

# 3.8 Rewrite Equations and Formulas

TEKS a.4, A.4.A

**Before**

You wrote functions and used formulas.

**Now**

You will rewrite equations and formulas.

**Why?**

So you can solve a problem about bowling, as in Ex. 33.



## Key Vocabulary

- **literal equation**
- **formula**, p. 30

The equations  $2x + 5 = 11$  and  $6x + 3 = 15$  have the general form  $ax + b = c$ . The equation  $ax + b = c$  is called a **literal equation** because the coefficients and constants have been replaced by letters. When you solve a literal equation, you can use the result to solve any equation that has the same form as the literal equation.

### EXAMPLE 1 Solve a literal equation

Solve  $ax + b = c$  for  $x$ . Then use the solution to solve  $2x + 5 = 11$ .

#### Solution

**STEP 1** Solve  $ax + b = c$  for  $x$ .

$$ax + b = c \quad \text{Write original equation.}$$

$$ax = c - b \quad \text{Subtract } b \text{ from each side.}$$

$$x = \frac{c - b}{a} \quad \text{Assume } a \neq 0. \text{ Divide each side by } a.$$

**STEP 2** Use the solution to solve  $2x + 5 = 11$ .

$$x = \frac{c - b}{a} \quad \text{Solution of literal equation}$$

$$= \frac{11 - 5}{2} \quad \text{Substitute 2 for } a, 5 \text{ for } b, \text{ and 11 for } c.$$

$$= 3 \quad \text{Simplify.}$$

▶ The solution of  $2x + 5 = 11$  is 3.

**VARIABLES IN DENOMINATORS** In Example 1, you must assume that  $a \neq 0$  in order to divide by  $a$ . In general, if you have to divide by a variable when solving a literal equation, you should assume that the variable does not equal 0.



### GUIDED PRACTICE for Example 1

Solve the literal equation for  $x$ . Then use the solution to solve the specific equation.

1.  $a - bx = c$ ;  $12 - 5x = -3$

2.  $ax = bx + c$ ;  $11x = 6x + 20$