**Ch 7 Exponents Practice Test**

**True/False**

*Indicate whether the sentence or statement is true or false.*

*If false, write the corrected statement in the space provided.*

\_\_\_\_ 1. The volume of a cube with a side length of 10 is 100.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_ 2. 123 < 242

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\_\_\_\_ 3. A square parking lot with a side length of 0.25 km has an area of 6.25 km2.

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\_\_\_\_ 4. The number 181 is a perfect square.

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\_\_\_\_ 5. The exponent of 74 is 4.

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\_\_\_\_ 6. 8  8  8  8  8 = 58

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\_\_\_\_ 7. The exponent of a power is always greater than the base.

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\_\_\_\_ 8. The base of 23 is 8, since 23 = 8.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_ 9. 82 = 43 = 26

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_ 10. The value of a power increases with its exponent, if the base of the power is greater than 1.

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\_\_\_\_ 11. 3  3  3  3  3  3 < 63

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_ 12.  = 25

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_ 13. A power is a number in exponential form and includes a base, an exponent, and a multiplication sign.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Multiple Choice**

*Identify the letter of the choice that best completes the statement or answers the question.*

\_\_\_\_ 14. What is the area of a square with a side length of 8 units?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 32 units | c. | 64 units |
| b. | 32 square units | d. | 64 square units |

\_\_\_\_ 15. Write 1  1  1  1 in exponential form.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 14 | c. | 1 |
| b. | 41 | d. | 4 |

\_\_\_\_ 16. What is the value of ?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 32 | c. | 256 |
| b. | 128 | d. | 512 |

\_\_\_\_ 17. Which of these numbers is NOT a perfect square: 36, 121, 361, or 426?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 36 | c. | 361 |
| b. | 121 | d. | 426 |

\_\_\_\_ 18. What is the side length of a square with an area of 196 m2?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 14 m | c. | 49 m |
| b. | 24 m | d. | 98 m |

\_\_\_\_ 19. What is the side length of a square with an area of 2.56 cm2?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 0.16 cm | c. | 0.064 cm |
| b. | 1.6 cm | d. | 0.64 cm |

\_\_\_\_ 20. What is another way of writing 73?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 37 | c. | 7  7  7 |
| b. | 7  3 | d. | 3  3  3  3  3  3  3 |

\_\_\_\_ 21. In the expression 59, what is the number 5?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | base | c. | exponent |
| b. | power | d. | multiplying factor |

\_\_\_\_ 22. In the set of numbers 322, 46, 54, and 210, which number has the greatest value?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 210 | c. | 54 |
| b. | 46 | d. | 322 |

\_\_\_\_ 23. In the set of numbers , 92, 76, and 1100, which number has the greatest value?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 1100 | c. | 76 |
| b. | 92 | d. |  |

**Matching**

*Match the correct term to each of the following descriptions.*

|  |  |  |  |
| --- | --- | --- | --- |
| a. | base | d. | perfect square |
| b. | power | e. | Fermi problem |
| c. | exponent |

\_\_\_\_ 24. a number whose square root is a natural number

\_\_\_\_ 25. the number that you multiply in a power

\_\_\_\_ 26. the number of factors you multiply in a power

**Short Answer**

*Write your answer in the space provided.*

27. Write each of the following as a repeated multiplication.

a) 32

b) 153

c) 452

d) 113

28. Use a calculator to evaluate.

a) 73

b) 92

c) 123

29. Fill in the blank with <, =, or > to make each statement true.

a) 33 \_\_\_ 52

b) 112 \_\_\_ 53

c) 43 \_\_\_ 82

d) 63 \_\_\_ 152

30. Using a calculator, find the area of a square with each side length.

a) 18 m

b) 29 cm

c) 2.5 mm

31. Using a calculator, find the volume of a cube with each edge length.

a) 13 units

b) 17 mm

c) 25 cm

32. Find the side length of a square with the given area.

a) 144 00 mm2

b) 625 cm2

c) 0.25 m2

d) 0.49 square units

33. Write each expression as a power, and use a calculator to evaluate.

a) 0.3  0.3

b) 2.1  2.1  2.1

c) 0.8  0.8  0.8  0.8

d) 5.5  5.5

34. Order the following numbers from least to greatest.

63, 152, 74, 19, 46

35. Write each number as a power of 0.2.

a) 0.0016

b) 0.008

c) 0.04

36. Fill in the blank with <, =, or > to make each statement true.

a) 32 \_\_\_ 

b)  \_\_\_ 55

c) 142 \_\_\_ 169

d) 12 \_\_\_ 

37. Order the following numbers from least to greatest.

, 33, 30, , 25

38. Find the values of *x* and *y* in the following expressions.

a) 65 = *x*

b) *y*9 = 512

c) 1.2*x* = 1.728

d) 5*x* = *y*2 = 625

39. List the steps you would take to estimate how many textbooks are needed to cover the gym floor.

**Problem**

*Write your answer in the space provided.*

40. Rupert has a square desk in his bedroom that takes up an area of 10 000 cm2. The area of Rupert’s bedroom is four times the area of the desk. What is the side length of the square bedroom?

**Ch 7 Exponents Practice Test**

**Answer Section**

**TRUE/FALSE**

1. ANS: F

The volume of a cube with a side length of 10 is 1000.

DIF: Level 1 REF: Knowledge/Understanding OBJ: Section 7.1

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Volume of a Cube

2. ANS: F

123 > 242

Rationale:

123 = 1728, 242 = 576

1728 > 576

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.1

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

3. ANS: F

A square parking lot with a side length of 0.25 km has an area of 0.0625 km2.

