**Math 6/7 NOTES (9.3)** **Name** _____

# Graphing Linear Functions

The collection of all input values is called the _____ of a function.

The collection of all output values is called the _____ of a function.

**Make a table for the function. Identify the range of the function.**

**1. f(x) = 4x**
Domain: 0, 1, 2, 3

| x | f(x) = 4x | y |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Range:

**2. y = x + 2**
Domain: 11, 15, 22, 27

| x | f(x) = x+2 | y |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Range:

**3. y = x – 3**
Domain: 5, 9, 14, 19

| x | f(x) = x – 3 | y |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

Range:

**4. You have a box with 7 plants that you are planting in a garden.**

Write a rule for y as the function of x, where **y** is the number of plants you have left in the box;

**x** is the number of plants x you have put in the garden so far.

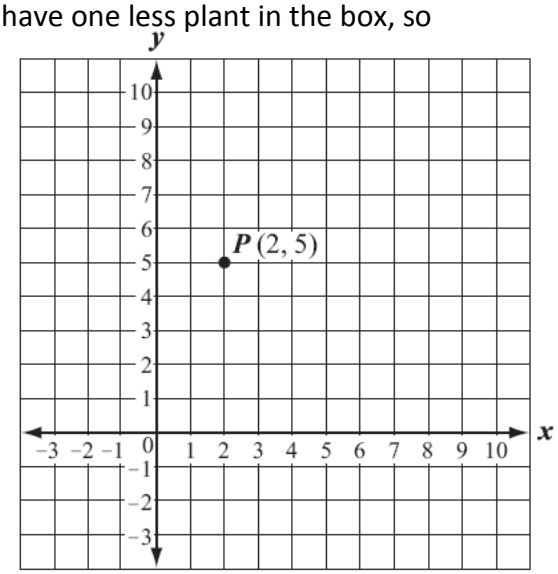
a) In the beginning x = _____, y = _____ .

b) Each time you put one plant in the garden, you have one less plant in the box, so

**y = f(x) =**

c) Make a table and build the graph

| **x** | _____ | **f(x)** | **(x, y )** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |




d) Domain _____ Range _____

e) What are the coordinates of the **point of intersection of the graph and the y-axis**? _____

What does **y-intercept** represent? _____

f) What does the point P represent? _____

g) What are the coordinates of the **point of intersection of the graph and the x-axis**? _____

What does **x-intercept** represent? _____

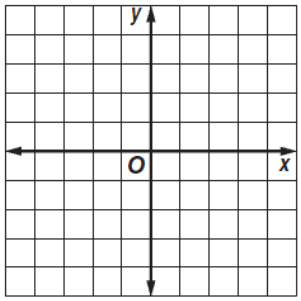
**Find each function value.**

**5.** $f(2)$ if $f(x) = x + 4$ **6.** $f(9)$ if $f(x) = x - 8$ **7.** $f(3)$ if $f(x) = 2x + 2$

**Complete the function table. Then graph the function.**

**8.** $y = x + 3$

| $x$ | $x + 3$ | $y$ | $(x, y)$ |
|---|---|---|---|
| $-2$ | | | |
| $0$ | | | |
| $1$ | | | |
| $2$ | | | |

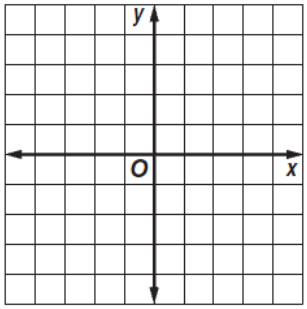



y-int: _____

x-int: _____ ;

**9.** $y = 2x - 1$

| $x$ | $2x - 1$ | $y$ | $(x, y)$ |
|---|---|---|---|
| $-1$ | | | |
| $0$ | | | |
| $1$ | | | |
| $2$ | | | |

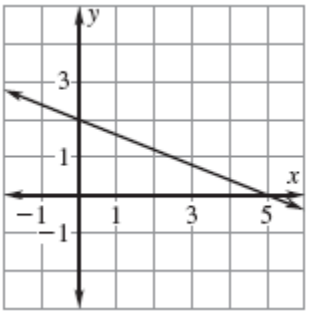



y-int: _____

x-int: _____ ;

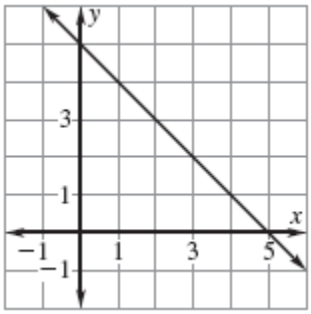
**Identify the x-intercept and the y-intercept of the graph.**

10.



