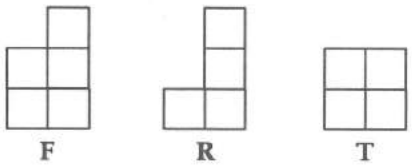
4. CD (GH, or EF) **5.** ABDC **6.** FH (AC, or BD) **7.** CDHG **8.** DH (CG, FH, or EG)
9. EG (AC, CD, or GH) **10.** 6 faces, 12 edges, 8 vertices **11.** 5 faces, 8 edges, 5 vertices
12. 5 faces, 9 edges, 6 vertices **13.** 6 faces, 10 edges, 6 vertices **14.** comma
15. exclamation mark **16.** period **17.** 84 cm^2
18. 174.4 cm^2 **19.** 384 m^2 **20.** 576 cm^2
21. 729 cm^3 **22.** 297 cm^3 **23.** 600 cm^3
24. 17.15 m^3 **25. a)** 512 cm^3 **b)** 384 cm^3

Extension Chapter 8: Three-Dimensional Geometry

1. $18.30 **2.** $14.70 **3.** $3.00 **4.** $6.05
5. 12 straws, 8 pipe cleaners **6.** 6 straws, 4 pipe cleaners **7.** 9 straws, 6 pipe cleaners
8. 15 straws, 10 pipe cleaners **9. a)** 3000 cm^3
b) 375 **10.** 1250 cm^3
11. a)



b)



12. 4 cm **13.** 114 kg

CHAPTER 9 Statistics

9.1 Collecting Data

1. a) Frequency: 1, 15, 6, 2, 4 **b)** guitar
c) guitar, piano, trumpet, trombone, flute
2. a) Ottawa to Vancouver, Calgary to Montreal, Toronto to Charlottetown, St. John's to Halifax, Winnipeg to Saskatoon **b)** 2843 km
3. a) Frequency: 17, 7, 12, 4 **b)** adventure
c) 40 **4.** Answers may vary.

9.2 Using a Sample to Make Predictions

1. 180 **2.** 102 **3. a)** 53%, 28%, 19%
b) In Favour 6360, Opposed 3360, Undecided 2280 **4. a)** 40%, 32%, 5%, 6%, 12.5%, 3%, 1.5% **b)** Country 1600, Rock or Pop 1280, Rap 200, Reggae 240, Classical 500, Jazz 120, Other 60 **5.** Answers may vary.

9.3 Reading and Drawing Pictographs

1. a) Day 1 – 80, Day 2 – 55, Day 3 – 70, Day 4 – 50, Day 5 – 85 **b)** 340 **c)** $506.60
2.

T-Shirt Sales	
Week 1	👕 👕 👕 👕
Week 2	👕 👕 👕
Week 3	👕 👕 👕 👕 👕 ½
Week 4	👕 👕 👕 👕 👕
Week 5	👕 👕 ½
Each 👕 represents $100 of T-shirt sales.	

3. a) Bryan Adams – $100 000, Rovers – $200 000 Northern Lights – $300 000 **b)** ◔ , ◑ , ◕
4. a) Frequency: 5, 10, 15, 15, 10

Favourite Summer Activity	
Cycling	☺
Canoeing	☺ ☺
Swimming	☺ ☺ ☺
Hiking	☺ ☺ ☺
Water-sking	☺ ☺
Each ☺ represents 5 people.	

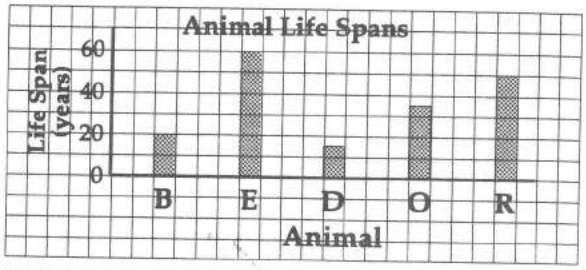
b) 55

9.4 Reading Bar Graphs and Broken-Line Graphs

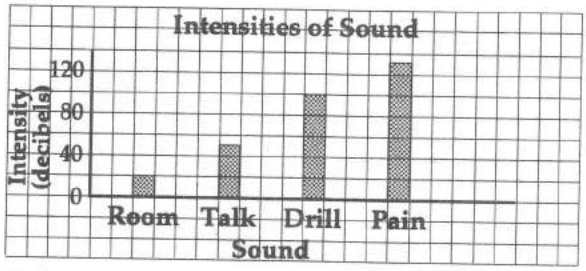
1. a) baseball **b)** 15 **c)** 115 **2. a)** 70 pulses/min **b)** 6 min **c)** 105 pulses/min **3. a)** children **b)** 18 h **c)** 1 h **4.** 1951, 14 million; 1961, 18 million; 1971, 22 million; 1981, 24 million; 1991, 27 million **b)** 13 million

9.5 Drawing Bar Graphs

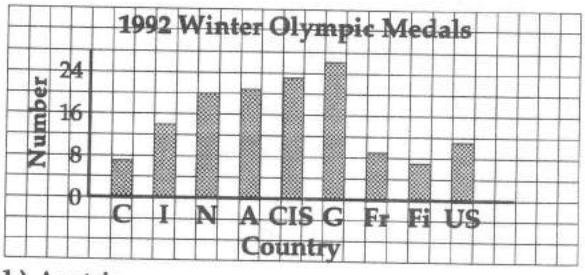
1. a)



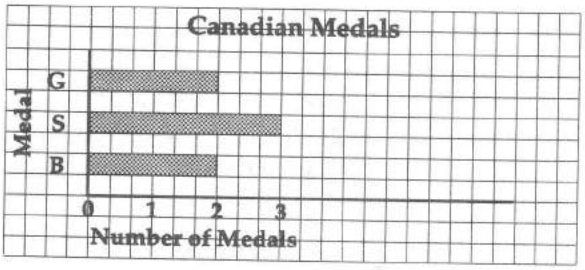
b) deer
2.



3. a)

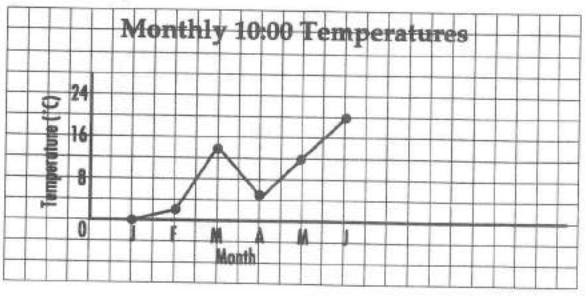


b) Austria
c)

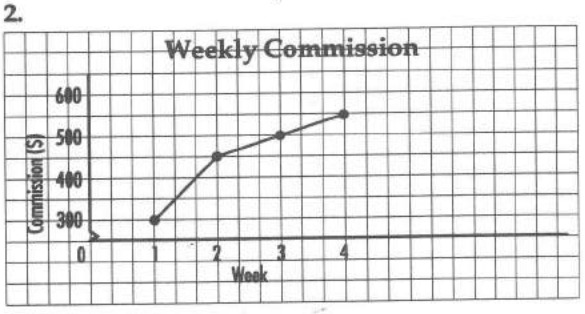


9.6 Drawing Broken-Line Graphs

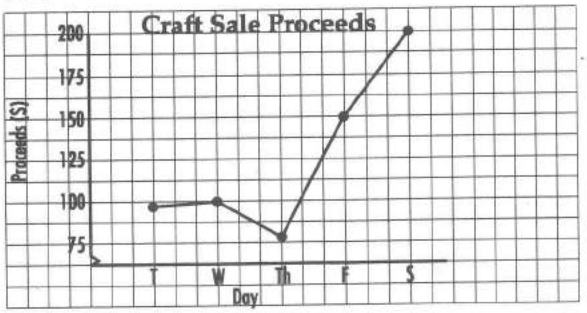
1.



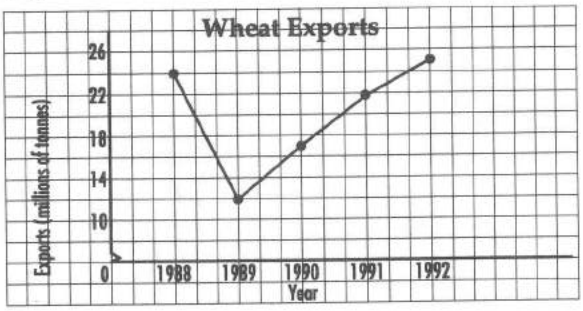
2.



