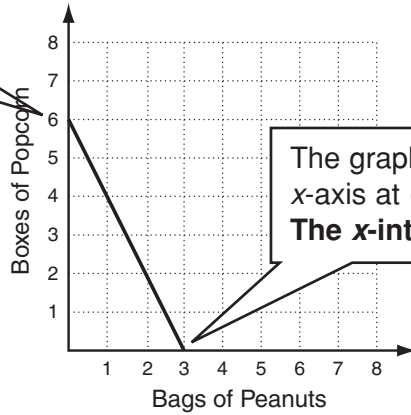


LESSON
5-2 **Reteach**
Using Intercepts

The **x-intercept** is the x-coordinate of the point where the graph intersects the x-axis.
The **y-intercept** is the y-coordinate of the point where the graph intersects the y-axis.

At a baseball game, Doug has \$12 to spend on popcorn and peanuts. The peanuts are \$4 and the popcorn is \$2. The function $4x + 2y = 12$ describes the amount of peanuts x and popcorn y he can buy if he spends all his money. The function is graphed below. Find the intercepts. What does each intercept represent?

The graph crosses the y-axis at (0, 6).
The y-intercept is 6.

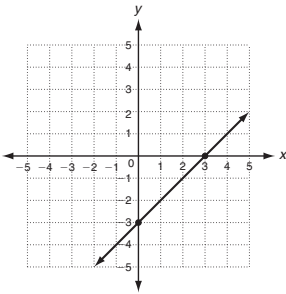


The graph crosses the x-axis at (3, 0).
The x-intercept is 3.

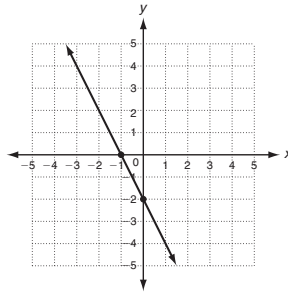
The x-intercept 3 is the amount of peanuts Doug can buy if he buys no popcorn.
The y-intercept 6 is the amount of popcorn Doug can buy if he buys no peanuts.

Find the x- and y-intercepts.

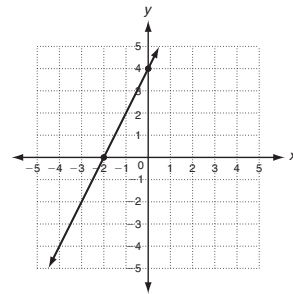
1.



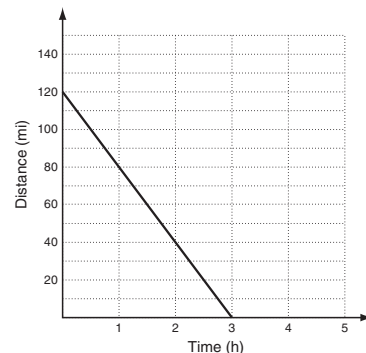
2.



3.



4. The volleyball team is traveling to a game 120 miles away. Their average speed is 40 mi/h. The graphed line describes the distance left to travel at any time during the trip. Find the intercepts. What does each intercept represent?



LESSON

Reteach

5-2 Using Intercepts (continued)

You can find the x - and y -intercepts from an equation. Then you can use the intercepts to graph the equation.

Find the x - and y -intercepts of $4x + 2y = 8$.

To find the x -intercept, substitute 0 for y .

$$4x + 2y = 8$$

$$4x + 2(0) = 8$$

$$4x = 8$$

$$\frac{4x}{4} = \frac{8}{4}$$

$$x = 2$$

The x -intercept is 2.

To find the y -intercept, substitute 0 for x .

$$4x + 2y = 8$$

$$4(0) + 2y = 8$$

$$2y = 8$$

$$\frac{2y}{2} = \frac{8}{2}$$

$$y = 4$$

The y -intercept is 4.

