CHAPTER 7

Practice Test

Strand	NSN	MEA	GSS	PA	DMP
Questions	1–19			5, 13, 18	

Multiple Choice

For questions 1 to 5, choose the best answer.

1. The number 5^2 is expressed

A in standard form
B as a repeated multiplication
C in factored form
D in exponential form

2. The number 6^3 means

A 6×3
B $3 \times 3 \times 3 \times 3 \times 3 \times 3$
C $6 \times 6 \times 6$
D both B and C

3. A square has an area of 10 cm^2. Its side length is

A 100 cm
B between 3 cm and 4 cm
C over 1 cm
D between 2 cm and 5 cm

4. Which number is not a perfect square?

A 25
B 169
C 114
D 400

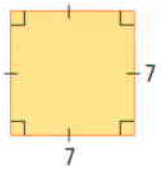
5. The first four numbers in a pattern are 1, 8, 27, and 64. The next number in the pattern is

A 125
B 128
C 216
D 192

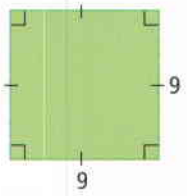
Short Answer

6. Find the area of each square.

a)

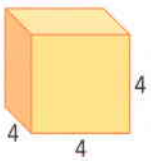


b)

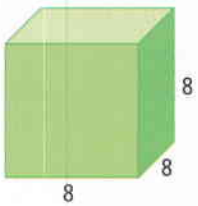


7. Find the volume of each cube.

a)



b)



8. Evaluate.

a) 5^2 **b)** 10^2
c) 6^3 **d)** 7^3

9. Evaluate.

a) $\sqrt{64}$ **b)** $\sqrt{400}$
c) $\sqrt{1.44}$ **d)** $\sqrt{2.25}$

10. Decide if each number is a perfect square. Show how you know.

a) 121 **b)** 47

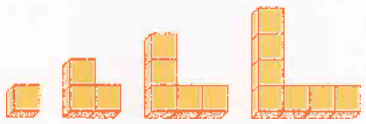
11. Write as a repeated multiplication. Then, evaluate.

a) 2^9 **b)** 3^6 **c)** 4^5

12. Write the following expressions in order from the least value to the greatest value. Show your reasoning.

$3 \times 3 \times 3 \times 3$ 10^2 $\sqrt{6400}$ 2^6 79.5

13. The diagrams show the first four shapes in a pattern. Each cube has an edge length of 2 cm. What is the volume of the 5th shape?



14. A square photograph has an area of 361 cm^2. Will it fit inside a 30 cm by 18 cm rectangular frame? Explain.

15. a) Norah said, "2^6 is greater than 2^5, because 6 is greater than 5." Do you agree? Explain.

b) Paul said, "1^6 is greater than 1^5, because 6 is greater than 5." Do you agree? Explain.

16. Express the number of pennies in $100 as a power of 100.

17. A 4 m by 3 m rectangular floor is covered by 300 square floor tiles. What is the side length of each tile?

18. a) Evaluate 9^2, 99^2, 999^2, and 9999^2.

b) Predict the values of $99\,999^2$ and $999\,999^2$.

Extended Response

19. Describe how you would solve one of the following problems. In your description, list the missing information you would need and the assumptions you would make.

a) How many years would it take to walk the distance from Earth to the Moon?

b) How many cell phones would fill a backpack?

c) How many litres of soft drinks do the students in your school drink in a year?

Chapter Problem Wrap-Up

In question 22, on page 222, you solved a problem involving algae on a pond. The following questions refer to three different bodies of water. Each one is polluted. In each case, the area of the algae doubles every week.

1. The area of the algae on a lake is 5 m^2. What will the area of the algae be after 4 weeks?

2. Algae covered an area of 2 m^2 in a square water-storage tank. Three weeks later the tank was completely covered. What was the side length of the tank?

3. It took 6 weeks for a pond to be completely covered by algae. What percent of the pond was covered after 4 weeks? Explain and justify your solution.

Chapter 7

1. **Answer: D**
2. **Answer: C**
3. **Answer: B**
4. **Answer: C**
5. **Answer: A**
6. **Ans:**
    a. A = 7x7 = 49
    b. A = 9x9 = 81
7. **Ans:**
    a. V = 4x4x4 = 64
    b. V = 8x8x8 = 512
8. **Ans:**
    a. 5x5 = 25
    b. 10x10 = 100
    c. 6x6x6 = 216
    d. 7x7x7 = 343
9. **Ans:**
    a. $\sqrt{64} =$**8**
    b. $\sqrt{400} =$**20**
    c. $\sqrt{1.44} =$**1.2**
    d. $\sqrt{2.25} =$**1.5**
10. **Ans:**
    a. Yes, 11x11 OR 11² = 121 OR $\sqrt{121} = 11$
    b. No, the square root leaves us with a decimal, therefore it is not a perfect square
11. **Ans:**
    a. 2x2x2x2x2x2x2x2x2 = 512
    b. 3x3x3x3x3x3 = 729
    c. 4x4x4x4x4 = 1024
12. Least → greatest: $2^6 = 64 < 79.5 = 79.5 < \sqrt{6400} = 80 < 3\times3\times3\times3 = 81 < 10^2 = 100$
13. The 5th shape will have 9 cubes; each cube is $2^3=8cm^3$, so total volume = 9 cubes × $8cm^3$ = 9x8 = 72 cm^3
14. Area 361 cm^2 → square side = $\sqrt{361} = 19$. The frame is 30 cm by 18 cm, and **19 > 18**, so **No, it won't fit**

Chapter 7 Continued

15. **Ans:**
    a. **Yes**, $2^6 > 2^5$ Norah's reason is correct the greater the exponent the greater the value if the base is the same.
    b. **No**, $1^6=1^5$ Paul is wrong because 1 is the exception to the rule above, 1 to any power is 1.
16. $100 = 100x100 = 10,000 pennies = **100^2** therefore, $100 = 10,000 pennies
17. Floor area $4\times3=12m^2$ OR $1200cm^2$. Each tile area $=12/300=0.04m^2$ OR $1200/30 = 400cm^2$. Side length $=\sqrt{.4}=0.2m$ OR $\sqrt{400}= 20cm$ **Answer: 20 cm**
18. **Ans:**
    a. $9^2=81$, $99^2 = 9801$, $999^2=998001$, $9999^2 = 99980001$
    99992=999800019999^2=9998000199992=99980001
    b. $99\,999^2 = 9\,999\,800\,001$, $999999^2 = 999,998,000,001$
19. **Ans:**
    a. **Earth to Moon walking time:**
    Need: distance Earth→Moon, walking speed, hours walked per day.
    Do: Time = distance / speed per day, then convert days → years.
    b. **Phones to fill a backpack:**
    Need: backpack volume & phone volume,
    Do: Backpack volume/phone volume = # of phones
    c. **Litres of soft drink in a year:**
    Need: number of students, average drinks per student per day/week, school days per year, average drink size in litres.
    Do: total L=(students)×(drinks/student/day)×(days)×(L/drink)