

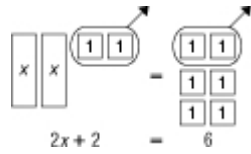
## Lesson 8-2

### Example 1 Solve Two-Step Equations

Solve  $2x + 2 = 6$ .

#### Method 1 Use a model.

Remove 2 tiles from the mat.  
Equality.



$$2x + 2 = 6 \quad \text{Write the equation.}$$

$$\begin{array}{r} 2x + 2 = 6 \\ -2 \quad -2 \\ \hline 2x = 4 \end{array} \quad \text{Subtract 2 from each side.}$$

Use the Division Property of Equality.

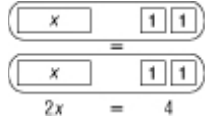
$$2x = 4$$

$$\begin{array}{r} 2x = 4 \\ \hline x = 2 \end{array}$$

Divide each side by 2.

Simplify.

Separate the remaining tiles into  
2 equal groups.



There are 2 tiles in each group.  
The solution is 2.

### Example 2 Solve Two-Step Equations

Solve  $-3 = \frac{1}{2}m + 5$ .

$$-3 = \frac{1}{2}m + 5 \quad \text{Write the equation.}$$

$$-3 - 5 = \frac{1}{2}m + 5 - 5 \quad \text{Subtract 5 from each side.}$$

$$-8 = \frac{1}{2}m \quad \text{Simplify.}$$

$$2(-8) = 2 \cdot \frac{1}{2}m \quad \text{Multiply each side by 2.}$$

$$-16 = m \quad \text{Simplify.}$$

The solution is  $-16$ .

Check this solution.

**Example 3 Equations with Negative Coefficients**  
**Solve  $6 - 4x = 46$ .**

$6 - 4x = 46$	Write the equation.
$6 + (-4x) = 46$	Definition of subtraction
$6 - 6 + (-4x) = 46 - 6$	Subtract 6 from each side.
$-4x = 40$	Simplify.
$\frac{-4x}{-4} = \frac{40}{-4}$	Divide each side by $-4$ .
$x = -10$	Simplify.

The solution is  $-10$ .      Check this solution.

**Example 4 Combine Like Terms First**  
**Solve  $-4y + y - 3 = 15$ . Check your solution.**

$-4y + y - 3 = 15$	Write the equation.
$-4y + 1y - 3 = 15$	Identity Property; $y = 1y$
$-3y - 3 = 15$	Combine like terms; $-4y + 1y = (-4 + 1)y$ or $-3y$ .
$-3y - 3 + 3 = 15 + 3$	Add 3 to each side.
$-3y = 18$	Simplify.
$\frac{-3y}{-3} = \frac{18}{-3}$	Divide each side by $-3$ .
$y = -6$	Simplify.

<b>Check</b>	$4y + y - 3 = 15$	Write the equation.
	$-4(-6) + (-6) - 3 \stackrel{?}{=} 15$	Replace $y$ with $-6$ .
	$24 + (-6) - 3 \stackrel{?}{=} 15$	Multiply.
	$15 = 15 \checkmark$	The statement is true.

The solution is  $-6$ .