

**1-6 Study Guide and Intervention****Algebra: Variables and Expressions**

To evaluate an algebraic expression you replace each variable with its numerical value, then use the order of operations to simplify.

**Example 1 Evaluate  $6x - 7$  if  $x = 8$ .**

$$\begin{aligned} 6x - 7 &= 6(8) - 7 && \text{Replace } x \text{ with } 8. \\ &= 48 - 7 && \text{Use the order of operations.} \\ &= 41 && \text{Subtract 7 from 48.} \end{aligned}$$

**Example 2 Evaluate  $5m - 3n$  if  $m = 6$  and  $n = 5$ .**

$$\begin{aligned} 5m - 3n &= 5(6) - 3(5) && \text{Replace } m \text{ with } 6 \text{ and } n \text{ with } 5. \\ &= 30 - 15 && \text{Use the order of operations.} \\ &= 15 && \text{Subtract 15 from 30.} \end{aligned}$$

**Example 3 Evaluate  $\frac{ab}{3}$  if  $a = 7$  and  $b = 6$ .**

$$\begin{aligned} \frac{ab}{3} &= \frac{(7)(6)}{3} && \text{Replace } a \text{ with } 7 \text{ and } b \text{ with } 6. \\ &= \frac{42}{3} && \text{The fraction bar is like a grouping symbol.} \\ &= 14 && \text{Divide.} \end{aligned}$$

**Example 4 Evaluate  $x^3 + 4$  if  $x = 3$ .**

$$\begin{aligned} x^3 + 4 &= 3^3 + 4 && \text{Replace } x \text{ with } 3. \\ &= 27 + 4 && \text{Use the order of operations.} \\ &= 31 && \text{Add 27 and 4.} \end{aligned}$$

**Exercises**

Evaluate each expression if  $a = 4$ ,  $b = 2$ , and  $c = 7$ .

1.  $3ac$

2.  $5b^3$

3.  $abc$

4.  $5 + 6c$

5.  $\frac{ab}{8}$

6.  $2a - 3b$

7.  $\frac{b^4}{4}$

8.  $c - a$

9.  $20 - bc$

10.  $2bc$

11.  $ac - 3b$

12.  $6a^2$

13.  $7c$

14.  $6a - b$

15.  $ab - c$

**1-6****Practice****Algebra: Variables and Expressions**Evaluate each expression if  $r = 5$ ,  $s = 2$ ,  $t = 7$ , and  $u = 1$ .

1.  $s + 7$

2.  $9 - u$

3.  $3t + 1$

4.  $5r - 4$

5.  $t - s$

6.  $u + r$

7.  $11t - 7$

8.  $6 + 3u$

9.  $4r - 10s$

10.  $3u^2$

11.  $2t^2 - 18$

12.  $r^2 + 8$

13.  $\frac{s}{2}$

14.  $\frac{30}{r}$

15.  $\frac{(3 + u)^2}{8}$

Evaluate each expression if  $a = 4.1$ ,  $b = 5.7$ , and  $c = 0.3$ .

16.  $a + b - c$

17.  $10 - (a + b)$

18.  $b - c + 2$

19. **MOON** The expression  $\frac{w}{6}$  gives the weight of an object on the Moon in pounds with a weight of  $w$  pounds on Earth. What is the weight of a space suit on the Moon if the space suit weighs 178.2 pounds on Earth?

20. Complete the table.

Pounds ( $p$ )	Ounces ( $16p$ )
1	16
2	32
3	
4	
5	

**1-8****Skills Practice****Algebra: Properties**

Use the Distributive Property to write each expression as an equivalent expression. Then evaluate the expression.

1.  $3(5 + 1)$

2.  $(2 + 7)5$

3.  $(10 + 2)7$

4.  $2(9 - 8)$

5.  $4(10 - 2)$

6.  $6(13 + 4)$

Name the property shown by each statement.

