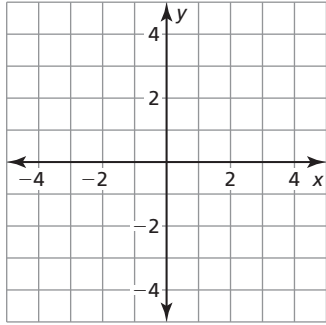


**Chapter 5**

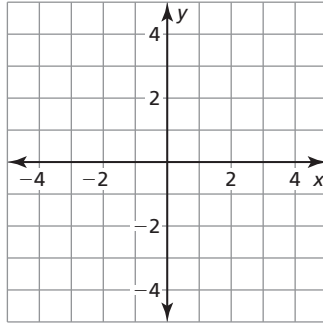
**Maintaining Mathematical Proficiency**

Graph the equation.

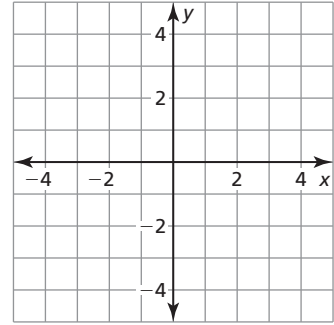
1.  $y + 2 = x$



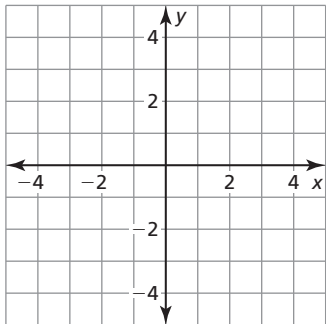
2.  $2x - y = 3$



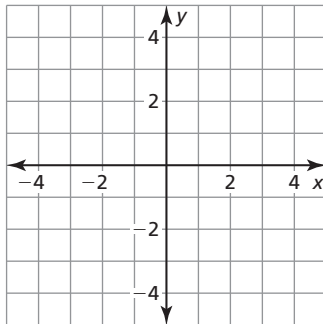
3.  $5x + 2y = 10$



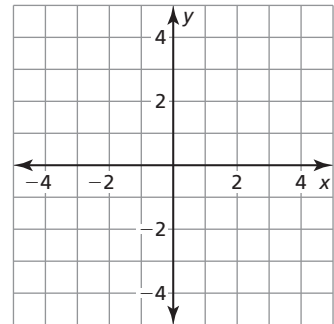
4.  $y - 3 = x$



5.  $3x - y = -2$



6.  $3x + 4y = 12$



Solve the inequality. Graph the solution.

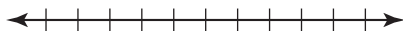
7.  $a - 3 > -2$



8.  $-4 \geq -2c$



9.  $2d - 5 < -3$



10.  $8 - 3r \leq 5 - 2r$



# 5.1

## Solving Systems of Linear Equations by Graphing

For use with Exploration 5.1

**Essential Question** How can you solve a system of linear equations?

### 1 EXPLORATION: Writing a System of Linear Equations

**Work with a partner.** Your family opens a bed-and-breakfast. They spend \$600 preparing a bedroom to rent. The cost to your family for food and utilities is \$15 per night. They charge \$75 per night to rent the bedroom.

- a. Write an equation that represents the costs.

$$\begin{array}{l} \text{Cost, } C \\ \text{(in dollars)} \end{array} = \begin{array}{l} \$15 \text{ per} \\ \text{night} \end{array} \cdot \begin{array}{l} \text{Number of} \\ \text{nights, } x \end{array} + \$600$$

- b. Write an equation that represents the revenue (income).

$$\begin{array}{l} \text{Revenue, } R \\ \text{(in dollars)} \end{array} = \begin{array}{l} \$75 \text{ per} \\ \text{night} \end{array} \cdot \begin{array}{l} \text{Number of} \\ \text{nights, } x \end{array}$$

- c. A set of two (or more) linear equations is called a **system of linear equations**. Write the system of linear equations for this problem.

### 2 EXPLORATION: Using a Table or Graph to Solve a System

Go to [BigIdeasMath.com](http://BigIdeasMath.com) for an interactive tool to investigate this exploration.

**Work with a partner.** Use the cost and revenue equations from Exploration 1 to determine how many nights your family needs to rent the bedroom before recovering the cost of preparing the bedroom. This is the *break-even point*.

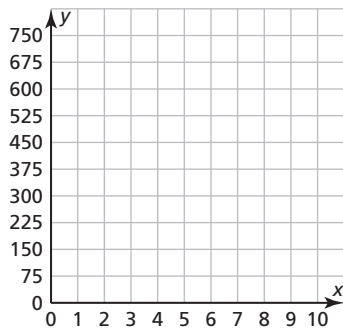
- a. Complete the table.

<b>x (nights)</b>	0	1	2	3	4	5	6	7	8	9	10	11
<b>C (dollars)</b>												
<b>R (dollars)</b>												

**5.1 Solving Systems of Linear Equations by Graphing (continued)**

**2 EXPLORATION: Using a Table or Graph to Solve a System (continued)**

- b. How many nights does your family need to rent the bedroom before breaking even?
  
- c. In the same coordinate plane, graph the cost equation and the revenue equation from Exploration 1.



- d. Find the point of intersection of the two graphs. What does this point represent? How does this compare to the break-even point in part (b)? Explain.

**Communicate Your Answer**

- 3. How can you solve a system of linear equations? How can you check your solution?
  
- 4. Solve each system by using a table or sketching a graph. Explain why you chose each method. Use a graphing calculator to check each solution.
 

<p>a. <math>y = -4.3x - 1.3</math> <math>y = 1.7x + 4.7</math></p>	<p>b. <math>y = x</math> <math>y = -3x + 8</math></p>	<p>c. <math>y = -x - 1</math> <math>y = 3x + 5</math></p>
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