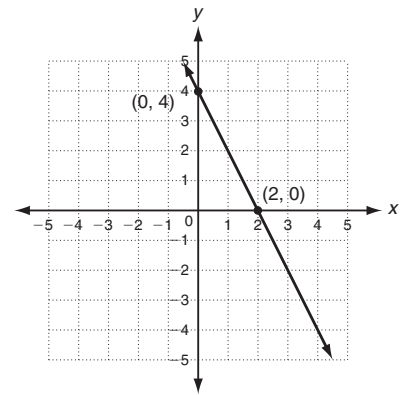
Use the intercepts to graph the line described by $4x + 2y = 8$.

Because the x -intercept is 2, the point $(2, 0)$ is on the graph.

Because the y -intercept is 4, the point $(0, 4)$ is on the graph.

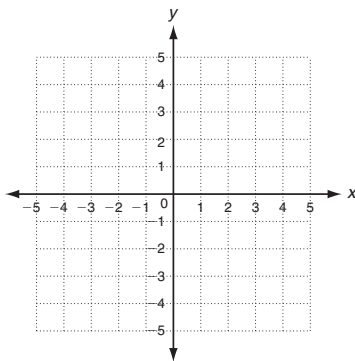
Plot $(2, 0)$ and $(0, 4)$.

Draw a line through both points.

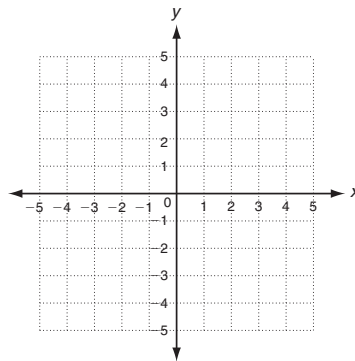


Use intercepts to graph the line described by each equation.

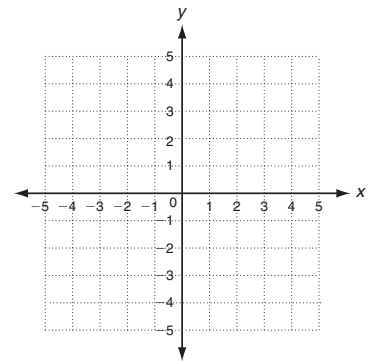
5. $3x + 9y = 9$



6. $4x + 6y = -12$

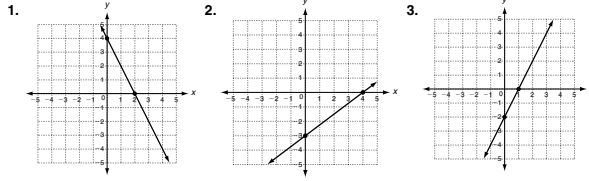


7. $2x - y = 4$



LESSON **Practice A**
5-2 **Using Intercepts**

Find the x - and y -intercepts.



1. x -intercept: 2 y -intercept: 4
2. x -intercept: 4 y -intercept: -3
3. x -intercept: 1 y -intercept: -2

4. Find the intercepts of $2x + 3y = 6$ by following the steps below.

a. Substitute $y = 0$ into the equation. Solve for x .

$x = 3$

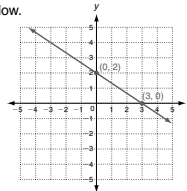
b. The x -intercept is: 3

c. Substitute $x = 0$ into the equation. Solve for y .

$y = 2$

d. The y -intercept is: 2

e. Use the intercepts to graph the line described by the equation.



