8-2 Study Guide and Intervention

Linear Equations in Two Variables

A function can be represented with an equation. An equation such as $y = 1.50x$ is called a linear equation. A linear equation in two variables is an equation in which the variables appear in separate terms and neither variable contains an exponent other than 1.

Linear Equations $\quad y = x + 1, \; y = -2x, \; y = \frac{1}{3}x$

Nonlinear Equations $\quad y = x^2 + 1, \; y = -2x^3, \; y = \frac{3}{x}, \; xy = 4$

Solutions of a linear equation are ordered pairs that make the equation true. One way to find solutions is to make a table.

Example 1 Complete the table. Use the results to write four solutions of $y = 4x - 10$. Write the solution as ordered pairs.

x	$y = 4x - 10$	y	(x, y)
-1	$y = 4(-1) - 10$	-14	$(-1, -14)$
0	$y = 4(0) - 10$	-10	$(0, -10)$
1	$y = 4(1) - 10$	-6	$(1, -6)$
2	$y = 4(2) - 10$	-2	$(2, -2)$

Example 2 A linear equation can also be represented by a graph. The coordinates of all points on a line are solutions to the equation. Graph $y = 4x - 10$ by plotting ordered pairs.

Plot the points found in Example 1. Connect the points using a straight line.
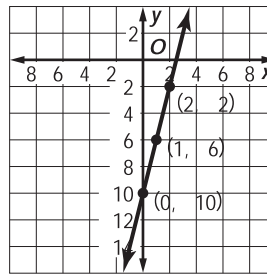
Exercises

Find four solutions of each equation. Write the solutions as ordered pairs.
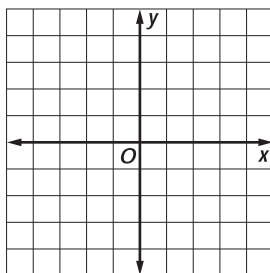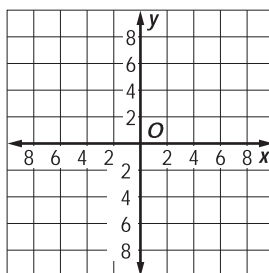
1. $y = 2x + 4$

2. $y = -3x - 7$

3. $4x + y = 5$

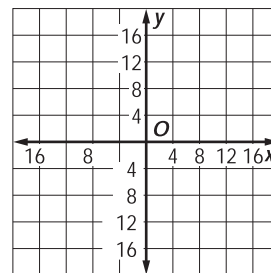**Graph each equation by plotting ordered pairs.**

4. $y = -4x$

5. $y = x + 6$

6. $-2x + y = 8$

8-2 Skills Practice

Linear Equations in Two Variables

Find four solutions of each equation. Write the solutions as ordered pairs.

1. $y = 8x - 4$

2. $y = -x + 12$

3. $4x - 4y = 24$

4. $x - y = -15$

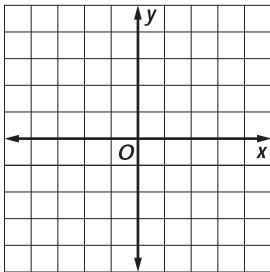**5.** $y = 7x - 6$

6. $y = -3x + 8$

7. $y = 12$

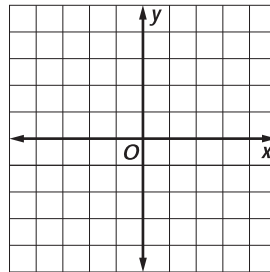**8.** $4x - 2y = 0$

9. $4x - y = 4$

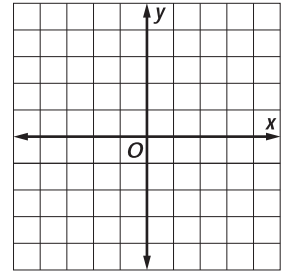**Graph each equation by plotting ordered pairs.**
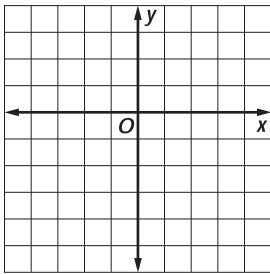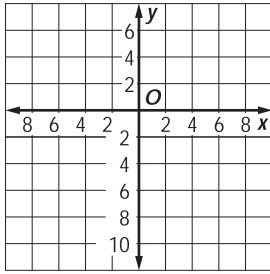
10. $y = 3x - 2$

