Expressions and Equations

Domain 3: Diagnostic Assessment for Lessons 17–23

Domain 3: Cumulative Assessment for Lessons 17–23

Domain 3: Diagnostic Assessment for Lessons 17–23

1. Which expression represents "the product of 8 squared and the difference of a number n and 9"?

   A. $8^2 \times (n - 9)$

   B. $8^2 \times (n + 9)$

   C. $8^2 + 9n$

   D. $8^2 - 9n$

2. What is the value of the expression below when $a = 4$?

   $$6a + 7$$

   A. 31

   B. 41

   C. 53

   D. 71

3. Which expression is equivalent to $9(4 + r)$?

   A. $36r$

   B. $36 + r$

   C. $13r$

   D. $36 + 9r$

4. Which number is a solution for the inequality below?

   $$5x \leq 20$$

   A. 90

   B. 20

   C. 10

   D. 0

5. Franklin paid $152 for 8 DVDs. Each DVD was the same price. Which shows the equation that represents the situation and the price of each DVD?

   A. $\frac{d}{8} = 152$; $1,216

   B. $d - 8 = 152$; $160

   C. $d + 8 = 152$; $144

   D. $8d = 152$; $19

6. Which equation best represents the relationship between x and y shown in the table?

x	0	1	2	3
y	1	4	7	10

   A. $y = x + 1$

   B. $y = 3x + 1$

   C. $y = 4x$

   D. $y = 5x - 1$

7. Josephine bought a CD that cost $18. She handed the clerk d dollars. She received more than $30 in change. Which inequality best represents d, the number of dollars she handed the clerk?

   A. $d > 30$

   B. $d \geq 30$

   C. $d > 48$

   D. $d \geq 48$

8. What is the value of k in the following equation?

$$\tfrac{1}{4}k = 8$$

A. 2

B. 16

C. 32

D. 64

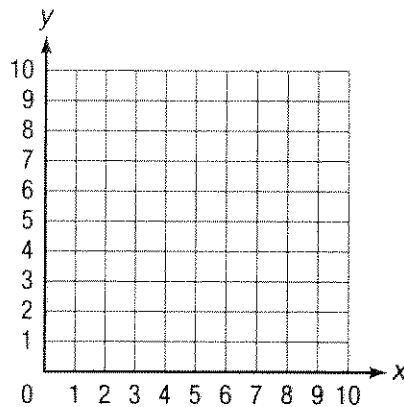**9.** Describe the expression $15 + (12 \div n)$ in words.

_____

_____

10. The equation $y = x - 2$ describes how the variables x and y are related.

A. Complete the table of values below for $y = x - 2$. Show all your work.

x	$y = x - 2$	y	(x, y)
2			
4			
6			
8			

B. Graph $y = x - 2$ on the coordinate grid below.

Lesson Practice

Choose the correct answer.

1. Which expression represents "the product of a number g and 8"?

   A. $g + 8$

   B. $g - 8$

   C. $8g$

   D. $8 \div g$

2. Which expression represents "half the sum of 5 and a number b"?

   A. $\dfrac{b + 5}{2}$

   B. $2b + 5$

   C. $\dfrac{b}{2 + 5}$

   D. $\dfrac{b}{2} + 5$

3. Bianca puts $10 in a savings account each month and an extra $20 when she receives money for her birthday. If her birthday was this week, which expression represents the amount she has saved this year?

   A. $20m + 10$

   B. $20m - 10$

   C. $10m - 20$

   D. $10m + 20$

4. Marion is 3 years more than 5 times as old as Paula. If p represents Paula's age, which expression represents Marion's age?

   A. $3p + 5$

   B. $3p - 5$

   C. $5p + 3$

   D. $5p - 3$

5. Which expression represents "add 7 and a number n, then multiply by 8 cubed"?

   A. $8^3 \times (7 + n)$

   B. $8^3 + 7n$

   C. $8^3 + 7 + n$

   D. $8^3 \times 7n$

6. Oscar bought n ride tickets at the carnival. Esther bought 4 times as many ride tickets as Oscar. Which expression represents the total number of ride tickets that Oscar and Esther bought?