3. a)



4. a)



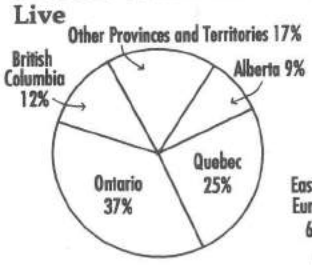
b) Answers may vary.

9.7 Reading Circle Graphs

1. a) 1 910 790 **b)** 5 459 400 **c)** 11 191 770
d) 5 459 400 **e)** 3 275 640 **2. a)** 83 208 km^2
b) 58 608 km^2 **c)** 24 420 km^2 **d)** 19 536 km^2
3. a) 39 kg **b)** 10.8 kg **c)** 1.8 kg **4. a)** $157.50
b) $87.50 **c)** $70.00 **d)** $35.00

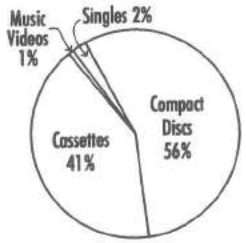
9.8 Drawing Circle Graphs

1. Where Canadians Live

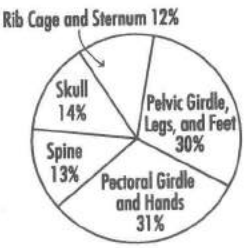


2. Refugee Origins

3. Audio Recordings



4. Bone Distribution



5. Answers may vary.

9.9 The Mean or Average

1. 20 **2.** 32 **3.** 31 **4.** 83 **5.** 72 **6.** 147 **7.** 86
8. 47 **9.** 207 **10.** 107 **11.** 20°C **12.** $100.63
13. a) 9 **b)** 25 **14.** range, 22; mean, 31.2
15. range, 33; mean, 88.2 **16.** range, 81; mean, 161.3
17. range, 101; mean, 225.1 **18.** range, 42; mean, 114.8 **19.** range, 180; mean, 804.2
20. range, 93; mean, 71.6 **21.** range, 372; mean, 826.3 **22.** 16

9.10 The Median and the Mode

1. 33 **2.** 80 **3.** 116 **4.** 303 **5.** 4 **6.** 36
7. 64, 68 **8-10.** Answers may vary.
11. a) mean, 75; median, 76; mode, 82
b) 6 **c)** 3 **d)** 7 **12. a)** Bethune, 49; Bombardier, 57; Hanlan, 53; Sawyer Hogg, 88; Laurence, 61; Pearson, 75; Pickford, 86; Stowe, 72 **b)** mean, 67.625; median, 66.5; range, 39
c) no **d)** 4 **e)** 4

9.11 Stem-and-Leaf Plots

1. median, 171.5; mode, 166; range, 41
2. median, 71; mode, 84; range, 63
3. a)

Days of Blowing Snow	
0	9 9 6 3
1	4 6 4 4 0
2	5 0 6
3	2 1

b) median, 14; mode, 14; range, 29 **c)** 5
4. a)

Points Scored in Grey Cup Finals	
1	7
2	7 6
3	3 5 4
4	0 3 7 9 8 3
5	8 4 7
6	4 1 1
7	4
8	3

b) median, 47.5; mode, 61; range, 66 **c)** 5

43

9.12 Possible Outcomes

1. 1, 2, 3, 4, 5, 6, 7, 8; equally likely **2.** PD, PN, PQ, DN, DQ, NQ; equally likely **3.** 1HH, 1HT, 1TT, 2HH, 2HT, 2TT, 3HH, 3HT, 3TT, 4HH, 4HT, 4TT, 5HH, 5HT, 5TT, 6HH, 6HT, 6TT; equally likely **4.** A, B, C, D; not equally likely; A is the most likely outcome. **5.** R, B, G; not equally likely; choosing a red marble is the most likely outcome. **6.** 2, 4, 6, 8, 10, 12; equally likely **7.** A1, A2, A3, A4, A5, A6, B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, C5, C6, D1, D2, D3, D4, D5, D6, E1, E2, E3, E4, E5, E6, F1, F2, F3, F4, F5, F6; equally likely **8.** M, A, T, H, E, I, C, S; not equally likely; choosing A is the most likely outcome. **9.** on its side or upside down; not equally likely because shape of cone is irregular

9.13 Probability

1. $\frac{1}{8}$ **2.** $\frac{1}{8}$ **3.** $\frac{1}{4}$ **4.** $\frac{1}{2}$ **5.** $\frac{4}{9}$ **6.** $\frac{2}{9}$ **7.** $\frac{1}{3}$ **8.** $\frac{1}{4}$

9. $\frac{1}{4}$ **10.** $\frac{1}{8}$ **11.** $\frac{3}{8}$ **12.** $\frac{3}{10}$ **13.** $\frac{1}{5}$ **14.** $\frac{1}{10}$ **15.** $\frac{3}{10}$ **16.** $\frac{7}{10}$

17. $\frac{1}{5}$ **18.** $\frac{1}{5}$ **19.** $\frac{3}{5}$ **20.** 1 **21.** 0 **22.** $\frac{2}{5}$ **23.** $\frac{1}{2}$ **24.** $\frac{1}{3}$

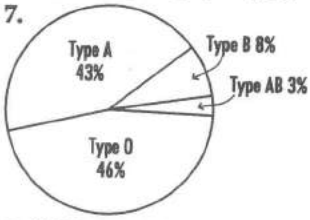
25. $\frac{1}{6}$ **26.** 0 **27.** $\frac{2}{3}$ **28.** $\frac{1}{2}$ **29.** $\frac{1}{8}$ **30.** $\frac{1}{2}$ **31.** $\frac{3}{8}$ **32.** $\frac{3}{8}$

33. 1 **34.** $\frac{3}{8}$ **35.** Answers may vary.

Test One Chapter 9: Statistics

1. 32 **2.** 10 **3.** 7 **4.** 10 **5.** 1, 5, and 6 **6.** 45

7.



8. $17.08 **9.** 15 **10.** Germany, CIS, Austria

11. $\frac{3}{11}$ **12.** $\frac{5}{11}$ **13.** $\frac{2}{11}$ **14.** $\frac{1}{11}$

Test Two Chapter 9: Statistics

1. 4100 km **2.** St. Lawrence, Mackenzie, Yukon **3.** March, April, May, June, July, August, September **4.** about 85 mm

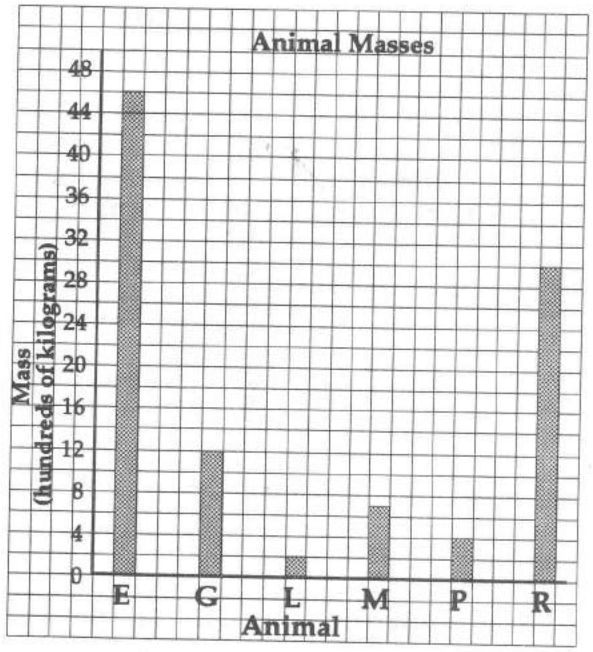
5.

6. Day 1 – 40, Day 2 – 60, Day 3 – 25, Day 4 – 45, Day 5 – 70, Day 6 – 75 **7.** 315 **8.** 10 cm

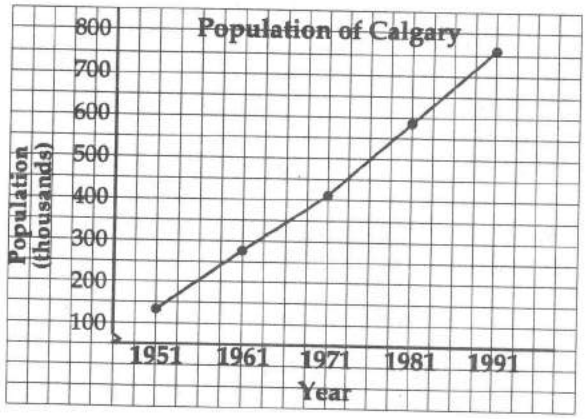
9. $\frac{1}{6}$ **10.** $\frac{1}{4}$ **11.** $\frac{1}{3}$ **12.** $\frac{1}{12}$ **13.** $\frac{1}{6}$

Extension Chapter 9: Statistics

1.