Rationale:

0.25  0.25 = 0.0625

DIF: Level 3 REF: Application OBJ: Section 7.1 STO: NSN-7m4

TOP: Number Sense and Numeration KEY: Area of a Square

4. ANS: F

The number 181 is not a perfect square. It does not have a natural number as its square root.

Rationale:

181 is between 169 and 196, the square root of 181 is between 13 and 14. The square root of 181 is not a natural number.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.2

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Perfect Square

5. ANS: T DIF: Level 1 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Power

6. ANS: F

8  8  8  8  8 = 85

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Exponent

7. ANS: F

The exponent of a power can be greater or smaller than the base.

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Power

8. ANS: F

The base of 23 is 2.

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Power

9. ANS: T DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m1 TOP: Number Sense and Numeration

KEY: Comparing Numbers

10. ANS: T DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Power

11. ANS: F

3  3  3  3  3  3 > 63

Rationale:

3  3  3  3  3  3 = 729, 63 = 216

729 > 216

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

12. ANS: T DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m1 TOP: Number Sense and Numeration

KEY: Comparing Numbers

13. ANS: F

A power is a number in exponential form and includes a base and an exponent.

DIF: Level 4 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Power

**MULTIPLE CHOICE**

14. ANS: D DIF: Level 1 REF: Knowledge/Understanding

OBJ: Section 7.1 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Area of a Square

15. ANS: A DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.1 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Exponent

16. ANS: A DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.2 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Square Root

17. ANS: D DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.2 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Perfect Square

18. ANS: A

Length of each side =  = 14

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.2

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Square Root

19. ANS: B

Length of each side =  = 1.6

DIF: Level 4 REF: Knowledge/Understanding OBJ: Section 7.2

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Square Root

20. ANS: C DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Exponent

21. ANS: A DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Power

22. ANS: B DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m1 TOP: Number Sense and Numeration

KEY: Comparing Numbers

23. ANS: B DIF: Level 3 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m1 TOP: Number Sense and Numeration

KEY: Comparing Numbers

**MATCHING**

24. ANS: D DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.2 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Perfect Square

25. ANS: A DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Base

26. ANS: C DIF: Level 2 REF: Knowledge/Understanding

OBJ: Section 7.3 STO: NSN-7m4 TOP: Number Sense and Numeration

KEY: Exponent

**SHORT ANSWER**

27. ANS:

a) 3  3

b) 15  15  15

c) 45  45

d) 11  11  11

DIF: Level 2 REF: Knowledge/Understanding OBJ: Section 7.1

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Exponent

28. ANS:

a) 73 = 343

b) 92 = 81

c) 123 = 1728

DIF: Level 2 REF: Application OBJ: Section 7.1 STO: NSN-7m4

TOP: Number Sense and Numeration KEY: Exponent

29. ANS:

a) 33 > 52

b) 112 < 53

c) 43 = 82

d) 63 < 152

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.1

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

30. ANS:

Use the formula *A* = *s*2.

a) *A* = 182

*A* = 324

The area is 324 m2.

b) *A* = 182

*A* = 841

The area is 841 cm2.

c) *A* = 2.52

*A* = 6.25

The area is 6.25 mm2.

DIF: Level 3 REF: Application OBJ: Section 7.1 STO: NSN-7m4

TOP: Number Sense and Numeration KEY: Area of a Square

31. ANS:

Use the formula *V* = *l*3.

a) *V* = *l*3

*V* = 133

*V* = 2197

The volume is 2197 cubic units.

b) *V* = *l*3

*V* = 173

*V* = 4913

The volume is 4913 mm3.

c) *V* = *l*3

*V* = 253

*V* = 15 625

The volume is 15 625 cm3.

DIF: Level 3 REF: Application OBJ: Section 7.1 STO: NSN-7m4

TOP: Number Sense and Numeration KEY: Volume of a Cube

32. ANS:

a)  = 120

The length of each side is 120 mm.

b)  = 25

The length of each side is 25 cm.

c)  = 0.5

The length of each side is 0.5 m.

d)  = 0.7 units

The length of each side is 0.7 units.

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.2

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Square Root

33. ANS:

a) 0.32 = 0.09

b) 2.13 = 9.261

c) 0.84 = 0.4096

d) 5.52 = 30.25

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Exponent

34. ANS:

63 = 216

152 = 225

74 = 2401

19 = 1

46 = 4096

The numbers from least to greatest are

19 < 63 < 152 < 74 < 46

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

35. ANS:

a) 0.24

b) 0.23

c) 0.22

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Exponent

36. ANS:

a) 32 = 

b)  > 55

c) 142 > 169

d) 12 = 

DIF: Level 3 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

37. ANS:

 = 13

33 = 27

 = 26

25 = 32

The numbers from least to greatest are

 <  < 33 < 30 < 25

DIF: Level 4 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m1 TOP: Number Sense and Numeration KEY: Comparing Numbers

38. ANS:

a) *x* = 7776

b) *y* = 2

c) *x* = 3

d) *x* = 4, *y* = 25

DIF: Level 4 REF: Knowledge/Understanding OBJ: Section 7.3

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Exponent

39. ANS:

Responses will vary, but should include the following key steps:

1) Find the area of the textbook.

2) Estimate the area of the gym floor.

3) Divide the area of the gym floor by the area of the textbook.

DIF: Level 3 REF: Communication OBJ: Section 7.4

STO: NSN-7m5 TOP: Number Sense and Numeration KEY: Fermi Problem

**PROBLEM**

40. ANS:

Area of bedroom = 4  Area of desk = 40 000 cm2

Side length of bedroom =  = 200

The side length of the square bedroom is 200 cm.

DIF: Level 3 REF: Thinking/Inquiry/Problem Solving OBJ: Section 7.2

STO: NSN-7m4 TOP: Number Sense and Numeration KEY: Area of a Square