   A. $4n + 4n$

   B. $n + 4n$

   C. $n + 4$

   D. $4n$

7. Which expression represents "9 less than the product of 5 and a number n"?

   A. $9 - (5 + n)$

   B. $9 - 5n$

   C. $(5 + n) - 9$

   D. $5n - 9$

8. Which expression represents "the sum of 16 squared and the quotient of 8 and a number b?

   A. $16^2 + \frac{8}{b}$

   B. $16^2 + 8b$

   C. $(16 + 8)^2 \div b$

   D. $(16 + 8 \div b)^2$

9. Use "the product of 6 and the sum of 3 times a number n and 5" to answer the questions below.

   A. Write an expression that represents the statement.

   _____

   B. Explain how you decided what operation symbols to use in your expression.

   _____

   _____

   _____

Lesson Practice

Choose the correct answer.

1. What is the value of the expression below?

$$20 + 8 - 4^2$$

A. 12
B. 24
C. 28
D. 44

2. What is the value of the expression below?

$$6 \div 2 - 1$$

A. 6
B. 5
C. 3
D. 2

3. What is the value of the expression below when $a = 2$ and $b = 4$?

$$3a + b$$

A. 9
B. 10
C. 18
D. 24

4. What is the value of the expression below when $k = 4$?

$$18 - k^2$$

A. 2
B. 8
C. 16
D. 128

5. What is the value of the expression below when $m = 9$ and $n = 3$?

$$m^2 \div (n + 6)$$

A. 84
B. 33
C. 15
D. 9

6. What is the value of the expression below when $x = 6$ and $y = 2$?

$$xy - y^3$$

A. 4
B. 15
C. 54
D. 1,000

7. What is the area of a square with a side length of 11 inches? Use the formula $A = s^2$, where s is the side length of the square.

    A.   22 square inches

    B.   44 square inches

    C.   121 square inches

    D. 1,331 square inches

8. What is the volume of a cube with a side length of 17 centimeters? Use the formula $V = s^3$, where s is the side length of the cube.

    A.   20 cubic centimeters

    B.   51 cubic centimeters

    C.   289 cubic centimeters

    D. 4,913 cubic centimeters

9. Use the expression $(8g - 4h) \div h^2$ to answer the questions below.

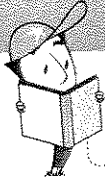   **A.** What is the value of the expression when $g = 6$, and $h = 3$?

    B. Explain how you used the order of operations to find the value of the expression.

Lesson Practice

Choose the correct answer.

1. Which expression is equivalent to $b + b + b + b$?

   A. $4b$

   B. $b + 4$

   C. b^4

   D. $b \div 4$

2. Which expression is equivalent to $7(3 + g)$?

   A. $21 + g$

   B. $10g$

   C. $21 + 7g$

   D. $21g$

3. Which expression is **not** equivalent to $5x + 6$?

   A. $4x + 7 + x - 1$

   B. $3x + 3 + 2x + 3$

   C. $5(x + 1) + 1$

   D. $x(5 + 6)$

4. Which expression is equivalent to $4t + 3t$?

   A. $7t^2$

   B. $7 + 2t$

   C. $7t$

   D. $12t$

5. Which expression is equivalent to $9c + 12d + 2c$?

   A. $18c^2 + 12d$

   B. $11c + 12d$

   C. $11c^2 + 12d$

   D. $23cd$

6. Which expression is **not** equivalent to $4k + 12$?

   A. $3k + 4 + k + 8$

   B. $3(k + 3) + 3$

   C. $4(k + 3)$

   D. $2(2k + 5) + 2$

7. Which expression is equivalent to $6(p + 5)$?

   A. $30 + 6p$

   B. $30p$

   C. $30 + p$

   D. $11p$

8. For which value or values are the expressions $15k + 9$ and $3(2k + 3) + 9k$ equivalent?

   A. no values

   B. 3

   C. 3, 5, and 8

   D. all values

9. The lengths of the sides of a triangle are represented by $3m$, $3m$, and $3m$.

   A. What is an expression, in simplest form, for the perimeter of the triangle?

   B. Use the distributive property to write an equivalent expression for the perimeter of the triangle.