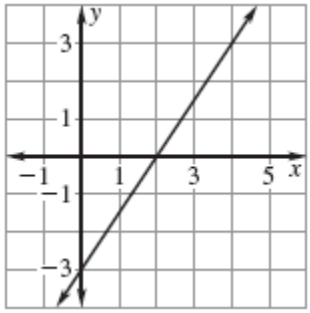

x-int: _____ ; y-int: _____

11.




x-int: _____ ; y-int: _____

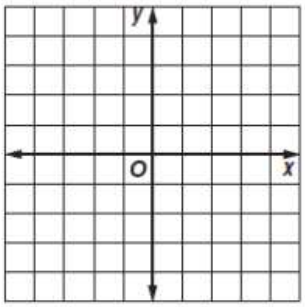
12.



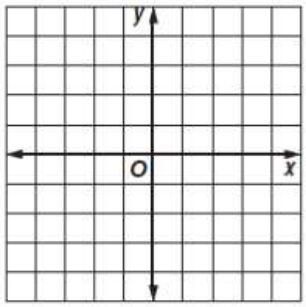

x-int: _____ ; y-int: _____

**Graph each function.**

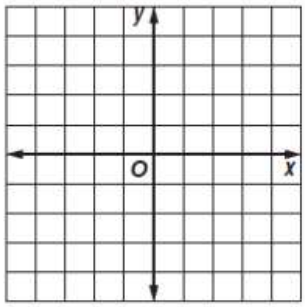
**13.** $y = 3x + 2$




**14.** $y = \frac{x}{2} + 2$




**15.** $y = \frac{x}{3} - 1$



**Math 6/7 Practice (9.3)**

***Questions 1 – 6. Determine whether the relation is a function. Explain.***

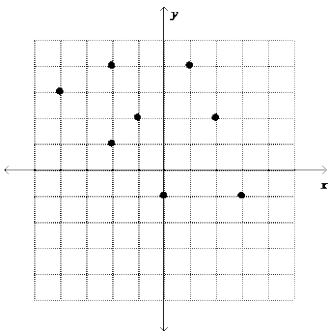
1.

| *x* | *y* |
|---|---|
| 3 | 6 |
| 5 | 10 |
| 6 | 6 |
| 9 | –2 |

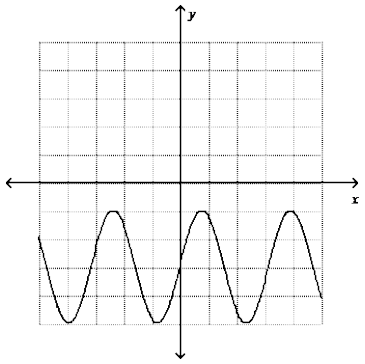
2.

| *x* | *y* |
|---|---|
| 2 | 5 |
| 4 | 7 |
| 8 | 5 |
| 2 | 2 |

3.



4.



5. {(5, 9), (4, 8), (–7, 4), (0, 4), (2, 4), (3, 9), (–3, 8)} _____

6. {(3, 9), (4, 8), (–7, 4), (0, 4), (2, 4), (3, 5), (–3, 8)} _____

***Questions 7-8, Use the chart to answers. Determine whether the relation is a function. Explain.***

| **Area of a Square** | |
|---|---|
| Side Length (cm) | Area ($cm^2$) |
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |
| 5 | 25 |

7. Describe how the area of a square is related to the length of the side.
   a. As the length of the side increases, the area decreases.
   b. As the length of the side increases, the area increases and then decreases.
   c. As the length of the side increases, the area increases.
   d. As the length of the side increases, the area decreases and then increases.

8. Is the relation (side length, area) a function? Explain.
   a. No, there is a side length with 2 areas paired with it.
   b. No, there are no negative area values.
   c. No, one side length is equal to the area value.
   d. Yes, each side length is paired with only one value for the area.