7.



8. 1967 **9.** 1050 thousand or 1 050 000

CHAPTER 10 Integers

10.1 Integers

1. positive four **2.** negative six **3.** zero
4. positive twelve **5.** negative eighteen
6. negative nine **7.** –6 **8.** +11 **9.** +4 **10.** –2
11. –20 **12.** +9 **13.** +4 **14.** –21 **15.** –6
16. +2 **17.** +33 **18.** –1

	Starting Temperature (°C)	Change (°C)	Final Temperature (°C)
19.	+9	down 4	+5
20.	+3	down 6	–3
21.	0	up 5	+5
22.	–1	down 3	–4
23.	–5	up 3	–2
24.	–3	up 4	+1

25. –8, +8 **26.** +60, –60 **27.** +25, –25 **28.** –11, +11 **29.** –9, +9 **30.** +3, –3 **31.** 9 points
32. +3°C

10.2 Comparing and Ordering Integers

1. < **2.** > **3.** > **4.** < **5.** < **6.** > **7.** +6
8. –2 **9.** +1 **10.** +2 **11.** –4 **12.** +4 **13.** –3
14. –2 **15.** +1 **16.** –5 **17.** –5 **18.** 0
19. +7, +3, +2, –1, –8 **20.** +10, +2, 0, –3, –10
21. +3, +2, +1, 0, –1 **22.** –6, –7, –8, –9, –11
23. +7, +4, 0, –1, –2 **24.** –3, –1, 0, +1, +3
25. –4, –3, –2, +1, +2 **26.** –1, 0, +5, +7, +8
27. –7, –4, 0, +2, +3 **28.** –3, –2, –1, +4, +6
29. –11, –7, –4, +1, +3 **30. a)** R **b)** I **c)** E, E **d)** first E, R **e)** INTEGER

10.3 Adding Integers

1. (+6) + (+3) = +9 **2.** (–3) + (–2) = –5
3. (+5) + (–2) = +3 **4.** (–5) + (+10) = +5 **5.** +10
6. +3 **7.** +3 **8.** –5 **9.** –1 **10.** –3 **11.** –5
12. –7

	Add.	+8	+3	–4	–1
13.	–3	+5	0	–7	–4
14.	+2	+10	+5	–2	+1
15.	–9	–1	–6	–13	–10
16.	+5	+13	+8	+1	+4

17. +4 **18.** –8 **19.** –1 **20.** –5 **21.** –4 **22.** +3
23. (+5) + (–3) + (–4) = –2
24. (–6) + (+4) + (–5) = –7
25. (–3) + (–3) + (+9) = +3
26. +6 **27.** –8 **28.** +10 **29.** –4

10.4 Subtracting Integers

1. –6 **2.** +2 **3.** –10 **4.** +1 **5.** –32 **6.** +21

	Addition	Subtraction
7.	(+8) + (+2) = +10	(+8) – (–2) = +10
8.	(–3) + (–4) = –7	(–3) – (+4) = –7
9.	(–2) + (–7) = –9	(–2) – (+7) = –9
10.	(+4) + (–6) = –2	(+4) – (+6) = –2
11.	(–5) + (+9) = +4	(–5) – (–9) = +4
12.	(+8) + (–3) = +5	(+8) – (+3) = +5

13. (+2), +5 **14.** (+7), +5 **15.** (–11), –2
16. (+4), +3 **17.** (–3), –8 **18.** (–2), +6
19. (+3) + (–3) = 0 **20.** (–6) + (+1) = –5
21. (+7) + (–2) = +5 **22.** (–4) + (–4) = –8
23. (+2) + (–4) = –2 **24.** (–1) + (+7) = +6
25. +16 **26.** –21 **27.** +6 **28.** +9 **29.** –9
30. +17 **31.** +6 **32.** +6 **33.** –8 **34.** +2
35. +10 **36.** –5 **37.** –3 **38.** +2 **39.** +12°C
40. +8°C **41.** +14°C **42.** +9°C **43.** +10°C
44. +8°C **45.** 396°C

10.5 Multiplying Integers

1. + **2.** – **3.** + **4.** – **5.** + **6.** – **7.** +28
8. –40 **9.** +36 **10.** –18 **11.** –32 **12.** –49
13. –33 **14.** +30 **15.** +144 **16.** –200 **17.** –120
18. +132 **19.** –300 **20.** +105 **21.** +48 **22.** –64
23. +4 **24.** –3 **25.** –6 **26.** –9 **27.** +7 **28.** –5
29. –7 **30.** +4 **31.** –12, –2 **32.** +6, –3
33. –4, +4 **34.** +8, +1 **35.** –6, +2 **36.** –3, +2
37. –5, –6 **38.** +9, –8 **39.** +7, 0 **40. a)** 6°C **b)** 9°C **c)** 18°C

10.6 Dividing Integers

1. –55 ÷ –11 = +5, –55 ÷ +5 = –11
2. +32 ÷ –4 = –8, +32 ÷ –8 = –4
3. –42 ÷ +6 = –7, –42 ÷ –7 = +6
4. +18 ÷ +9 = +2, +18 ÷ +2 = +9
5. + **6.** – **7.** + **8.** – **9.** + **10.** – **11.** +4
12. –9 **13.** –1 **14.** –3 **15.** +8 **16.** +3 **17.** +4
18. –3 **19.** –9 **20.** –8 **21.** 0 **22.** +3 **23.** –5
24. –2 **25.** +12 **26.** –42 **27.** +13 **28.** –7
29. –27 **30.** –10 **31.** +17 **32.** –4 **33.** –7
34. +2 **35.** +12 **36.** –3 **37.** –3 **38.** +6
39. –2°C

Test One Chapter 10: Integers

1. +10 **2.** –3 **3.** –5 **4.** +8 **5.** –3 **6.** +12
7. > **8.** > **9.** < **10.** < **11.** < **12.** <
13. +4, +2, –3, –7, –8 **14.** +3, 0, –7, –12, –13
15. +5, +1, 0, –1, –3 **16.** +3 **17.** +12 **18.** –4
19. –7 **20.** +4 **21.** –3 **22.** –16 **23.** +14
24. –18 **25.** –40 **26.** +14 **27.** +32 **28.** –3
29. –8 **30.** +6 **31.** +3 **32.** –4 **33.** –30 **34.** –5

35. +17 36. +28 37. –5 38. –2 39. –13
40. –8 41. –48 42. –7 43. –7 44. $42.00

Test Two Chapter 10: Integers

1. –50 2. –70 3. +36 4. +1, –1, –3
5. 0, +4, +8 6. +14, +19, +24 7. > 8. <
9. < 10. > 11. > 12. <
13. –6, –4, –2, 0, +3, +4 14. –4, –3, –1, +2, +4, +7
15. –7, –5, –3, 0, +2, +9 16. +10 17. –14
18. +23 19. –10 20. +3 21. +7 22. +9
23. –2 24. –3 25. –15 26. +7 27. –24
28. +28 29. +35 30. –48 31. +7 32. –4
33. –9 34. +3 35. +5 36. +1 37. –12
38. +7 39. +5 40. –1 41. –7 42. –8
43. –8°C

Extension Chapter 10: Integers

	Starting Temperature (°C)	Change (°C)	Final Temperature (°C)
1.	+9	down 5	+4
2.	–7	up 11	+4
3.	–3	down 6	–9
4.	+15	down 18	–3
5.	–14	up 20	+6
6.	+10	up 14	+24
7.	+4	down 8	–4
8.	–11	down 9	–20

9. P 10. E 11. S, V 12. +4 13. +8, –8
14. –1 15. POSITIVE

	Add.	–6	–5	+3	+10	–15
16.	–1	–7	–6	+2	+9	–16
17.	–7	–13	–12	–4	+3	–22
18.	+18	+12	+13	+21	+28	+3
19.	–13	–19	–18	–10	–3	–28
20.	–6	–12	–11	–3	+4	–21

	Subtract.	+3	–5	+10	–7	–3
21.	–5	+8	0	+15	–2	+2
22.	+17	–14	–22	–7	–24	–20
23.	–21	+24	+16	+31	+14	+18
24.	+6	–3	–11	+4	–13	–9
25.	–13	+16	+8	+23	+6	+10

	Multiply.	–3	+7	+9	–6	–1
26.	+6	–18	+42	+54	–36	–6
27.	–8	+24	–56	–72	+48	+8
28.	+4	–12	+28	+36	–24	–4
29.	+10	–30	+70	+90	–60	–10
30.	–7	+21	–49	–63	+42	+7

	Divide.	–20	+60	+40	–80	+100
31.	–2	+10	–30	–20	+40	–50
32.	+4	–5	+15	+10	–20	+25
33.	–5	+4	–12	–8	+16	–20
34.	+10	–2	+6	+4	–8	+10
35.	–1	+20	–60	–40	+80	–100

36.