11. $y = -x + 3$

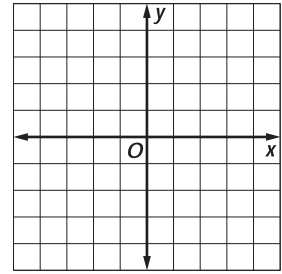**12.** $y = -\dfrac{1}{2}x + \dfrac{3}{2}$
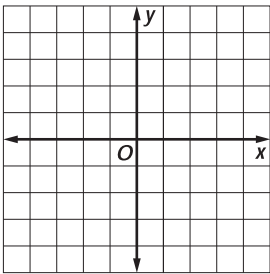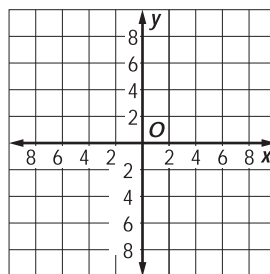
13. $y = -2x - 5$

14. $y = 4x - 8$

15. $y = \dfrac{2}{3}x - 2$

16. $y = -5x$

17. $y = -2x + 6$

18. $y = 5x + 1$

Lesson 8-2
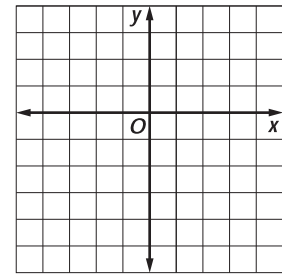
8-2 Practice

Linear Equations in Two Variables

Find four solutions of each equation. Write the solutions as ordered pairs.

1. $y = x - 5$

2. $y = -7$

3. $y = -3x + 1$

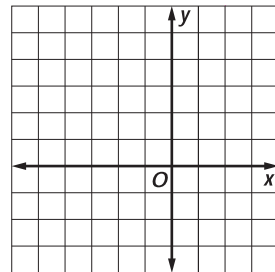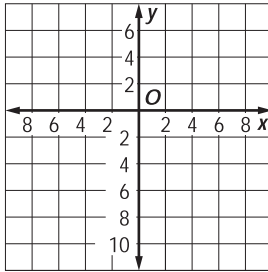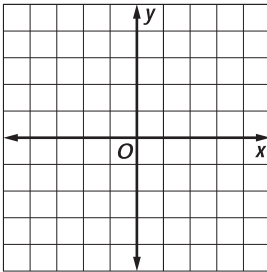**4.** $x - y = 6$

5. $y = 2x + 4$

6. $7x - y = 14$

Graph each equation by plotting ordered pairs.
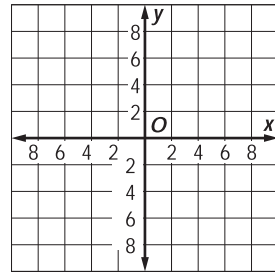
7. $y = 2x - 1$

8. $y = -6x + 2$

9. $y = x + 4$

10. $y = 7$

11. $y = 3x - 9$

12. $y = \frac{1}{2}x - 6$
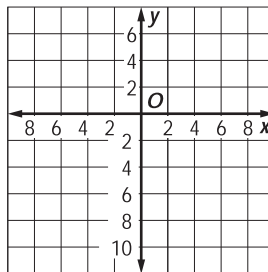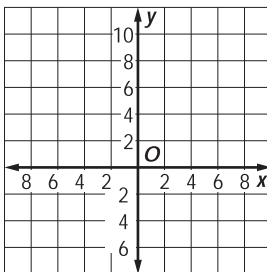
COOKING For Exercises 13–15, use the following information.

Kirsten is making gingerbread cookies using her grandmother's recipe and needs to convert grams to ounces. The equation $y = 0.04x$ describes the approximate number of ounces y in x grams.

13. Find three ordered pairs of values that satisfy this equation.

14. Draw the graph that contains these points.

15. Do negative values of x make sense in this case? Explain.
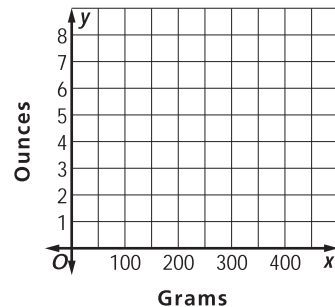
8-2 Enrichment

Equations with Two Variables

Complete the table for each equation.

1. $y = 7 + x$

x	y
−4	
	5
	1

2. $y = 2x + 4$

x	y
6	
	12
	2

3. $y = x - 9$

x	y
3	
	−4
	−9

4. $y = 3x - 2$

x	y
2	
	−5
	7

5. $y = \dfrac{x}{4}$

x	y
8	
	4
	−6

6. $y = -6x + 1$

x	y
1	
	−11
	13

7. $y = 9 - 2x$

x	y
3	
	7
	1

8. $y = \dfrac{x + 5}{3}$

x	y
4	
	4
	−1

9. $y = \dfrac{x}{2} + 5$

x	y
8	
	8
	10

10. $y = x^2$

x	y
2	
	1
	16

11. $y = x^2 - 3$

x	y
3	
	22
	−3

12. $y = 1 - 2x$

x	y
−1	
	7
	11