

8-3 Graphing Linear Relations (Pages 385–390)

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.

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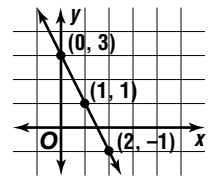
EXAMPLE

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 .

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

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