+4	–3	+2
–1	+1	+3
0	+5	–2

CHAPTER 11 Algebra

11.1 Variables in Expressions

1. 9 2. 2 3. 21 4. 8 5. 21 6. 31 7. 13
8. 23 9. 18 10. 36 11. 14 12. 6 13. 12
14. 22 15. 8 16. 3 17. 42 18. 12 19. 12
20. 12 21. 7 22. 8 23. 16 24. 24 25. 6
26. 41 27. 6 28. 12 29. 0.24 30. 10
31. 1 32. 9.4 33. 0.8 34. 9.6 35. 4 36. 4
37. 16 38. 4 39. 2 40. 2

11.2 Words and Symbols

1. $n - 5$ 2. $6 + n$ 3. $n + 3$ 4. $\frac{4}{n}$ 5. $7n$
6. $\frac{n}{2}$ 7. 10 – n 8. a number decreased by 2
9. a number increased by 3 10. 9 multiplied by a number 11. a number divided by 5
12. the sum of 8 and a number 13. 4 divided by a number and decreased by 1 14. $9x$
15. $\frac{12}{n}$ 16. $11 + z$ 17. $y - 5$ 18. $x - 6$
19. $8y$ 20. $y + 4$ 21. $\frac{x}{3}$ 22. $\frac{x}{4}$
23. $x - 2$ 24. $18 \times h$

11.3 Solving Equations

1. $x = 4$ 2. $x = 9$ 3. $n = 9$ 4. $n = 4$ 5. $y = 3$
6. $y = 6$ 7. $x = 11$ 8. $x = 16$ 9. $n = 12$
10. $m = 13$ 11. $n = 8$ 12. $m = 3$ 13. $x = 6$
14. $x = 5$ 15. $x = 3$ 16. $x = 32$ 17. $x = 5$
18. $x = 7$ 19. $x = 2$ 20. $x = 9$ 21. $y = 12$
22. $y = 42$ 23. $y = 15$ 24. $y = 6$ 25. $y = 12$

26. $y = 24$ **27.** $x = 2$ **28.** $y = 6$ **29.** $m = 14$
30. $n = 13$ **31.** $y = 3$ **32.** $x = 35$ **33.** $x = 2$
34. $x = 4$ **35.** $m = 2$ **36.** $y = 7$ **37.** $x = 1.3$
38. $y = 3.7$ **39.** $m = 3.4$ **40.** $x = 1.1$

11.4 Solving Equations by Subtraction
11.5 Solving Equations by Addition

1. 5 **2.** 3 **3.** 4 **4.** 8 **5.** 9 **6.** $y = 7$
7. $x = 12$ **8.** $m = 22$ **9.** $n = 22$ **10.** $x = 24$
11. $y = 9$ **12.** $x = 2.2$ **13.** $y = 6.4$ **14.** $m = 8.5$
15. $z = 9.9$ **16.** $n = 18.4$ **17.** $x = 5.8$ **18.** 9
19. 5 **20.** 12 **21.** 8 **22.** 2 **23.** $x = 12$
24. $y = 34$ **25.** $z = 45$ **26.** $m = 33$ **27.** $n = 27$
28. $z = 27$ **29.** $m = 10.2$ **30.** $n = 17.5$
31. $x = 11.8$ **32.** $y = 17.7$ **33.** $m = 27.8$
34. $x = 9.6$

11.6 Solving Equations by Division
11.7 Solving Equations by Multiplication

1. 4 **2.** 6 **3.** 7 **4.** 5 **5.** 8 **6.** $p = 4$ **7.** $m = 7$
8. $n = 13$ **9.** $z = 5$ **10.** $x = 4$ **11.** $y = 9$
12. $x = 0.8$ **13.** $y = 2.1$ **14.** $z = 7.3$ **15.** $m = 0.6$
16. $p = 0.9$ **17.** $n = 0.8$ **18.** $n = 2.5$ **19.** $n = 0.8$
20. 4 **21.** 7 **22.** 5 **23.** 6 **24.** 2 **25.** $m = 32$
26. $p = 42$ **27.** $r = 24$ **28.** $x = 45$ **29.** $p = 8.6$
30. $r = 12$ **31.** $m = 13.6$ **32.** $n = 12.4$
33. $x = 9$ **34.** $y = 2.7$

11.8 Solving Equations in Two Steps

1. $x = 4$ **2.** $n = 5$ **3.** $t = 3$ **4.** $x = 7$ **5.** $p = 6$
6. $x = 9$ **7.** $t = 1$ **8.** $y = 8$ **9.** $n = 2$ **10.** $p = 4$
11. $y = 5$ **12.** $m = 3$ **13.** $m = 6$ **14.** $z = 2$
15. $z = 3$ **16.** $r = 6$ **17.** $x = 2$ **18.** $m = 3$
19. $y = 5$ **20.** $r = 4$ **21.** $z = 1$ **22.** $a = 3$
23. $x = 3$ **24.** $y = 4$ **25.** $z = 7$ **26.** $p = 3$
27. $x = 3$ **28.** $r = 8$ **29.** $p = 4$ **30.** $x = 7$
31. $t = 0.7$ **32.** $x = 0.5$

11.9 Writing and Reading Equations

1. $x + 2 = 8$ **2.** $\frac{x}{7} = 4$ **3.** $x - 3 = 11$
4. $y - 5 = 9$ **5.** $p + 13 = 18$ **6.** $4z = 16$
7. $6x = 18$ **8.** $x - 3 = 4$ **9.** $\frac{x}{2} = 9$ **10.** $x - 5 = 11$
11. $\frac{16}{x} = 4$ **12.** A number decreased by 7 is 14.
13. A number divided by 2 is 5. **14.** Four multiplied by a number is 28. **15.** A number increased by 9 is 26.
16. $\frac{x}{15} = 3$ **17.** $8x = 216$ **18.** $x + 7 = 21$
19. $x - 55 = 1000$ **20.** $x - 12 = 470$
21. $x + 5 = 65$ **22. a)** $h - 5 = 7$, $h = 12$
b) $4b = 36$, $b = 9$

11.10 Using Equations to Solve Problems

1. $3x = 39$, $x = 13$ **2.** $x + 7 = 15$, $x = 8$
3. $6x = 18$, $x = 3$ **4.** $x - 4 = 11$, $x = 15$
5. $\frac{x}{7} = 3$, $x = 21$ **6.** $13 + x = 21$, $x = 8$
7. $16 - x = 5$, $x = 11$ **8.** $\frac{x}{2} = 8$, $x = 16$
9. $2x + 3 = 17$; 7, 10 **10.** $6.25x = 156.25$; 25 h
11. $x + 23 = 49$; 26 **12.** $4x - x = 18$, $3x = 18$; 6, 24
13. $\frac{x}{3} = 16$; 48 kg **14.** $245.60 + x = 261.10$; \$15.50
15. $12w = 108$; 9 cm **16.** $2x + 26 = 46$; 10
17. $2x + x + 2x + 1 = 16$, $5x + 1 = 16$; 6, 3, 7
18. $2x = 12$, 6 days

11.11 Inequalities

1. F **2.** T **3.** T **4.** F **5.** T **6.** T **7.** T **8.** F
9. T **10.** 4, 5, 6, 7, 8, 9, 10 **11.** 0, 1, 2, 3, 4, 5, 6, 7, 8 **12.** 0, 1, 2, 3, 4, 6, 7, 8, 9, 10 **13.** 0, 1, 2, 3
14. 3, 4, 5, 6, 7, 8, 9, 10 **15.** 0, 1, 2, 3, 4, 5, 6
16. 3, 4, 5, 6, 7, 8, 9, 10
17 – 19. Answers may vary. **17.** $x \geq 3$, $x + 2 > 4$
18. $x \geq 7$, $x - 4 > 2$ **19.** $x \leq 4$, $x + 1 < 6$

20. $x > 5$

21. $x \leq 8$

22. $x < 7$

23. $x \neq 3$

24. $x \geq 3$

25. $x - 1 > 2$

26. $x + 5 < 11$

11.12 Tables of Values
11.13 Ordered Pairs

1.

x	$x + 4$
1	5
2	6
3	7
4	8
5	9

2.

x	$3x + 2$
1	5
2	8
3	11
4	14
5	17

3.

x	$2x - 1$
0	–1
3	5
5	9
1	1
6	11

4.