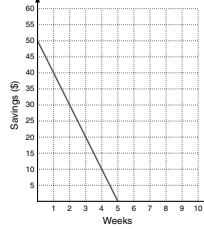
5. Jennifer started with \$50 in her savings account. Each week she withdrew \$10. The amount of money in her savings account after x weeks is represented by the function $f(x) = 50 - 10x$.

a. Find the intercepts and graph the function.

x -int: 5; y -int: 50

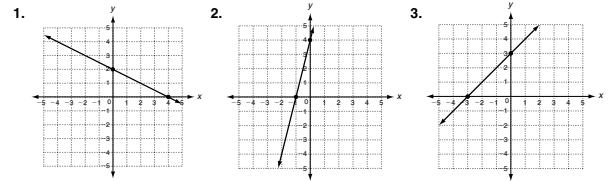
b. What does each intercept represent?

x -int: the amount of money after 5 weeks. y -int: the amount of money before she makes any withdrawals



LESSON **Practice B**
5-2 **Using Intercepts**

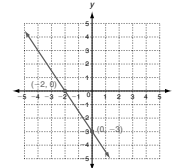
Find the x - and y -intercepts.



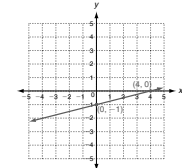
1. x -int: 4 y -int: 2
2. x -int: -1 y -int: 4
3. x -int: -3 y -int: 3

Use intercepts to graph the line described by each equation.

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



5. $x - 4y = 4$

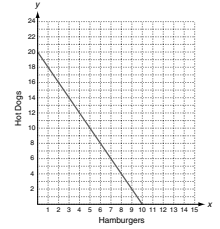


6. At a fair, hamburgers sell for \$3.00 each and hot dogs sell for \$1.50 each. The equation $3x + 1.5y = 30$ describes the number of hamburgers and hot dogs a family can buy with \$30.

a. Find the intercepts and graph the function.

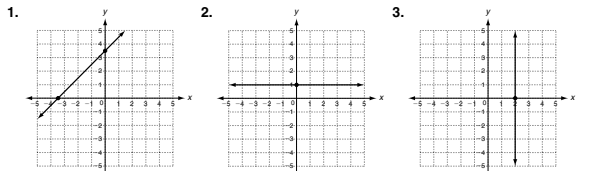
x -int: 10; y -int: 20

b. What does each intercept represent?
 x -int: the number of hamburgers they can buy if they buy no hot dogs.
 y -int: the number of hot dogs they can buy if they buy no hamburgers.



LESSON **Practice C**
5-2 **Using Intercepts**

Find the x - and y -intercepts.

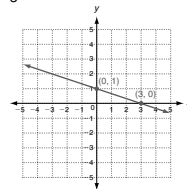
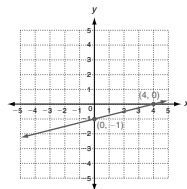


1. x -int: -3.5 y -int: 3.5
2. x -int: none y -int: 1
3. x -int: 2 y -int: none

Use intercepts to graph the line described by each equation.

4. $y = 0.25x - 1$

5. $\frac{1}{3}x + y = 1$



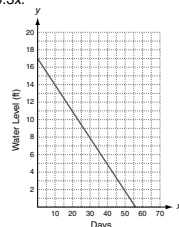
6. The change in water level of one portion of the Mississippi River is about -0.3 ft per day. If the water level starts at 17 feet and falls for x days, the level is represented by the function $f(x) = 17 - 0.3x$.

a. Find the intercepts and graph the function.

x -int: 56 $\frac{2}{3}$; y -int: 17

b. What does each intercept represent?

x -int: the number of days it will take for the river to run dry.
 y -int: the water level before it falls.

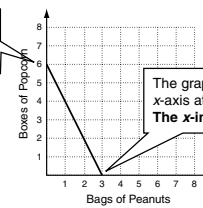


LESSON **Reteach**
5-2 **Using Intercepts**

The x -intercept is the x -coordinate of the point where the graph intersects the x -axis. The y -intercept is the y -coordinate of the point where the graph intersects the y -axis.

At a baseball game, Doug has \$12 to spend on popcorn and peanuts. The peanuts are \$4 and the popcorn is \$2. The function $4x + 2y = 12$ describes the amount of peanuts x and popcorn y he can buy if he spends all his money. The function is graphed below. Find the intercepts. What does each intercept represent?