***Which set of ordered pairs are solutions to the following function?***

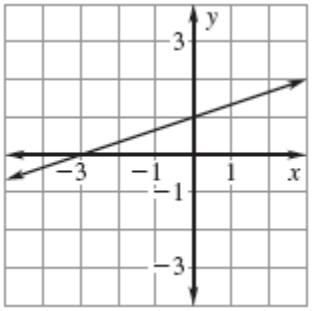
9. $y = -3x - 6$

   a. $\{(-4, 3), (-7, 15), (5, -24), (-6, 12)\}$
   b. $\{(-4, 6), (-7, 15), (5, -21), (-6, 12)\}$
   c. $\{(-4, 6), (-6, 15), (5, -21), (-7, 12)\}$
   d. $\{(4, 6), (-7, 15), (5, 3), (-4, 12)\}$

**Math 6/7 Homework (9.3)**

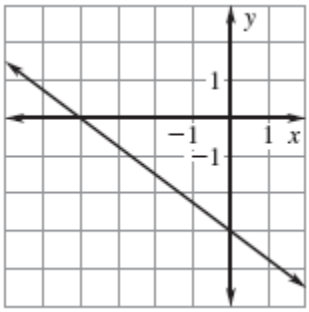
**Identify the x-intercept and the y-intercept of the graph.**

**1.**



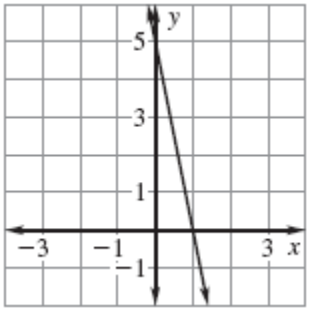

x-int: _____ ; y-int: _____

**2.**




x-int: _____ ; y-int: _____

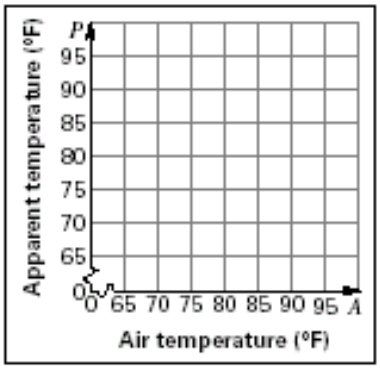
**3.**




x-int: _____ ; y-int: _____

**4.** The table shows the apparent temperature *P* °F, as it feels to your body, as a function of the real air temperature *A*°F when there is 10% humidity. Graph the function.

| Air temperature (°F), *A* | 70 | 75 | 80 | 85 | 90 | 95 |
|---|---|---|---|---|---|---|
| Apparent temperature (°F), *P* | 65 | 70 | 75 | 80 | 85 | 90 |




