

## Spring Break Homework

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Simplify the expression below.

$$5^2 - 2^3$$

- A. 2      B. 4      C. 17      D. 19

2. Phillip writes the expression  $2^7$ . Which is another way to write the same expression using repeated multiplication?

- A.  $2 \times 7$   
B.  $7 \times 7$   
C.  $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$   
D.  $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$

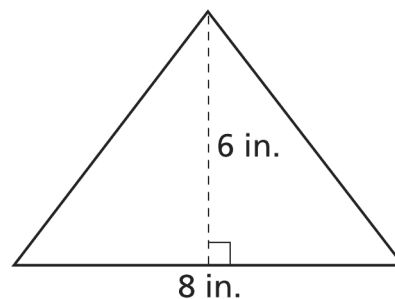
3. Mr. Bryant writes the expression below.

$$9^2 \div 3(n)$$

What is the value of the expression when  $n = 3$ ?

- A. 27      B. 9      C. 3      D. 2

4. Willard has a stained glass window with one triangular piece, as shown below.



[not drawn to scale]

$$A = \frac{1}{2}bh$$

What is the area, in square inches, of the triangular piece?

- A. 14      B. 24      C. 48      D. 96

5. Simplify the expression below.

$$6 \times 4 \div 2 + 3^3$$

6. Simplify the expression below.

$$(6 + 3^2) \times 4$$

- A. 36      B. 42      C. 48      D. 60

7. Simplify the expression below.

$$3^3 + 1^2$$

- A. 10    B. 11    C. 28    D. 29

8. Simplify the expression below.

$$4^3 \times 3^2$$

- A. 35    B. 72    C. 384    D. 576

9. Simplify the expression below.

$$6 \times (5^3 + 2)$$

- A. 762    B. 752    C. 102    D. 92

10. Mr. Simpson has 5 boxes of paintbrushes in his art room. After the first week of school, he buys 3 more paintbrushes. The expression below shows the total number of paintbrushes in Mr. Simpson's art room when  $p$  represents the number of brushes in each box.

$$3 + p \times 5$$

If each box contains 8 paintbrushes, how many total paintbrushes are in Mr. Simpson's art room?

- A. 18    B. 28    C. 43    D. 55

11. Mr. Cohen wrote the expression below for his 3 cousins to use to find his age.

$$n^2 \times 7 - 3$$

If  $n$  represents the number of cousins, what is Mr. Cohen's age?

- A. 12    B. 18    C. 36    D. 60

12. Which exponential expression is equivalent to  $8 \times 8 \times 8 \times 8$ ?

- A.  $4^4$     B.  $4^8$     C.  $8^4$     D.  $8^8$

13. Simplify the expression below.

$$4^2 + 5^2$$

- A. 13    B. 18    C. 23    D. 41

14. What is the expanded form of  $9^3$ ?

- A.  $9 \times 3$                       B.  $9 + 3$   
C.  $9 + 9 + 9$                 D.  $9 \times 9 \times 9$

15. Simplify the expression below.

$$3 + 5 \times 2^3 + 3^2$$

- A. 39    B. 52    C. 73    D. 88

16. What is the value of the expression below when  $r = 2$ ?

$$9 - 3r$$

- A. 0    B. 3    C. 6    D. 12

17. Ms. Elma writes the expression below.

$$3 \times 3 \times 3 \times 3 \times 3 \times 3$$

She asks her sixth-grade students to rewrite the expression in exponential form. Marjorie writes the expression below.

$$6^3$$

Explain why Marjorie's answer is incorrect.

Be sure to correctly rewrite Ms. Elma's expression in exponential form.

18. Which pair of expressions is equivalent to each other?

- A.  $2 \times 2 \times 2$  and  $3^2$   
B.  $6 \times 6 \times 6 \times 6$  and  $4^6$   
C.  $4 \times 4 \times 4 \times 4 \times 4$  and  $4^5$   
D.  $8 \times 8 \times 8 \times 8 \times 8 \times 8$  and  $8^8$

19. Simplify the expression below.

$$7^2 - 9 + 1^3$$

- A. 37    B. 39    C. 41    D. 43

20. Simplify the expression below.

$$4^3 \div 2^2$$

- A. 2    B. 3    C. 16    D. 32

21. Which proportion is correct?

- A.  $\frac{4}{10} = \frac{3}{6}$                       B.  $\frac{1}{2} = \frac{7}{8}$   
C.  $\frac{1}{2} = \frac{3}{6}$                       D.  $\frac{4}{10} = \frac{7}{8}$