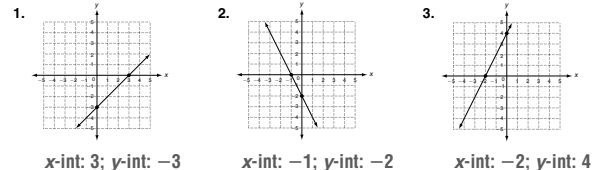
The graph crosses the y -axis at $(0, 6)$.
The y -intercept is 6.



The graph crosses the x -axis at $(3, 0)$.
The x -intercept is 3.

The x -intercept 3 is the amount of peanuts Doug can buy if he buys no popcorn. The y -intercept 6 is the amount of popcorn Doug can buy if he buys no peanuts.

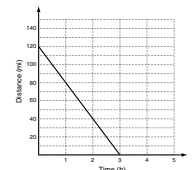
Find the x - and y -intercepts.



1. x -int: 3; y -int: -3 2. x -int: -1; y -int: -2 3. x -int: -2; y -int: 4

4. The volleyball team is traveling to a game 120 miles away. Their average speed is 40 mi/h. The graphed line describes the distance left to travel at any time during the trip. Find the intercepts. What does each intercept represent?

x -int: 3; the time it took to complete the trip.
 y -int: 120; the number of miles left to driven.



LESSON **Reteach**

5-2 Using Intercepts (continued)

You can find the x - and y -intercepts from an equation. Then you can use the intercepts to graph the equation.

Find the x - and y -intercepts of $4x + 2y = 8$.

To find the x -intercept, substitute 0 for y .

$$\begin{aligned} 4x + 2y &= 8 \\ 4x + 2(0) &= 8 \\ 4x &= 8 \\ \frac{4x}{4} &= \frac{8}{4} \\ x &= 2 \end{aligned}$$

To find the y -intercept, substitute 0 for x .

$$\begin{aligned} 4x + 2y &= 8 \\ 4(0) + 2y &= 8 \\ 2y &= 8 \\ \frac{2y}{2} &= \frac{8}{2} \\ y &= 4 \end{aligned}$$

The x -intercept is 2.

The y -intercept is 4.

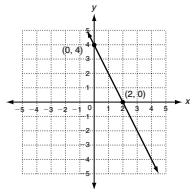
Use the intercepts to graph the line described by $4x + 2y = 8$.

Because the x -intercept is 2, the point (2, 0) is on the graph.

Because the y -intercept is 4, the point (0, 4) is on the graph.

Plot (2, 0) and (0, 4).

Draw a line through both points.

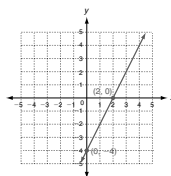
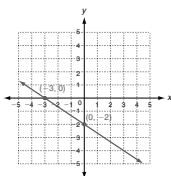
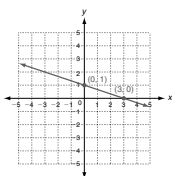


Use intercepts to graph the line described by each equation.

5. $3x + 9y = 9$

6. $4x + 6y = -12$

7. $2x - y = 4$



LESSON **Challenge**

5-2 Intercepts and Perimeters

You can use the **distance formula** to find the distance between two ordered pairs.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

where (x_1, y_1) represent the x and y of the first ordered pair and (x_2, y_2) represent the x and y of the second ordered pair.

Find the distance between the ordered pairs. Round your answer to the nearest tenth.

1. (3, 0) and (0, 5)

2. (-4, 0) and (0, 2)

≈ 5.8 units

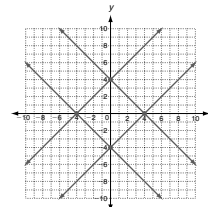
≈ 4.5 units

Find the x - and y -intercepts of each equation. Use the intercepts to graph the equations on the same grid. Then find the perimeter of the geometric figure formed by the lines. Round all distances to the nearest tenth.