Rule of the function: P = _____

**Find each function value.**

**5.** $f(2)$ if $f(x) = x + 4$

$f(2)$ =

**6.** $f(9)$ if $f(x) = x - 8$

$f(9)$ =

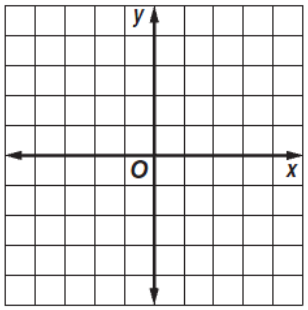
**7.** $f(3)$ if $f(x) = 2x + 2$

$f(3)$ =

**Graph each function.**

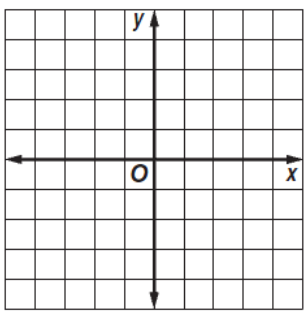
**8**. f(x) = 2x

| x | 2x | (x,f(x)) |
|---|---|---|
| | | |
| | | |
| | | |



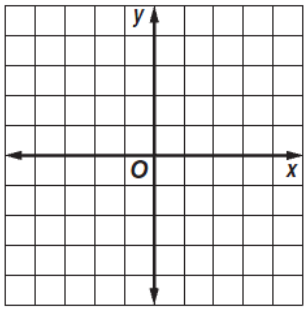

**9**. f(x) = –3x

| x | –3x | (x,f(x)) |
|---|---|---|
| | | |
| | | |
| | | |




**10.** f(x) = x – 4

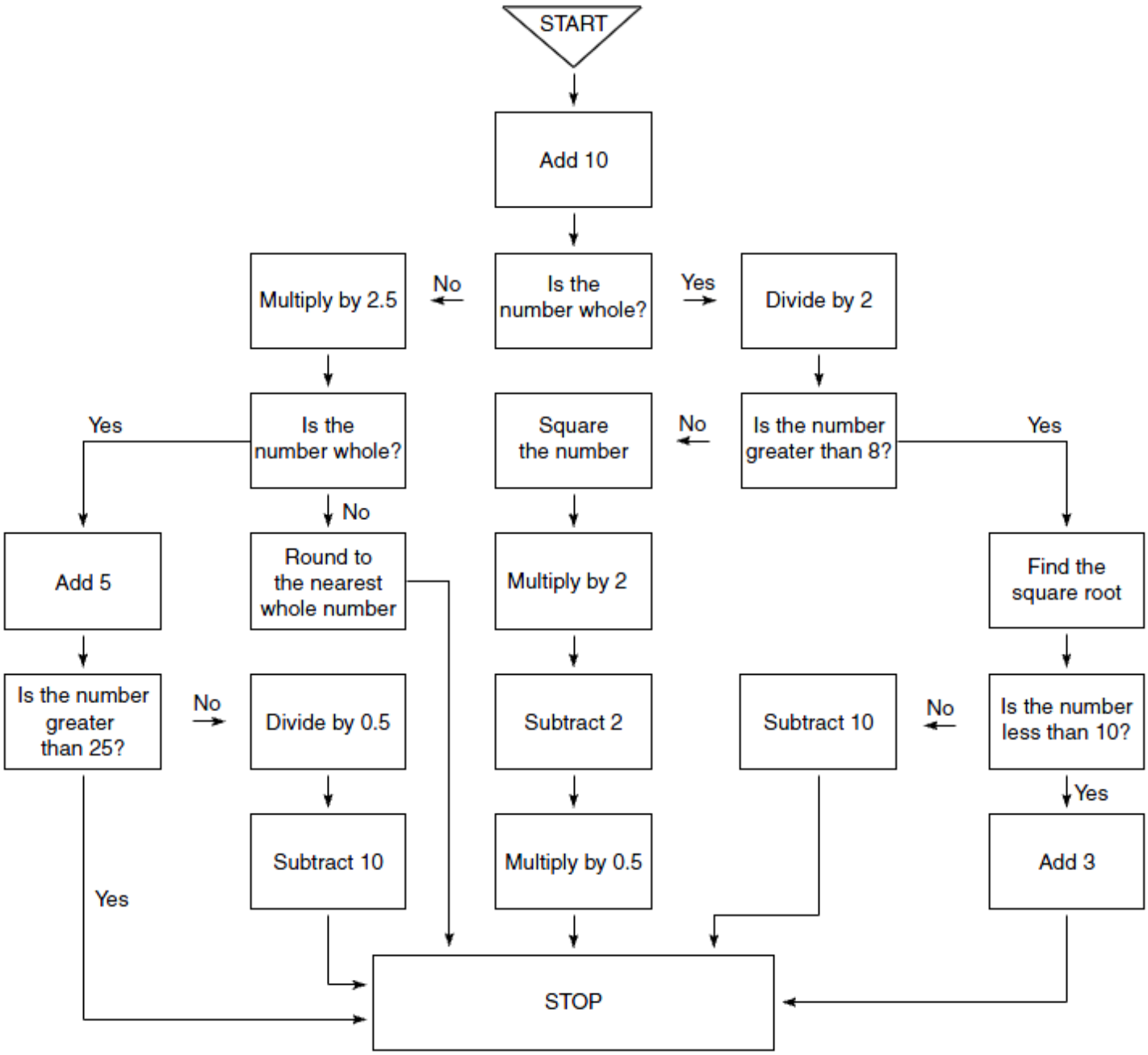
| x | f(x) |
|---|---|
| | |
| | |
| | |