x	$x - 7$
2	–5
4	–3
0	–7
7	0
9	2

5. 6, 9, 12, 15 **6.** 1, 2, 3, 4 **7.** 11, 7, 3, –1

8. a) $1.75x$

Number of Hamburgers (x)	Cost ($)
1	1.75
2	3.50
3	5.25
4	7.00
5	8.75

b) $0.95y$

Number of Juices (y)	Cost ($)
1	0.95
2	1.90
3	2.85
4	3.80
5	4.75

9. a)

x	y
0	9
1	8
2	7
3	6
4	5

(0, 9), (1, 8), (2, 7), (3, 6), (4, 5)

b)

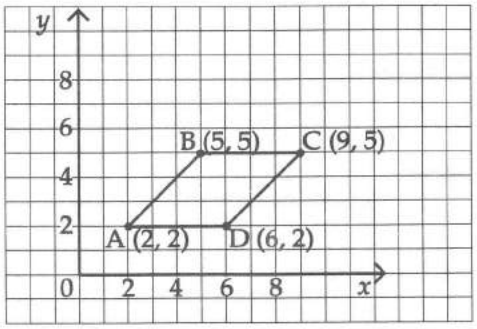
x	y
8	4
4	0
5	1
9	5
7	3

(8, 4), (4, 0), (5, 1), (9, 5), (7, 3)

10. a) (0, 13), (1, 12), (2, 11), (3, 10), (4, 9), (5, 8), (6, 7), (7, 6), (8, 5), (9, 4), (10, 3), (11, 2), (12, 1), (13, 0)
b) Answers may vary. (0, 3), (1, 4), (2, 5), (3, 6), (4, 7)

11.14 The Coordinate Plane

1. C(1,4) **2.** F(3, 5) **3.** H(6, 1) **4.** B(4, 9) **5.** D(5, 5)
6. G(8, 2) **7.** A(7, 5) **8.** J(0, 8) **9.** A(5, 5) **10.** B(2, 2)
11. C(9, 1) **12.** D(0, 4) **13.** E(3, 8) **14.** F(6, 2)
15. G(7, 7) **16.** H(9, 5) **17.** J(4, 0) **18.** K(2, 6)
19. a) and b)

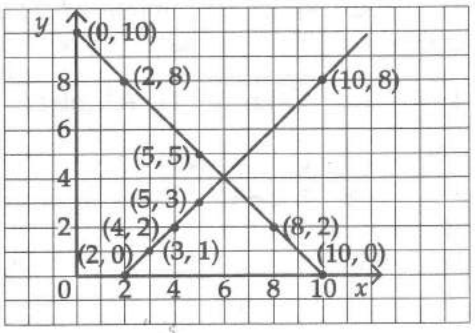


c) parallelogram
20. a) Answers may vary.

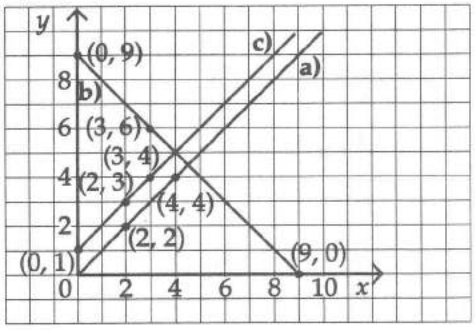
x	y
10	0
0	10
5	5
2	8
8	2

x	y
2	0
3	1
4	2
5	3
10	8

b) and c)

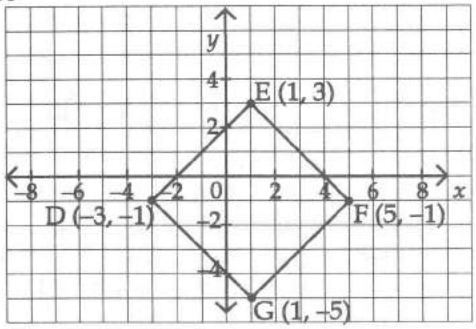


21. Answers may vary. **a)** (4, 4), (2, 2), (1, 1), (0, 0) **b)** (4, 5), (3, 6), (0, 9), (9, 0) **c)** (0, 1), (1, 2), (2, 3), (3, 4)
22.

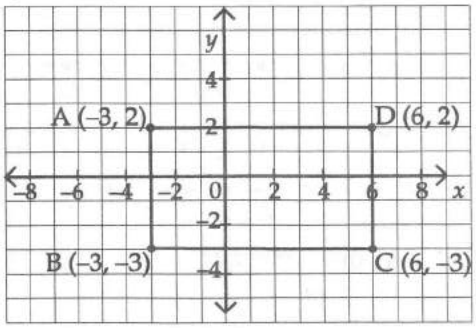


11.15 Graphing Ordered Pairs

1. A(–5, 3) **2.** B(–4, –3) **3.** C(6, –3) **4.** D(2, 4)
5. E(3, –2) **6.** F(7, 6) **7.** G(–3, 5) **8.** H(–6, –2)
9. J(0, –3) **10.** K(–2, 2) **11.** K(2, 1) **12.** F(3, 2)
13. E(0, –5) **14.** H(0, 5) **15.** B(3, –4)
16. C(–4, 3) **17.** G(–1, –3) **18.** J(4, 3)
19. A(5, 5) **20.** D(–4, –4)
21. square



22. rectangle, 45 square units



23. a) first **b)** second **c)** fourth **d)** third
e) third **f)** first **g)** fourth **h)** second

Test One Chapter 11: Algebra

1. $7x$ **2.** $4 + y$ **3.** $\frac{8}{x}$ **4.** $y - 3$ **5.** 18 **6.** 8
7. 20 **8.** 8 **9.** $x = 12$ **10.** $x = 3$ **11.** $x = 21$
12. $x = 6$ **13.** $x = 5.4$ **14.** $x = 5.2$ **15.** $x = 3.1$
16. $x = 28.8$ **17.** $n + 8 = 27, 19$ **18.** $6n = 108, 18$
19. $\frac{x}{4} = 22.40, \$89.60$

20. a) $x \geq 2$

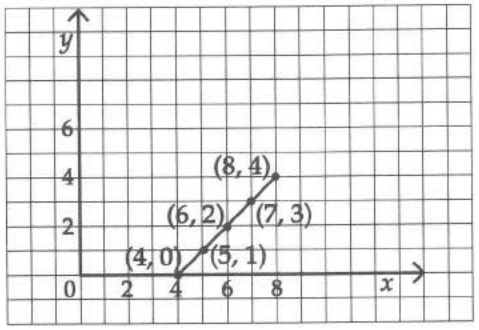
b) $x < 8$

c) $x \pi 5$

21.

x	y
4	0
5	1
6	2
7	3
8	4

b)



22. a) M(–1, –1), P(4, –2), S(–3, –2), J(2, 1)
b) A(4, 2), B(1, –1), C(1, 4), D(–2, 2)

Test Two Chapter 11: Algebra

1. 10.6 **2.** 1.3 **3.** 2.2 **4.** 2.3 **5.** a number increased by four **6.** six divided by a number **7.** a number multiplied by eight **8.** seven decreased by a number **9.** $x = 5$ **10.** $x = 16$
11. $x = 8$ **12.** $x = 8$ **13.** $x = 4.2$ **14.** $x = 2.9$
15. $x = 0.4$ **16.** $x = 10.5$ **17.** $2x + 4 = 28$; 12, 16
18. $l \times 9 = 135$, 15 cm
19. $x + 48 = 104$, 56

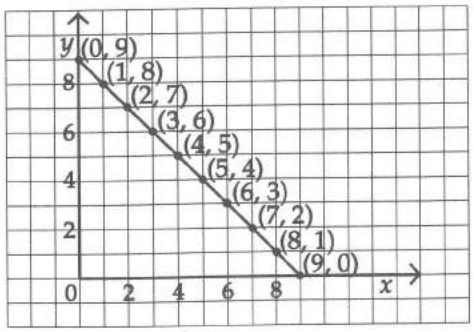
20. a) $x \leq 6$

b) $x > 3$

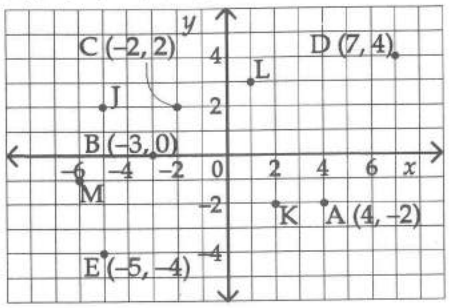
c) $x \neq 1$

21. a) (0, 9), (1, 8), (2, 7), (3, 6), (4, 5), (5, 4), (6, 3), (7, 2), (8, 1), (9, 0)

b)



22. a) J(–5, 2); K(2, –2); L(1, 3); M(–6, –1)
b)