22. Evaluate:

$$6^3 + 7 \times 4$$

- A. 100    B. 244    C. 757    D. 892

23. Which pair of expressions is equivalent?

- A.  $4(6x)$  and  $10x$     B.  $4(6x)$  and  $24x$   
C.  $4x + 6x$  and  $10x^2$     D.  $4x + 6x$  and  $24x$

24. Which pair of expressions below is equivalent?

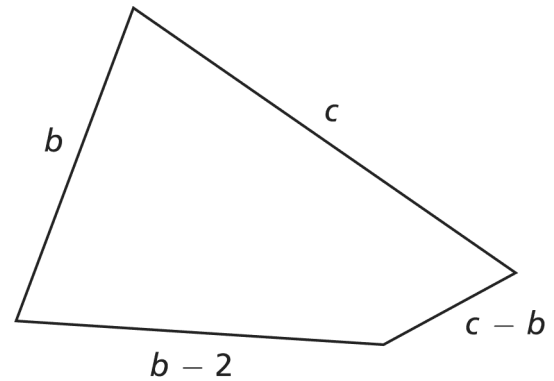
- A.  $x + y + x + y$  and  $2(x + y)$   
B.  $5(2x - 3y)$  and  $10x - 3y$   
C.  $4x - 5y$  and  $5y - 4x$   
D.  $9x + 2y$  and  $11xy$

25. Which expression represents the phrase below?

8 less than the product of 6 and a number,  $x$

- A.  $8 - 6x$     B.  $6x - 8$   
C.  $(6 + x) - 8$     D.  $8 - (6 + x)$

26. In the diagram of a quadrilateral below, the variables represent the lengths of the sides, in inches.



[not drawn to scale]

Write an expression using the variables  $b$  and  $c$  that could be used to find the perimeter of the quadrilateral.

If  $b = 11$  and  $c = 16$  what is the perimeter of the quadrilateral?

27. What is the value of the expression below?

$$3^4 + 9$$

- A. 21    B. 39    C. 43    D. 90

28. What is the value of the expression below when  $c = 5$  and  $d = 4$ ?

$$6c^2 - 5d + 8$$

- A. 48    B. 79    C. 138    D. 888

29. Which expression is equivalent to  $16a + 24b$ ?

- A.  $4(4a + 20b)$       B.  $8(2a + 3b)$   
C.  $4a(4 + 6b)$       D.  $8ab(2 + 3)$

30. Which expression is equivalent to  $3(6m) + m$ ?

- A.  $19m$       B.  $21m$   
C.  $7m + 3$       D.  $18m + 6m^2$

31. What is the value of the expression below when  $z = 7$ ?

$$3z - 3$$

- A. 12      B. 18      C. 21      D. 34

32. Which equation is true when  $n = 4$ ?

- A.  $2n = 6$       B.  $n + 3 = 7$   
C.  $9 - n = 13$       D.  $\frac{n}{12} = 3$

33. Which expression is equivalent to  $5(d + 1)$ ?

- A.  $5d + 5$       B.  $5d + 1$   
C.  $d + 5$       D.  $d + 6$

34. Which expression is equivalent to  $8x - 2y + x + x$ ?

- A.  $4x$       B.  $8x$   
C.  $6x - 2y$       D.  $10x - 2y$

35. Which two expressions are equivalent for any value of  $y$ ?

- A.  $3(3y + 3)$  and  $6y + 6$   
B.  $3(3y + 3)$  and  $9y + 6$   
C.  $9(y + 3)$  and  $12 + 9y$   
D.  $9(y + 3)$  and  $27 + 9y$

36. Which equation has the solution  $x = 2$ ?

- A.  $2x - 3 = 19$       B.  $3x + 2 = 8$   
C.  $4x - 4 = -4$       D.  $5x + 1 = 10$