**Math 6/7 Enrichment (9.3)**

A function flowchart and ten numbers are given below.
Input each number into the flowchart at the place marked START, then follow the number through the flowchart.
When you reach the place marked STOP, record the output number.

| Input $n$ | 4 | 790 | $-1.2$ | 1 | 0.2 | $-6.8$ | 278 | 88 | $-5.2$ | 0 |
|---|---|---|---|---|---|---|---|---|---|---|
| Output $f(n)$ | | | | | | | | | | |



NAME _____ DATE _____ PERIOD _____

# 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** $y = x + 1$, $y = -2x$, $y = \frac{1}{3}x$

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

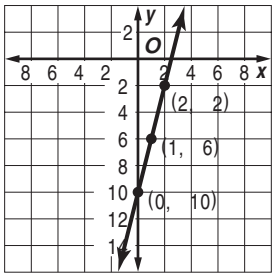
Solutions of a linear equation are ordered pairs that make the equation true. One way to find solutions is to make a table.

**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.**

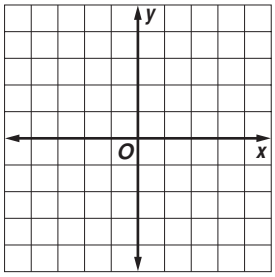
**1.** $y = 2x + 4$

**2.** $y = -3x - 7$

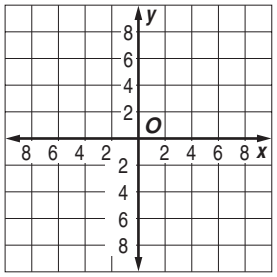
**3.** $4x + y = 5$

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

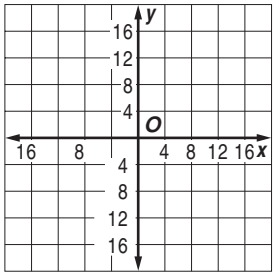
**4.** $y = -4x$




**5.** $y = x + 6$




**6.** $-2x + y = 8$



NAME _____ DATE _____ PERIOD _____

# 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.** $y = -3x + 1$

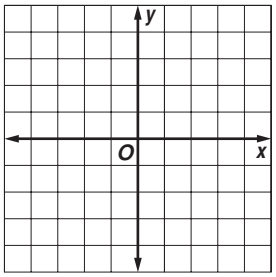
**4.** $x - y = 6$

**5.** $y = 2x + 4$

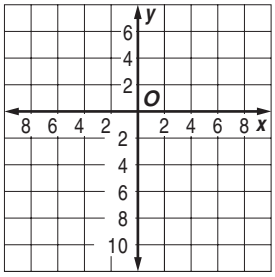
**6.** $7x - y = 14$

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

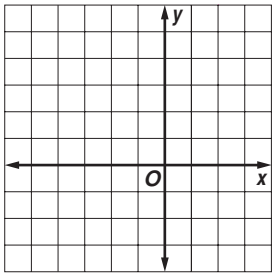
**7.** $y = 2x - 1$



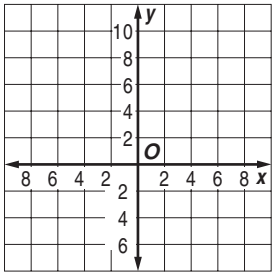

**8.** $y = -6x + 2$



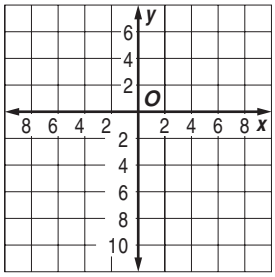

**9.** $y = x + 4$



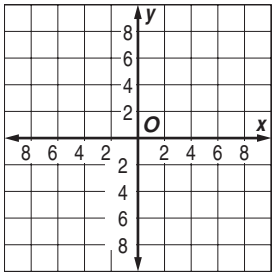

**10.** $y = 7$




**11.** $y = 3x - 9$




**12.** $y = \frac{1}{2}x - 6$



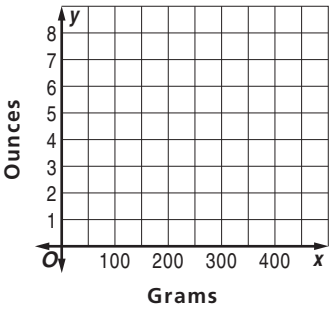

**COOKING For Exercises 13–15, use the following information.**

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.