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

x -int: -4
 x -int: 4
 x -int: 4
 x -int: -4

y -int: 4
 y -int: -4
 y -int: 4
 y -int: -4

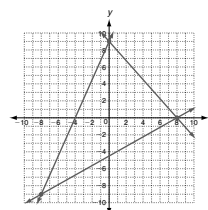


Perimeter: ≈ 22.6 units

4. $8y + 9x = 72$
 $4y - 9x = 36$
 $16y - 9x = -72$

x -int: 8
 x -int: -4
 x -int: 8

y -int: 9
 y -int: 9
 y -int: -4.5



Perimeter: ≈ 50.1 units

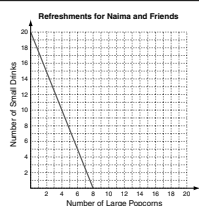
LESSON **Problem Solving**

5-2 Using Intercepts

Write the correct answer.

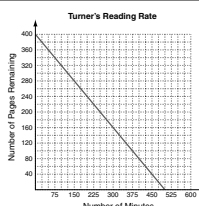
1. Naima has \$40 to spend on refreshments for herself and her friends at the movie theater. The equation $5x + 2y = 40$ describes the number of large popcorns x and small drinks y she can buy. Graph this function and find its intercepts.

y -int: 20; x -int: 8



2. Turner is reading a 400-page book. He reads 4 pages every 5 minutes. The number of pages Turner has left to read after x minutes is represented by the function $f(x) = 400 - \frac{4}{5}x$. Graph this function and find its intercepts.

y -int: 400; x -int: 500

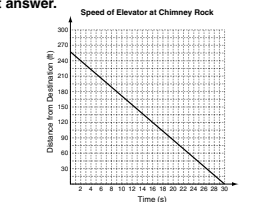


The graph shows the distance of an elevator at Chimney Rock, North Carolina, from its destination as a function of time. Use the graph to answer questions 3–6. Select the best answer.

3. What is the x -intercept of this function?
 A 0 C 258
 B 30 D 300

4. What does the x -intercept represent?
 F the total distance the elevator travels
 G the number of seconds that have passed for any given distance
 H the number of seconds it takes the elevator to reach its destination
 J the distance that the elevator has traveled at any given time

5. What is the y -intercept for this function?
 A 0 C 258
 B 30 D 300

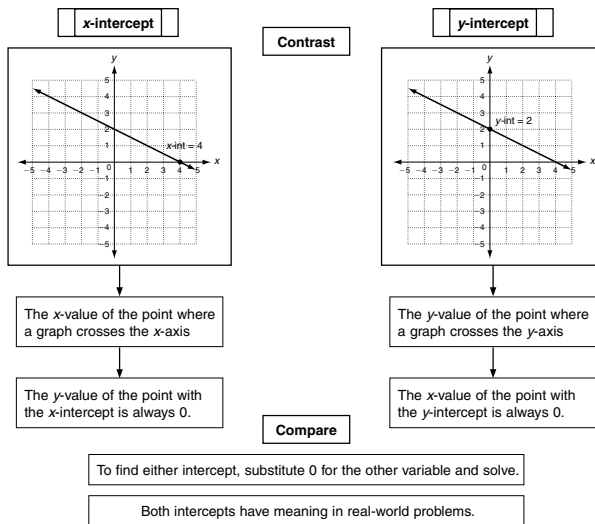


6. What does the y -intercept represent?
 F the total distance the elevator travels
 G the number of seconds that have passed for any given distance
 H the number of seconds it takes the elevator to reach its destination
 J the distance that the elevator has traveled at any given time

LESSON **Reading Strategies**

5-2 Compare and Contrast

Study the chart below to compare and contrast x - and y -intercepts.

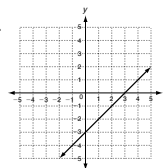


Find the x - and y -intercepts.

1. $3x - 2y = 6$

2.

3. The graph intersects the two axes at $(-3, 0)$ and $(0, 5)$.



x -int: 2; y -int: -3

x -int: 3; y -int: -3

x -int: -3; y -int: 5