7.  $2 \times (3 \times 7) = (2 \times 3) \times 7$

8.  $6 + 3 = 3 + 6$

9.  $3(9 - 7) = 3(9) - 3(7)$

10.  $18 \times 1 = 18$

11.  $7 \times 2 = 2 \times 7$

12.  $6 + (1 + 4) = (6 + 1) + 4$

13.  $7 + 0 = 7$

14.  $0 + 12 = 12$

15.  $625 + 281 = 281 + 625$

16.  $(12 \times 18) \times 5 = 12 \times (18 \times 5)$

17.  $2(8 + 2) = 2(8) + 2(2)$

18.  $(15 + 11) + 9 = 15 + (11 + 9)$

19.  $(6 + r) + s = 6 + (r + s)$

20.  $(4 \times 8) \times a = 4 \times (8 \times a)$

21.  $p \times 1 = p$

22.  $a + 5 = 5 + a$

23.  $y \times 3 = 3 \times y$

24.  $b + 0 = b$

25.  $(x + y) + z = x + (y + z)$

26.  $6(200 + 50) = 6(200) + 6(50)$

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

# WS "Stilwell Skills Practice 1-8"

For questions 1-15, name the property using the list below:

**Identity of Addition (IA)**

**Commutative of Addition (CA)**

**Associative of Addition (AA)**

**Identify of Multiplication (IM)**

**Commutative of Multiplication (CM)**

**Associative of Multiplication (AM)**

- \_\_\_\_\_ 1)  $19 \times 1 = 19$   
\_\_\_\_\_ 2)  $(9 + 1) + 3 = 9 + (1 + 3)$   
\_\_\_\_\_ 3)  $(2 \times 1) \times 3 = 2 \times (1 \times 3)$   
\_\_\_\_\_ 4)  $16 + 4 = 4 + 16$   
\_\_\_\_\_ 5)  $9 \times 11 = 11 \times 9$   
\_\_\_\_\_ 6)  $40 + 0 = 40$   
\_\_\_\_\_ 7)  $8 + (4 + 5) = (8 + 4) + 5$   
\_\_\_\_\_ 8)  $(8 \times 4) \times 3 = 8 \times (4 \times 3)$   
\_\_\_\_\_ 9)  $a + (3 + 4) = (a + 3) + 4$   
\_\_\_\_\_ 10)  $5 \times b = b \times 5$   
\_\_\_\_\_ 11)  $(rs)t = r(st)$   
\_\_\_\_\_ 12)  $(r + s) + t = r + (s + t)$   
\_\_\_\_\_ 13)  $t + m = m + t$   
\_\_\_\_\_ 14)  $m + 0 = m$   
\_\_\_\_\_ 15)  $b \times 1 = b$

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For questions 16-27, supply the missing number or variable:

- 16)  $7 + 4 = 4 + \underline{\hspace{1cm}}$   
17)  $(6 + 7) + 4 = 6 + (\underline{\hspace{1cm}} + 4)$   
18)  $0 + 8 = \underline{\hspace{1cm}}$   
19)  $5 \times 7 = 7 \times \underline{\hspace{1cm}}$   
20)  $3 + (5 + 1) = (3 + 5) + \underline{\hspace{1cm}}$   
21)  $1 \times \underline{\hspace{1cm}} = 19$   
22)  $16 + 4 = \underline{\hspace{1cm}} + 16$   
23)  $(2 \times 1) \times 3 = \underline{\hspace{1cm}} \times (1 \times 3)$   
24)  $(3 + 8) + 6 = \underline{\hspace{1cm}} + (8 + 6)$   
25)  $6 + y = \underline{\hspace{1cm}} + 6$   
26)  $\underline{\hspace{1cm}} \times 38 = 38 \times 10$   
27)  $9 \times (20 \times \underline{\hspace{1cm}}) = (9 \times 20) \times 6$

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## WS "Stilwell Practice 1-8"

Use the **Distributive Property** (SHARE!!!) to *write* each expression as an equivalent expression.

1)  $5(k + r) =$  \_\_\_\_\_

2)  $7(9 + 8) =$  \_\_\_\_\_

3)  $3(b - a) =$  \_\_\_\_\_

4)  $6(12 - 3) =$  \_\_\_\_\_

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Use the **Distributive Property** to fill in each missing blank.

5)  $3x + 3z =$  \_\_\_\_\_  $(x + z)$

6)  $6(5) - 6(3) = 6(\text{---} - \text{---})$

7)  $21y - 21w = 21(\text{---} - \text{---})$

8)  $8(3) + 8(7) =$  \_\_\_\_\_  $(3 + 7)$

# 1-10 Study Guide and Intervention

## Algebra: Equations and Functions

The solution of an equation with two variables consists of two numbers, one for each variable that makes the equation true. When a relationship assigns exactly one output value for each input value, it is called a function. Function tables help to organize input numbers, output numbers, and function rules.

**Example 1.** Complete a function table for  $y = 5x$ .

Choose four values for  $x$ . Substitute the values for  $x$  into the expression. Then evaluate to find the  $y$  value.

$x$	$5x$	$y$
0	$5(0)$	0
1	$5(1)$	5
2	$5(2)$	10
3	$5(3)$	15

### Exercises

Complete the following function tables.