NAME _____ DATE _____ PERIOD _____

# 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.** $y = \frac{x}{4}$

| x | y |
|---|---|
| 8 | |
| | 4 |
| | −6 |

**6.** $y = -6x + 1$

| x | y |
|---|---|
| 1 | |
| | −11 |
| | 13 |

**7.** $y = 9 - 2x$

| x | y |
|---|---|
| 3 | |
| | 7 |
| | 1 |

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

| x | y |
|---|---|
| 4 | |
| | 4 |
| | −1 |

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

| 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 |

| Area of a Square | |
|---|---|
| Side Length (cm) | Area ($cm^2$) |
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |
| 5 | 25 |

7. Describe how the area of a square is related to the length of the side.
   a. As the length of the side increases, the area decreases.
   b. As the length of the side increases, the area increases and then decreases.
   c. As the length of the side increases, the area increases.
   d. As the length of the side increases, the area decreases and then increases.

8. Is the relation (side length, area) a function? Explain.
   a. No, there is a side length with 2 areas paired with it.
   b. No, there are no negative area values.
   c. No, one side length is equal to the area value.
   d. Yes, each side length is paired with only one value for the area.

**12. Flower Garden** You have a flat of 12 plants that you are planting in a garden.

**a.** Copy and complete: Each time you put one plant in the garden, you have one less plant in the flat, so __?__ is a function of __?__.

**b.** Write a rule for the number of plants $y$ you have left in the flat as a function of the number of plants $x$ you have put in the garden so far.

**c.** Make a table and identify the range of the function.

**13. Centerpieces** A florist is making centerpieces for a charity event. She is using 9 flowers in each centerpiece. Write a rule for the total number of flowers used as a function of the number of centerpieces created.

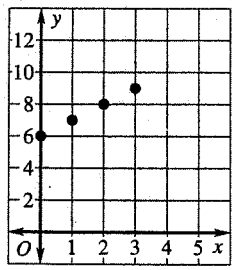
**14. Kickboxing** You join a kickboxing class at a local gym. The cost is $5 per class plus $25 for the initial membership fee. Write a rule for the total cost of the class in dollars as a function of the number of classes you attend. How much will it cost if you go to 8 classes?

**Match the rule for the function with its graph.**

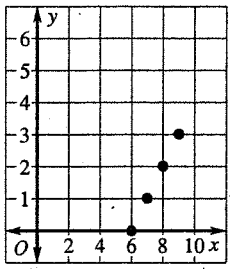
**15.** $y = 6x$ **16.** $y = 6x - 1$ **17.** $y = x + 6$

**18.** $y = \frac{1}{6}x$ **19.** $y = x - 6$ **20.** $y = 6x + 1$

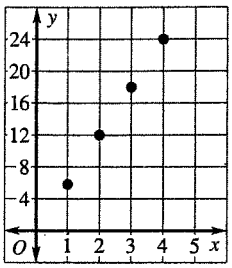
**A.**



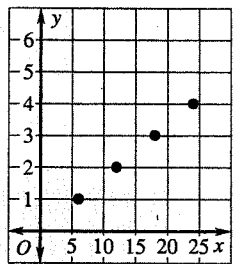

**B.**



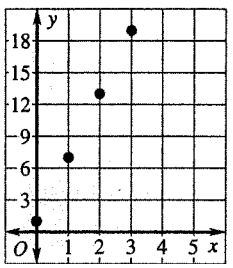

**C.**



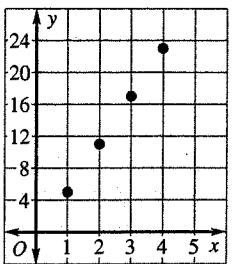

**D.**




**E.**




**F.**



NAME _____ DATE _____ PERIOD _____

# 8-3 Study Guide and Intervention

## *Graphing Linear Equations Using Intercepts*

| Finding Intercepts | |
|---|---|
| The $x$-intercept is the $x$-coordinate of a point where a graph crosses the $x$-axis. The y-coordinate of this point is 0. | To find the $x$-intercept, let $y = 0$ in the equation and solve for $x$. |
| The $y$-intercept is the $y$-coordinate of a point where a graph crosses the $y$-axis. The $x$-coordinate of this point is 0. | To find the $y$-intercept, let $x = 0$ in the equation and solve for $y$. |

**Example 1** **Find the $x$-intercept and the $y$-intercept for the graph of $2x + 5y = 10$.**

To find the $x$-intercept, let $y = 0$.

