

**Practice with Examples**

For use with pages 174–179

**GOAL**

Solve a formula or literal equation for one of its variables and rewrite an equation in function form

**VOCABULARY**

A **formula** is an algebraic equation that relates two or more real-life quantities.

A two-variable equation is written in **function form** if one of its variables is isolated on one side of the equation.

**EXAMPLE 1****Solving and Using an Area Formula**Use the formula for the area of a rectangle,  $A = lw$ .

- Solve the formula for the width  $w$ .
- Use the new formula to find the width of a rectangle that has an area of 72 square inches and a length of 9 inches.

**SOLUTION**

- Solve for width  $w$ .

$$A = lw \quad \text{Write original formula.}$$

$$\frac{A}{l} = \frac{lw}{l} \quad \text{To isolate } w, \text{ divide each side by } l.$$

$$\frac{A}{l} = w \quad \text{Simplify.}$$

- Substitute the given values into the new formula.

$$w = \frac{A}{l} = \frac{72}{9} = 8$$

The width of the rectangle is 8 inches.

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### Exercises for Example 1

Solve for the indicated variable.

1. Area of a Triangle

Solve for  $h$ :  $A = \frac{1}{2}bh$

2. Circumference of a Circle

Solve for  $r$ :  $C = 2\pi r$

3. Simple Interest

Solve for  $P$ :  $I = Prt$

4. Simple Interest

Solve for  $r$ :  $I = Prt$

### EXAMPLE 2 Rewriting an Equation in Function Form

- a. Rewrite the equation  $19 - 3y = 8x - 2x + 10$  so that  $y$  is a function of  $x$ .
- b. Use the result to find  $y$  when  $x = -2, -1, 0,$  and  $1$ .

#### SOLUTION

a.	$19 - 3y = 8x - 2x + 10$	Write original equation.
	$19 - 3y = 6x + 10$	Combine like terms.
	$19 - 19 - 3y = 6x + 10 - 19$	Subtract 19 from each side.
	$-3y = 6x - 9$	Simplify.
	$\frac{-3y}{-3} = \frac{6x - 9}{-3}$	Divide each side by $-3$ .
	$y = -2x + 3$	Simplify.

The equation  $y = -2x + 3$  represents  $y$  as a function of  $x$ .

b. INPUT	SUBSTITUTE	OUTPUT
$x = -2$	Substitute $y = -2(-2) + 3$	Simplify $y = 7$
$x = -1$	Substitute $y = -2(-1) + 3$	Simplify $y = 5$
$x = 0$	Substitute $y = -2(0) + 3$	Simplify $y = 3$
$x = 1$	Substitute $y = -2(1) + 3$	Simplify $y = 1$

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### ***Exercises for Example 2***

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**Rewrite each equation so that  $y$  is a function of  $x$ . Then use the result to find  $y$  when  $x = -2, -1, 0,$  and  $1$ .**

5.  $-7x + y = 8$

6.  $6y - 3x = 12$

7.  $20x = 4y - 4$