Extension Chapter 11: Algebra

	x	y	$x + y$	$2x + 3y$	xy	$\frac{x+y}{2}$
1.	5	3	8	19	15	4
2.	4	3	7	17	12	3.5
3.	6	2	8	18	12	4
4.	4	1	5	11	4	2.5
5.	7	2	9	20	14	4.5

6. $2l + 2w = 50$, $l \times w = 150$; $l = 15$ cm, $w = 10$ cm **7.** $4s = 32$, $A = 64$ cm^2, $s = 8$ cm
8. a) 5.3, 5.4, 5.5, 5.6 **b)** 3.4, 3.7, 4, 4.3
c) 1.5, 2, 2.5, 3 **d)** 2, 3, 4, 5

9. a) $3\frac{1}{3}, 3\frac{1}{4}, 3\frac{1}{5}, 3\frac{1}{6}$

b) $6\frac{1}{3}, 6\frac{3}{4}, 7, 7\frac{1}{6}$

c) $6, 5\frac{1}{2}, 5\frac{1}{5}, 5$

10. a)

x	y
1	0
3	6
2	2
6	30
4	12

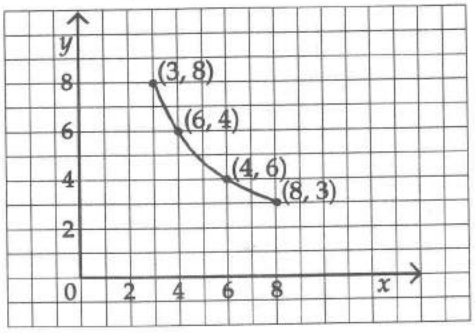
b)

x	y
4	0
10	2
19	5
16	4
25	7

11. a) $x + y = 6$ b) $y = 2x + 1$ c) $y = 3x - 2$

12. Answers may vary. a) (3, 8), (4, 6), (6, 4), (8, 3)

b)

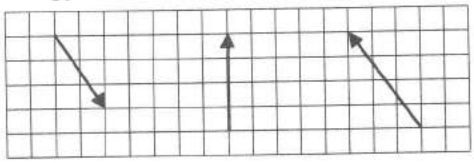


CHAPTER 12 Transformations

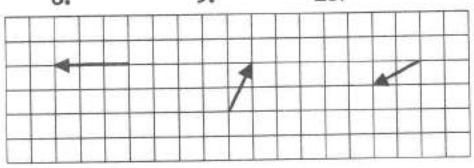
12.1 Translations

1. 2 units left, 3 units down 2. 3 units right, 5 units up 3. 4 units left 4. 5 units right, 3 units down

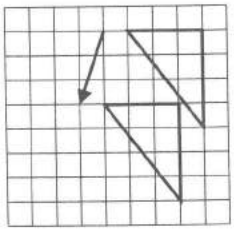
5. 6. 7.



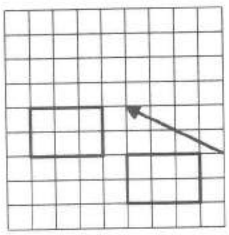
8. 9. 10.



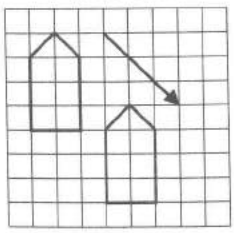
11. 1 unit left, 3 units down



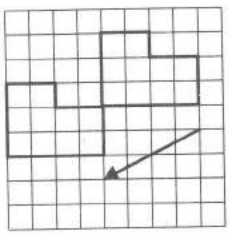
12. 4 units left, 2 units up



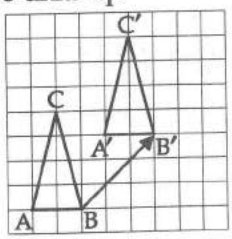
13. 3 units right, 3 units down



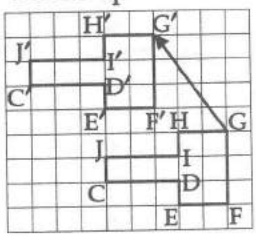
14. 4 units left, 2 units down



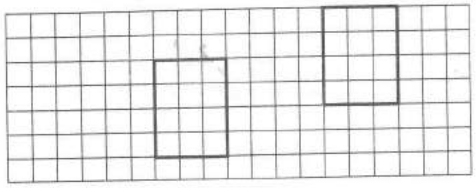
15. 3 units right, 3 units up



16. 3 units left, 4 units up



17.



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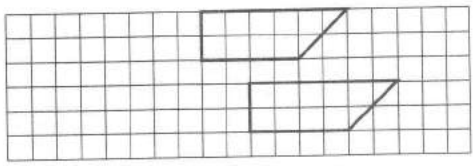
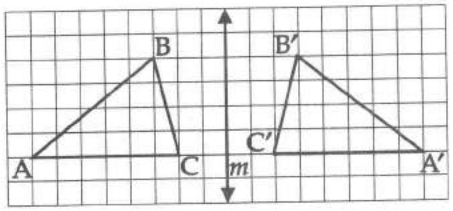


12.2 Reflections

1.



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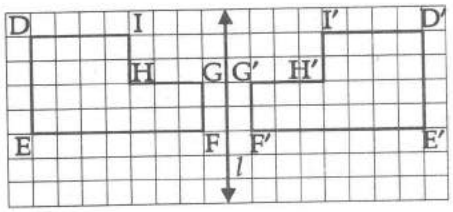

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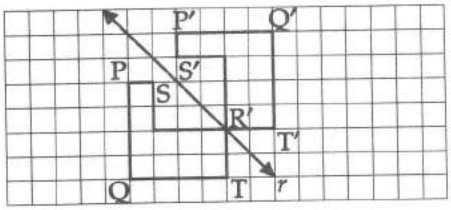

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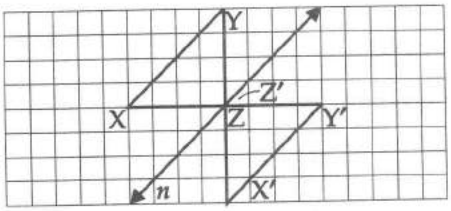

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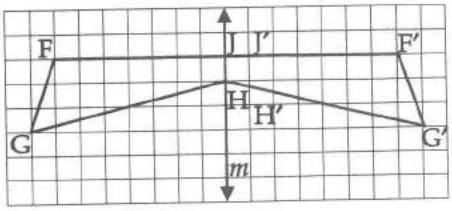
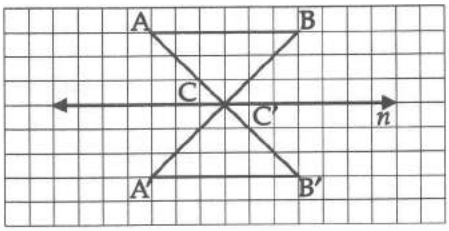
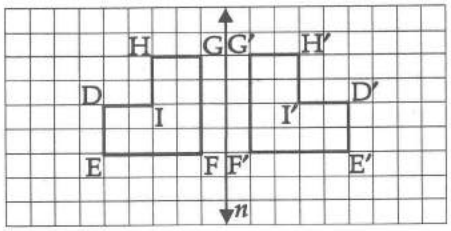
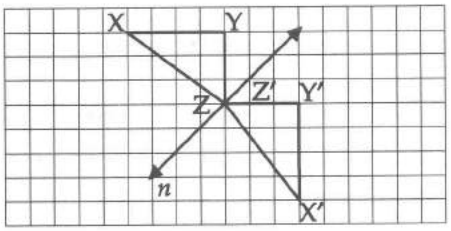
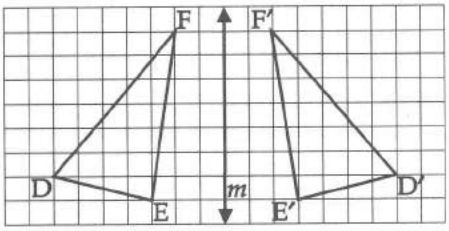


6. 

7. 

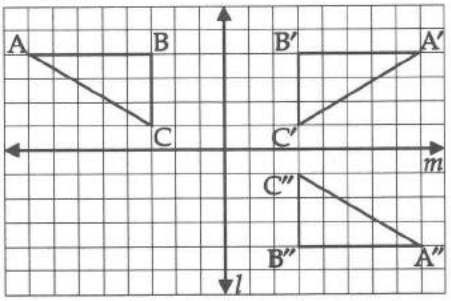
8. 