$2x + 5y = 10$ Write the equation.

$2x + 5(0) = 10$ Replace $y$ with 0.

$x = 5$ Simplify.

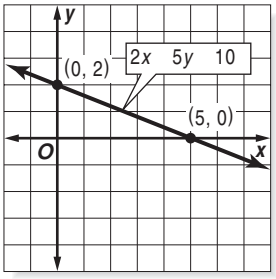
To find the $y$-intercept, let $x = 0$.

$2x + 5y = 10$ Write the equation.

$2(0) + 5y = 10$ Replace $x$ with 0.

$y = 2$ Simplify.

**Example 2** **Graph $2x + 5y = 10$.**




### Exercises

**Find the $x$-intercept and the $y$-intercept for the graph of each equation.**

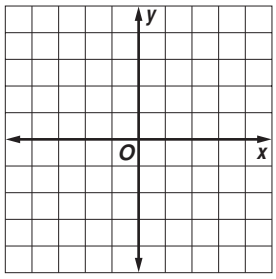
**1.** $y = x - 5$

**2.** $y - 1 = 0$

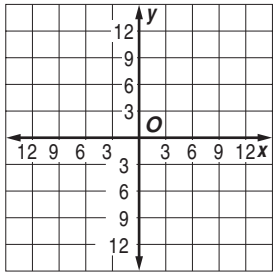
**3.** $3x - 2y = 12$

**Graph each equation using the $x$- and $y$-intercepts.**

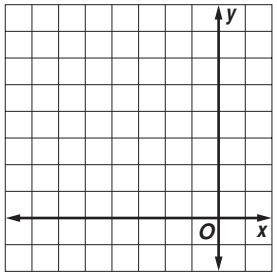
**4.** $y = -3x - 3$




**5.** $y = x + 5$




**6.** $y = -x + 9$




Lesson 8-3

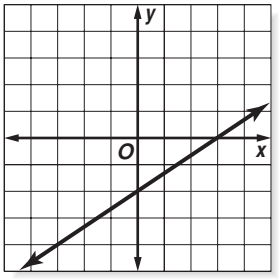
NAME _____ DATE _____ PERIOD _____

# 8-3 Skills Practice

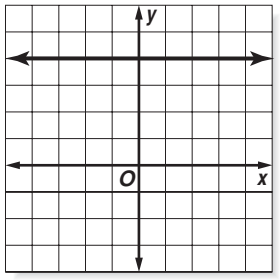
## *Graphing Linear Equations Using Intercepts*

