

# Evaluating Expressions and Using Formulas

To evaluate an expression for given values of the variables, substitute the given numbers for the variables in the expression. Then, perform the operations in the expression. Note that the fraction bar means division.  $\frac{9y}{3}$  means 9y divided by 3.

ALGEBRAIC EXPRESSION	SUBSTITUTE	NUMBER EXPRESSION	VALUE
$x + 7$	$x = 9$	$9 + 7$	16
$12z$	$z = 4$	$12 \cdot 4$	48
$\frac{9y}{3}$	$y = 6$	$\frac{9 \times 6}{3}$	18
$t + 7x$	$t = 21, x = 2$	$21 + 7 \cdot 2$	35

To use a formula, substitute the numbers you know. Then, perform the operations to find the value of the variable.

Find the area of a rectangle with a length of 9 inches and a width of 7 inches.

Write the formula.

$$A = l \times w$$

Substitute.

$$A = 9 \times 7$$

Multiply.

$$A = 63$$

The area is 63 square inches.

Find the value of each expression.

1.  $x^2$  when  $x = 7$

2.  $3y^2 + 3$  when  $y = 4$

3.  $-3(z + 5)$  when  $z = 4$

4.  $2a + 6$  when  $a = 4$

5.  $b - 5$  when  $b = 10$

6.  $4c \times 1$  when  $c = 5$

Find the value of each expression when  $a = 3$ ,  $b = 9$ , and  $c = 18$ .

7.  $a + b + c$

8.  $abc$

9.  $2a^3 + b$

10.  $5c - 2a^2$

Find the unknown number.

11.  $P = 4s$ ;  $s = 5$

12.  $A = \frac{1}{2}bh$ ;  $b = 4$ ,  $h = 5$

**Directions:** Choose the one best answer to each item. Circle the number of the correct answer.

13. Bart drove 60 mph for 2 hours. Using the formula Distance = Rate  $\times$  Time or  $d = r \cdot t$ , find the distance Bart drove.
- (1) 30 miles
  - (2) 120 miles
  - (3) 62 miles
  - (4) 58 miles
  - (5) none of the above
14. Coleen worked twice as many hours this week as last week. She wrote the expression  $2h$  to show the number of hours she worked this week. If  $h = 25$ , how many hours did she work this week?
- (1) 25 hours
  - (2) 50 hours
  - (3) 75 hours
  - (4) 100 hours
  - (5) none of the above
15. Brendan wrote the expression  $g \div 5$  to show how many players will be on a Little League team after he divides the group ( $g$ ) into 5 teams. If  $g = 60$ , how many are on each team?
- (1) 65 players
  - (2) 55 players
  - (3) 300 players
  - (4) 12 players
  - (5) 15 players
16. Maggie wrote the expression  $\frac{x}{12}$  to show the number of feet a room measures in length. If  $x = 132$ , what is the length of the room in feet?
- (1) 12 feet
  - (2) 11 feet
  - (3) 10 feet
  - (4) 9 feet
  - (5) none of the above
17. Lisa's bowling score for her first game ( $f$ ) was 110. Her second game ( $s$ ) was 130 and her third game ( $t$ ) was 135. Using the formula  $(f + s + t) \div 3 = A$ , what is her average ( $A$ ) for the three games?
- (1) 120
  - (2) 125
  - (3) 135
  - (4) 145
  - (5) 150
18. The cost per disk ( $r$ ) to ABC Computer Company is \$3. The total cost ( $c$ ) for the number of disks bought was \$1,500. The number of disks bought ( $n$ ) was 500. Which formula represents the situation?
- (1)  $c = \frac{r}{n}$
  - (2)  $r = nc$
  - (3)  $rc = n$
  - (4)  $r + n = c$
  - (5)  $c = nr$
19. How much interest will you pay to borrow \$4,250 (principal) for a year at a rate of 4% (.04)? Use the formula: Interest = Principal  $\times$  Rate, or  $I = P \times R$ .
- (1) \$1.70
  - (2) \$17
  - (3) \$170
  - (4) \$1,700
  - (5) none of the above
20. How much interest will you pay to borrow \$10,000 (principal) for a year at a rate of 8% (.08)? Use the formula: Interest = Principal  $\times$  Rate, or  $I = P \times R$ .
- (1) \$8
  - (2) \$80
  - (3) \$800
  - (4) \$8,000
  - (5) none of the above