

# 8-2 Linear Equations in Two Variables

(Pages 375–379)

Solving an equation means finding replacement values for the variable that make a true sentence. An equation such as  $y = 2x + 3$  is a **linear equation** because its graph is a straight line. The solutions of an equation with two variables are ordered pairs. An equation with two variables usually has an infinite number of solutions.

<b>Graphing Linear Equations</b>	<p>To graph a linear equation with two variables, use the following procedure:</p> <ul style="list-style-type: none"> <li>• Choose any convenient values for <math>x</math>.</li> <li>• Substitute each <math>x</math>-value in the equation and solve to find each corresponding <math>y</math>-value. Write these solutions as <math>(x, y)</math> pairs.</li> <li>• Graph at least 3 of the ordered pairs and draw the straight line that passes through them.</li> </ul>
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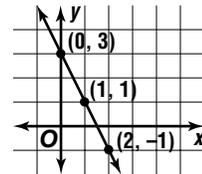
### Example

**Find four solutions for the equation  $2x + y = 3$ . Then graph the equation.**

Choose values for  $x$ :  $-1, 0, 1, 2$ . Find the corresponding values for  $y$  by substituting each  $x$ -value in the equation and solving for  $y$ .

$$\begin{array}{l} 2(-1) + y = 3 \\ y = 5 \end{array} \qquad \begin{array}{l} 2(0) + y = 3 \\ y = 3 \end{array} \qquad \begin{array}{l} 2(1) + y = 3 \\ y = 1 \end{array} \qquad \begin{array}{l} 2(2) + y = 3 \\ y = -1 \end{array}$$

Write these solutions as ordered pairs:  $(-1, 5), (0, 3), (1, 1), (2, -1)$ .



### Try This Together

1. Which of these ordered pairs are solutions of  $x + y = 8$ ?

- a.  $(7, 1)$       b.  $(-3, 11)$       c.  $(2, -9)$       d.  $(4, 4)$

*HINT: There may be more than one pair that makes the equation true.*

### Practice

**Which of these ordered pairs is a solution of the given equation?**

2.  $2x + y = -6$       a.  $(-8, 4)$       b.  $(-1, -4)$       c.  $(5, -16)$       d.  $(9, 1)$   
 3.  $-3x = 2y$       a.  $(1, -1)$       b.  $(7, 10)$       c.  $(-2, 3)$       d.  $(5, 5)$

**Find four solutions for each equation and write them as ordered pairs. Then graph the equation.**

4.  $y = -3x$       5.  $y = 2x - 3$       6.  $y - x = 2$

7. **Standardized Test Practice** Which ordered pair is a solution of the equation  $y - x = 7$ ?

- A  $(1, 6)$       B  $(-1, -6)$       C  $(-1, 6)$       D  $(1, -6)$

Answers: 1. a, b, d 2. b, c 3. c 4-6. See Answer Key 7. C