**State the *x*-intercept and the *y*-intercept of each line.**

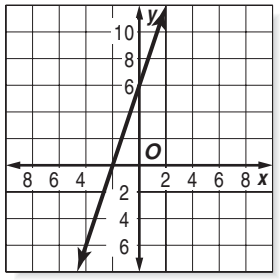
**1.**




**2.**




**3.**




**Find the *x*-intercept and the *y*-intercept for the graph of each equation.**

**4.** $y = 2x + 6$

**5.** $3x - 5y = 30$

**6.** $y = -4x + 8$

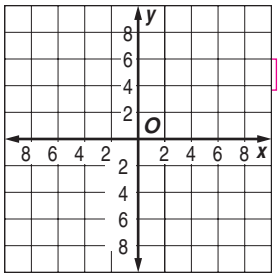
**7.** $y = 7x - 14$

**8.** $y = 12x + 6$

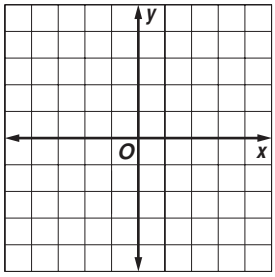
**9.** $y = 7$

**Graph each equation using the *x*- and *y*-intercepts.**

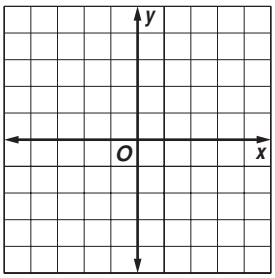
**10.** $y = -2x + 6$



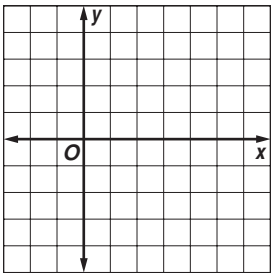

**11.** $y = -2$



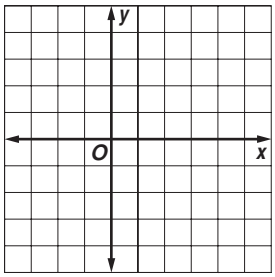

**12.** $y = -4x + 2$



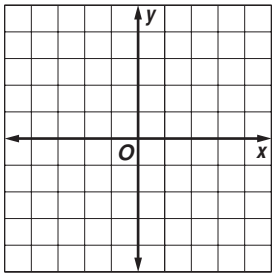

**13.** $y = \frac{2}{5}x - 2$




**14.** $x = 4$




**15.** $y = -x + 3$



NAME _____ DATE _____ PERIOD _____

# 8-3 Practice

## *Graphing Linear Equations Using Intercepts*

**Find the *x*-intercept and the *y*-intercept for the graph of each equation.**

**1.** $y = 2x - 2$

**2.** $y + 4 = 0$

**3.** $y = 3x + 9$

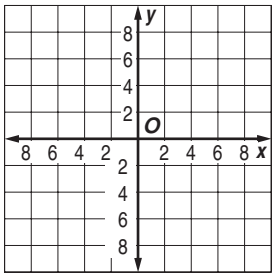
**4.** $6x + 12y = 24$

**5.** $5x - 3y = 15$

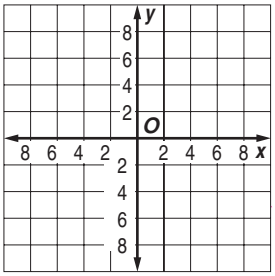
**6.** $-x - 7 = 0$

**Graph each equation using the *x*- and *y*-intercepts.**

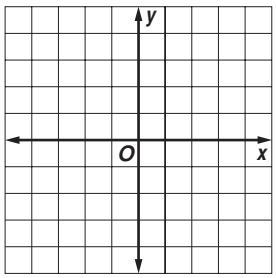
**7.** $y = x - 7$



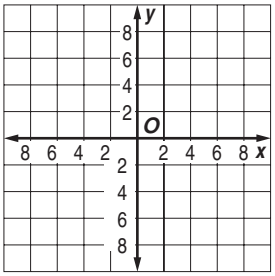

**8.** $y = -x + 5$



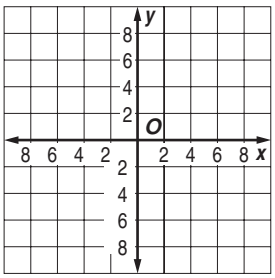

**9.** $y = 2x - 4$



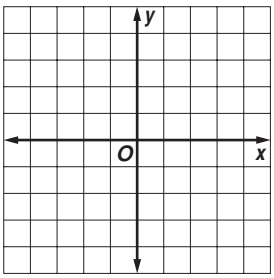

**10.** $y = -\frac{1}{7}x - 1$



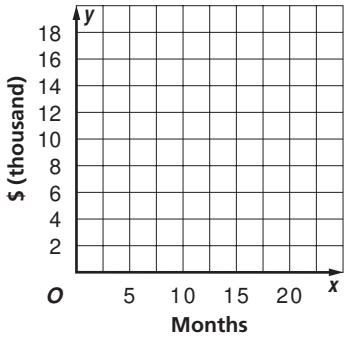

**11.** $5x + 2y = 10$




**12.** $x = 2$




**13. SAVINGS** Rashid's grandparents started a savings account for him, contributing $1000. He deposits $430 each month into the account. The equation $y = 430x + 1000$ represents how much money is in the savings account after $x$ number of months. Graph the equation and explain what the $y$-intercept means.




Lesson 8-3