37. Which expression is equivalent to the expression below?

$$g + g + g + g + g + g$$

- A.  $6 + g$    B.  $g^6$    C.  $6g$    D.  $\frac{g}{6}$

38. Find the value of the expression.

$$24\frac{3}{5} + 4^3 \times (8\frac{1}{5} - 2)$$

39. Which pair of expressions below are equivalent?

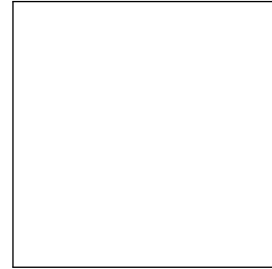
- A.  $7(2x)$  and  $9x$   
B.  $3x + 5x$  and  $15x$   
C.  $4(2x - 6)$  and  $8x - 24$   
D.  $x + x + x + x$  and  $x^4$

40. What is the value of the expression below?

$$2[3(4^2 + 1)] - 2^3$$

- A. 156   B. 110   C. 94   D. 48

41. A square with one side length represented by an expression is shown below.



$$6(3x + 8) + 32 + 12x$$

Use the properties of operations to write three different equivalent expressions to represent the lengths of the other three sides of the square. One of your expressions should contain only two terms.

42. Which expression is equivalent to  $5(6x + 3y)$ ?

- A.  $11x + 3y$                       B.  $11x + 8y$   
C.  $30x + 3y$                       D.  $30x + 15y$

43. Which pair of expressions is equivalent for any variable value greater than zero?

- A.  $3(x + 2)$  and  $3x + 2$   
B.  $4d + 2e$  and  $8d + e$   
C.  $f + f + f + g$  and  $3fg$   
D.  $b + b + 3c$  and  $2b + 3c$

44. The surface area,  $S$ , of a right rectangular prism with length  $l$ , width  $w$ , and height  $h$  can be found using the formula below.

$$S = 2(lw + wh + hl)$$

What is the surface area, in square inches, of a prism with a length of 12 inches, a width of 9 inches, and a height of 2 inches?

- A. 300    B. 258    C. 150    D. 92

45. The two expressions below are equivalent.

$$\begin{aligned} y(2.5 + 7) + y - 2 \\ 10.5y - 2 \end{aligned}$$

Which statement *best* explains why the expressions are equivalent?

- A. The expressions have the same value for any value of  $y$ .
- B. The expressions have the same value for only whole number values of  $y$ .
- C. The expressions have the same value only when  $y$  is an odd number.
- D. The expressions have the same value only when  $y$  is an even number.

46. The formula below is used to convert a temperature in degrees Celsius,  $C$ , to a temperature in degrees Fahrenheit,  $F$ .

$$F = 1.8C + 32$$

The high temperature in a mountain city was  $15^\circ\text{C}$ . What was the high temperature in degrees Fahrenheit?

47. An equation is shown below.

$$12 - 9 + c = 12$$

What value of  $c$  makes the equation true?

- A. 0    B. 3    C. 9    D. 12

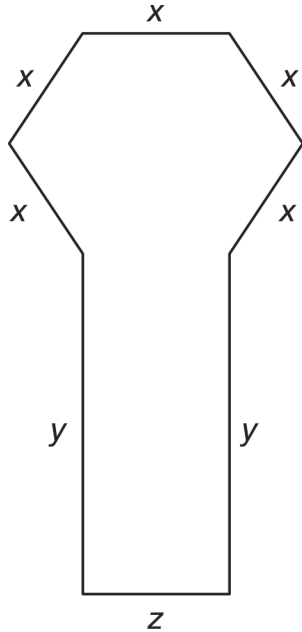
48. Which expression is equivalent to  $5(4x + 3) - 2x$ ?

- A.  $18x + 15$     B.  $18x + 3$
- C.  $7x + 8$     D.  $2x + 8$

49. Which two expressions are equivalent?

- A.  $x + x + x$  and  $x^3$
- B.  $14x + 10 - 2x$  and  $16x + 10$
- C.  $12x + 16x$  and  $4(3x + 4x)$
- D.  $12x^2 + 5x + 10$  and  $17x^2 + 10$

50. Which expression represents the perimeter of the figure below?



- A.  $5x + 2y$   
 B.  $x + y + z$   
 C.  $5x + 2y + z$   
 D.  $(5 + 2 + 1)(x + y + z)$

51. Which expression is equivalent to  $60 - 3y - 9$ ?

- A.  $3(17 - y)$       B.  $3(20 - y) - 3$   
 C.  $17(3 - y)$       D.  $20(3 - 3y) - 9$

52. What is the value of the expression  $\frac{3^2 \cdot (2^3 + 4)}{2^2}$ ?

- A. 10      B. 15      C. 19      D. 27

53. The volume,  $V$ , of any cube with a side length,  $s$ , can be determined using the formula  $V = s^3$ . What is the volume, in cubic centimeters, of a cube with a side length of 2.3 centimeters?