1.  $y = x + 4$

$x$		$y$
0		
1		
2		
3		

2.  $y = 10x$

$x$		$y$
1		
2		
3		
4		

3.  $y = x - 1$

$x$		$y$
2		
3		
4		
5		

4.  $y = 3x$

$x$		$y$
10		
11		
12		
13		

**1-10**

**Practice**

**Algebra: Equations and Functions**

Complete each function table.

1.  $y = 5x$

$x$		$y$
1		
2		
3		
4		

2.  $y = 8x$

$x$		$y$
1		
2		
3		
4		

3.  $y = 7x$

$x$		$y$
3		
4		
5		
6		

4.  $y = x - 2$

$x$		$y$
2		
3		
4		
5		

5.  $y = x + 3$

$x$		$y$
2		
3		
4		
5		

6.  $y = x + 75$

$x$		$y$
0		
1		
2		
3		

7. **PRODUCTION** A car manufacturer makes 15,000 hybrid cars a month. Using the function table, find the number of hybrid cars produced after 3, 6, 9, and 12 months.

$m$	$15,000m$	$P$
3		
6		
9		
12		

8. **SUNSPOTS** The changing activity of sunspots, which are cooler and darker areas of the sun, occur in 11-year cycles. Use the function  $y = 11c$  to find the numbers of years necessary to complete 1, 2, 3, and 4 sunspot cycles.

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# Chapter 1.2 Bringing It All Together

(Variables & Expressions, Properties, Equations & Functions)

## Vocabulary Check

Word Bank		
variable	algebraic expression	equation
solution	function	numerical expression

Choose from the terms above to complete each sentence.

- 1)  $A(n)$  \_\_\_\_\_ contains variables, numbers, and at least one operation.
- 2)  $A(n)$  \_\_\_\_\_ is a mathematical sentence that contains an equal sign.
- 3) A relationship in which each input value results in exactly one output value is called a(n) \_\_\_\_\_.

Define the following vocabulary words:

- 4) Properties: \_\_\_\_\_
- 5) Variable: \_\_\_\_\_

## 1-6 Variables and Expressions (pp. 44-47)

Evaluate each expression if  $a = 10$ ,  $b = 4$  and  $c = 8$ . Show your work 😊

6)  $(a - b)^2$

7)  $ab \div c$

8)  $3b^2 + c$

9)  $\frac{(b + c)^2}{3}$

Evaluate each expression if  $r = 5$  and  $s = 6$ . Show your work 😊

10)  $2r + 3s$

11)  $r^2 - 3s$

12)  $rs \div 5$

13)  $r^3 s^2$

OVER →



Name \_\_\_\_\_ Date \_\_\_\_\_ Pd \_\_\_\_\_

## 1-8 Properties (pp. 53-56)

Name the property shown by each statement.

\_\_\_\_\_ 14)  $9 \times 7 = 7 \times 9$

\_\_\_\_\_ 15)  $3(9 - 7) = 3 \times 9 - 3 \times 7$

\_\_\_\_\_ 16)  $2b + 0 = 2b$

\_\_\_\_\_ 17)  $2 \times (8 \times 5) = (2 \times 8) \times 5$

\_\_\_\_\_ 18)  $1 \times 87 = 87$

\_\_\_\_\_ 19)  $5(w + 1) = (w + 1)5$

\_\_\_\_\_ 20)  $4(d + f) = 4(f + d)$

\_\_\_\_\_ 21)  $(6 \times 8)2 = 6(8 \times 2)$

\_\_\_\_\_ 22)  $r + 6 = 6 + r$

\_\_\_\_\_ 23)  $(4 + 3) + 6 = 4 + (3 + 6)$

Use the Distributive Property (SHARE!!!) to *write* each expression as an equivalent expression.

24)  $4(5 + 7) =$  \_\_\_\_\_ 25)  $8(a + m) =$  \_\_\_\_\_

26)  $3(9 - 6) =$  \_\_\_\_\_ 27)  $7(y - z) =$  \_\_\_\_\_

Use the Distributive Property to fill in each missing blank.

28)  $42y - 42w = 42(\text{---} - \text{---})$  29)  $2(3) + 2(5) = \text{---}(3 + 5)$

## 1-10 Equations and Functions (pp. 57-61)

Complete each function table. Show your work ☺

30)  $y = 4x$

$x$		$y$
5		
6		
7		
8		

31)  $y = 2x - 1$

$x$		$y$
4		
10		
15		
25		

**FINALLY  
DONE**