9. a) 

b) $\angle D = \angle D'$, $\angle E = \angle E'$, $\angle F = \angle F'$

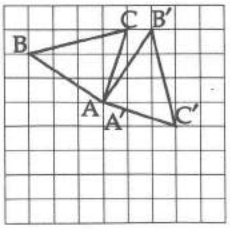
c) $DE = D'E'$, $DF = D'F'$, $FE = F'E'$

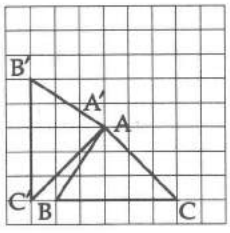
10. a) and b)

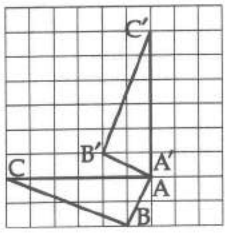


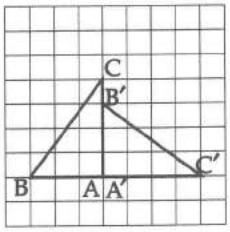
12.3 Rotations

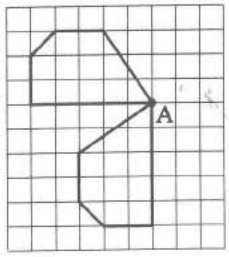
1. 180° cw, 180° ccw 2. 270° cw, 90° ccw

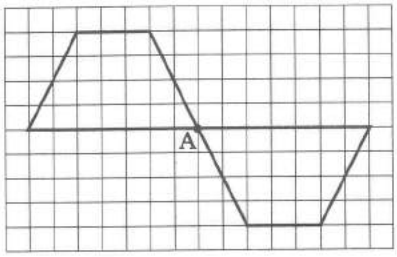
3. 

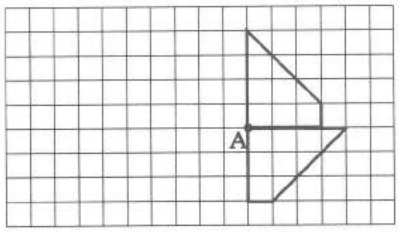
4. 

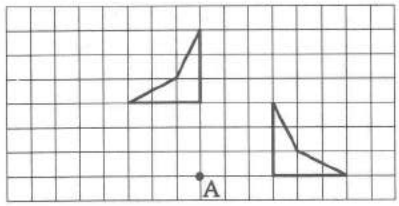
5. 

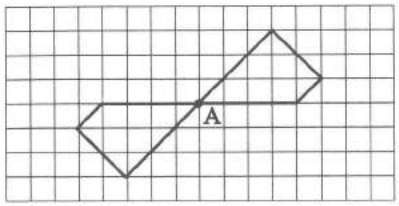
6. 

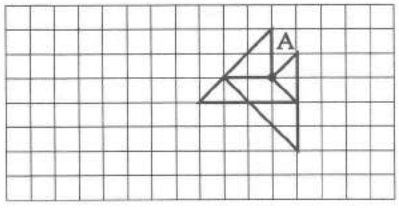
7. 

8. 

9. 

10. 

11. 

12. 

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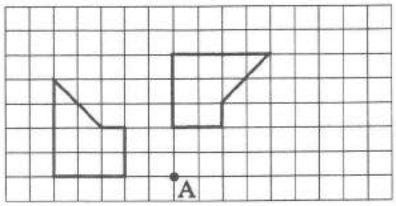
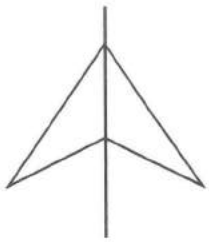
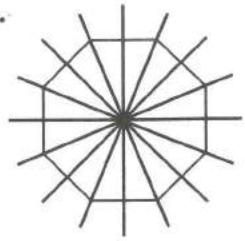


12.4 Lines of Symmetry

1.



2.



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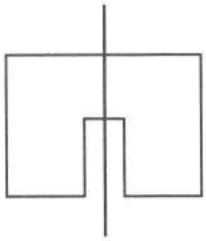
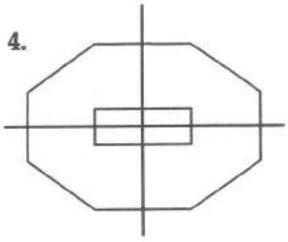


4.



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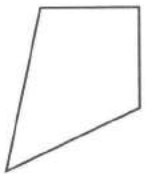

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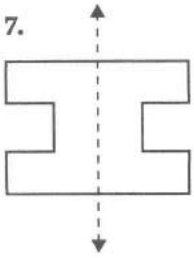

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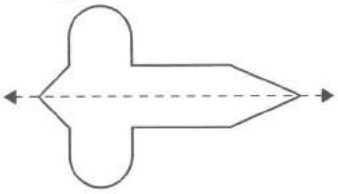

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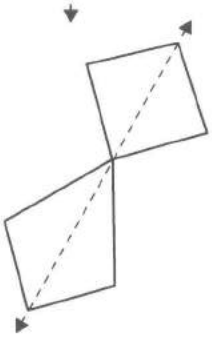

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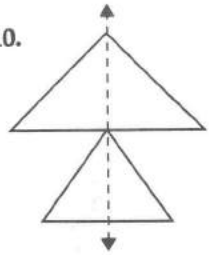

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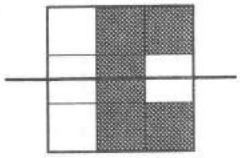

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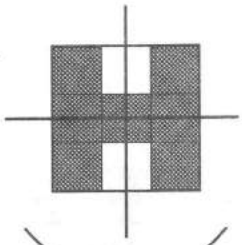

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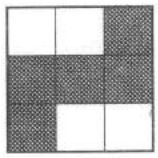

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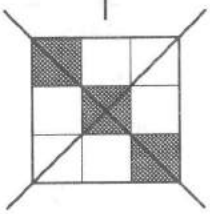

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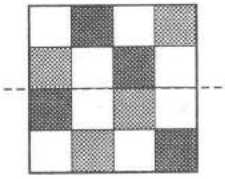

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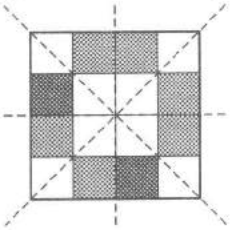

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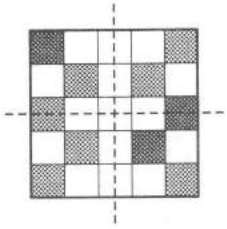

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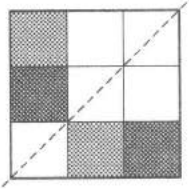
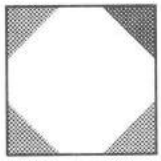


12.5 Rotational Symmetry

1. 1 2. 3 3. 4 4. 5

5.



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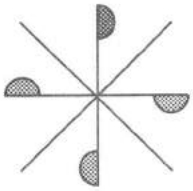

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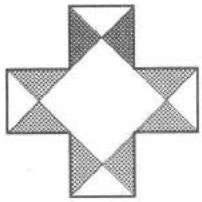

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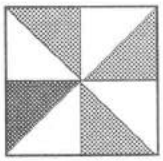

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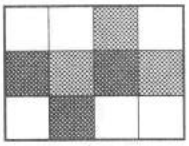
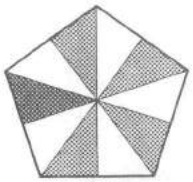


order 2

14.



order 5

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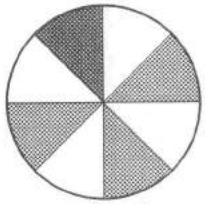

order 4

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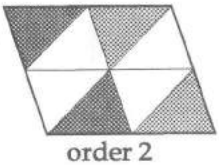
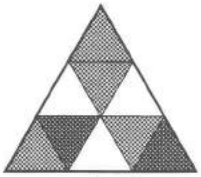
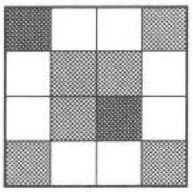


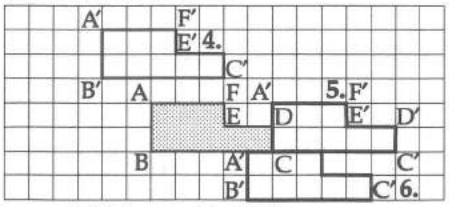
order 2

17. 
order 3

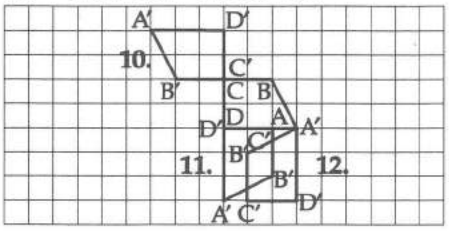
18. 
order 4

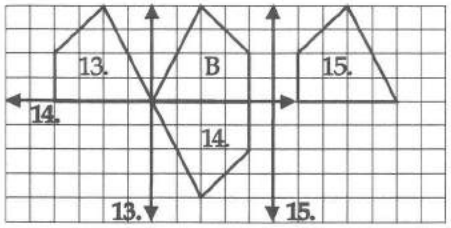
Test One Chapter 12: Transformations

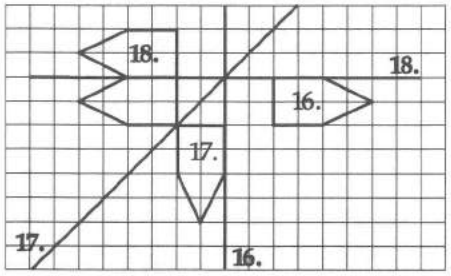
1. 2 units left, 3 units down 2. 6 units left
3. 9 units left, 2 units down

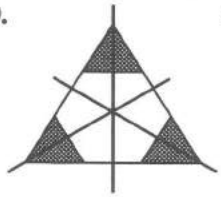
4.
5.
6. 