- A. 5.29      B. 6.9      C. 8.027      D. 12.167

54. Which expression is equivalent to  $9(9m + 3t)$ ?

- A.  $18m + 3t$       B.  $81m + 3t$   
 C.  $18m + 12t$       D.  $81m + 27t$

55. Which expression represents the phrase below?

3 fewer than a number,  $p$

- A.  $3 - p$       B.  $p \div 3$       C.  $3 \div p$       D.  $p - 3$



56. Select each expression that is equivalent to  $3(n + 6)$ .

Select *all* that apply.

- $3n + 6$   
  $3n + 18$   
  $2n + 2 + n + 4$   
  $2(n + 6) + (n + 6)$   
  $2(n + 6) + n$

57. Which equations with exponential expressions are true?

Select *all* that apply.

- $3^3 = 3 \cdot 3$   
  $5^2 = 5 \cdot 5$   
  $5^4 = 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4$   
  $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 6^7$   
  $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^6$   
  $7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^7$

58. What is the value of  $a^2 + 3b \div c - 2d$ , when  $a = 3$ ,  $b = 8$ ,  $c = 2$ , and  $d = 5$ ?

59. Here is an expression.

$$\left(\frac{3}{4}\right)^3$$

What is the value of this expression?

- A.  $\frac{9}{64}$       B.  $\frac{27}{64}$       C.  $\frac{9}{4}$       D.  $\frac{27}{4}$

60. Which expression is equivalent to  $4 \times 4 \times 4 \times 5 \times 5$ ?

- A.  $3^4 \times 2^5$                       B.  $4^3 \times 5^2$   
C.  $4^4 \times 5^5$                       D.  $12^3 \times 10^2$

61. What is the value of  $x^4 + 0.5y^3$  when  $x = 2$  and  $y = 4$ ?

62. Which expression is equivalent to  $24 + 30$ ?

- A.  $6(4 + 5)$                       B.  $6(4 + 6)$   
C.  $8(3 + 4)$                       D.  $8(3 + 12)$

63. Select the expression that is equivalent to  $48 + 12$ .

- A.  $6(8 + 6)$                       B.  $12(4 + 1)$   
C.  $4(44 + 3)$                     D.  $8(6 + 4)$

64. An expression is shown.

$$12 \cdot 12 \cdot 12 \cdot 12 + 7(3 \cdot 3 \cdot 3 \cdot 3 + 3)$$

Which of the following shows this expression written using exponents?

- A.  $4^{12} + 7(5^3)$                     B.  $4^{12} + 7(4^3 + 3)$   
C.  $12^4 + 7(3^5)$                     D.  $12^4 + 7(3^4 + 3)$

65. The variable  $x$  represents a value in the set  $\{4, 6, 7, 8\}$ . Which value of  $x$  makes  $2(x - 4) + 3 = 7$  a true statement?

- A. 4            B. 6            C. 7            D. 8

66. Which of the following terms describes the 5 in the expression  $5x - 3y + 2z + 1$ ?

- A. Coefficient                      B. Constant  
C. Term                                D. Variable

67. What is the value of the expression  $5ab - 2c$ , where  $a = 2$ ,  $b = 3$ , and  $c = 0$ ?

- A. 8            B. 28            C. 30            D. 503

68. What is the value of  $F$  in the formula  $F = \frac{9}{5}C + 32$  when  $C = 30$ ?

- A. 302            B. 86            C. 62            D. 54

69. Which of the following is equivalent to the expression  $2x + 3x + 4(x - 2)$ ?

- A.  $9x - 2$     B.  $9x - 8$     C.  $5x - 2$     D.  $5x - 8$

70. Which of the following expressions is equivalent to the expression  $d + d + d + d$ ?

- A.  $4 + d$                               B.  $4d$   
C.  $d^2 + d^2$                         D.  $d^4$