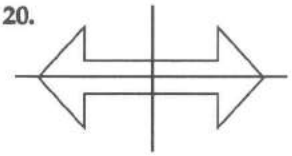
7. 270° cw 8. 90° cw 9. 180° cw

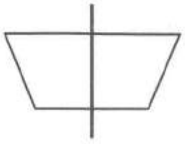
10.
11.
12. 

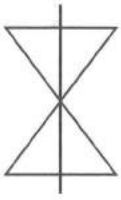
13.
14.
15. 

16.
17.
18. 

19. 

20. 

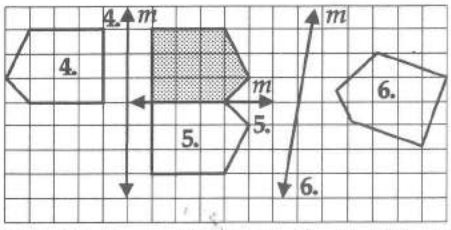
21. 

22. 

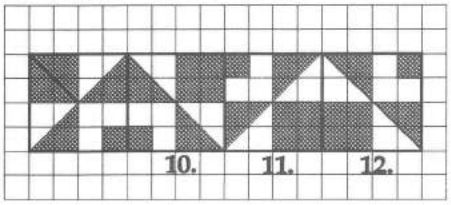
23. 4 24. 2 25. 1 26. 3

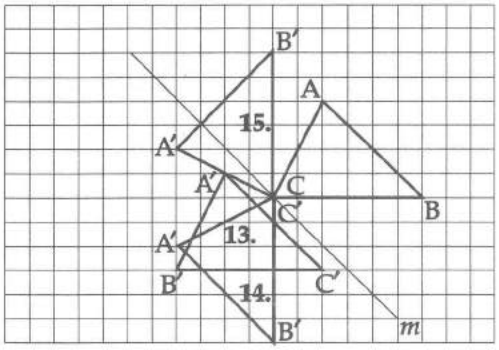
Test Two Chapter 12: Transformations

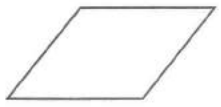
1. 6 units right, 1 unit up 2. 1 unit right,
3 units down 3. 10 units right, 2 units down

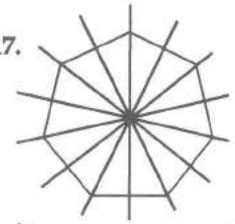
4.
5.
6. 

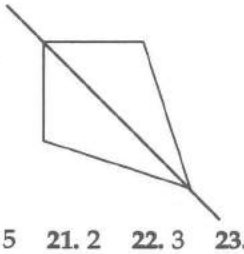
7. 270° ccw, A 8. 270° ccw, B 9. 90° ccw, B

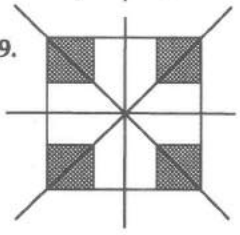
10.
11.
12. 

13.
14.
15. 

16. 

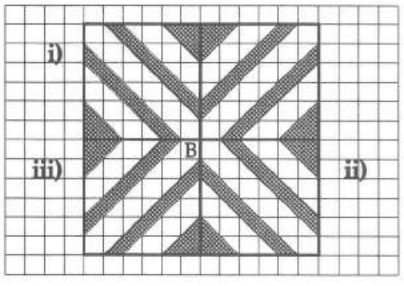
17. 

18. 

19. 

20. 5 21. 2 22. 3 23. 2

Extension Chapter 12: Transformations

1. i), ii), and iii) 

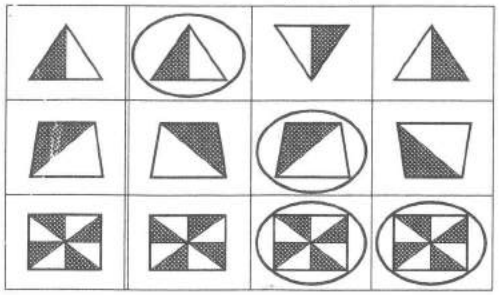
a) 4 b) 4 2. Answers may vary.

3.

a)

b)

c)

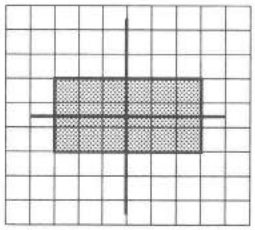


4. Answers may vary, depending on how the letters are drawn. a) A, B, C, D, E, K, M, T, U, V, W, Y b) H, I, O, X c) F, G, J, L, N, P, Q, R, S, Z d) H, I, N, S, X, Z 5. Answers may vary.
6. a) 2 b) 2 c) Answers may vary.
d) Answers may vary. 7. Answers may vary.

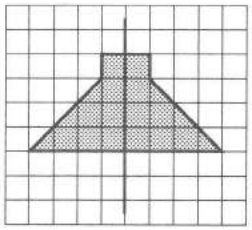
CHAPTER 13
Geometric Constructions

13.2 Constructing Bisectors

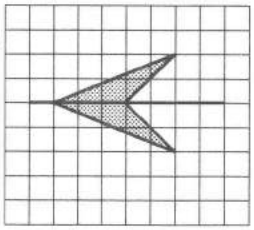
1.



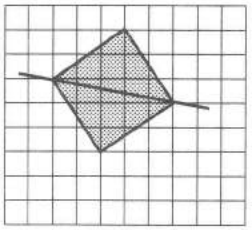
2.



3.



4.

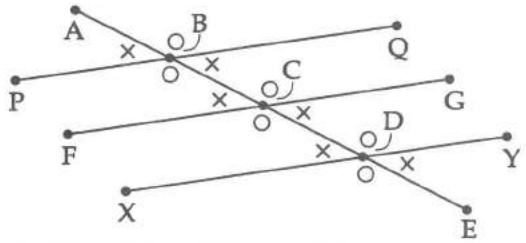


13.3 Constructing Perpendiculars

7. c) square

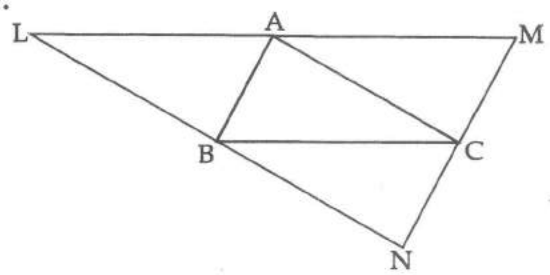
13.4 Constructing Parallel Lines

6.



c) ∠ABP, ∠BCF, ∠CDX, ∠EDY, ∠CBQ
d) ∠ABQ, ∠PBC, ∠BCG, ∠XDE, ∠CDY

7.



a) ΔLAB, ΔABC, ΔAMC, ΔBNC, ΔLMN
b) ABNC, ABCM, LBCA c) ABNC, ABCM, LBCA

Test Two Chapter 13: Geometric Constructions

5. b) ∠ABC = 117°, ∠XBA = 40°, ∠YBC = 23°
8. b) ∠DEF = 35°, ∠EFD = 35°, ∠FDE = 110°

Extension Chapter 13: Geometric Constructions

1. c) In ΔDEF, which is scalene, the perpendicular bisector of EF and the bisector of ∠D are the same.
3. The sizes of the interior angles are different.
4. b) ∠A = ∠C, ∠D = ∠B
c) ∠A and ∠D, ∠C and ∠B, ∠A and ∠B, ∠C and ∠D