pp. 246-247 #4-7, 10-15, 19-22

4. As each input increases by 1, the output increases by 6.
20; 26; 32

5. As each input increases by 1, the output increases by 5.
12; 17; 22

6. (0, 4), (3, 5), (6, 6), (9, 7)

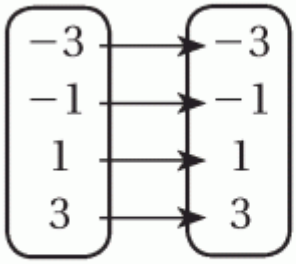
7. (1, 8), (3, 8), (3, 4), (5, 6), (7, 2)

10. yes

11. yes

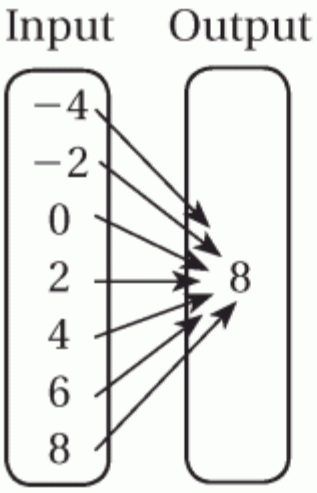
12. In order for a relation to be a function, each input must be paired with exactly one output. So, the relation is not a function.

13. Input Output



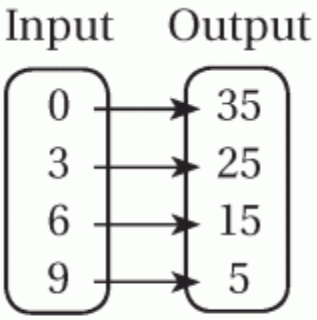
As each input increases by 2, the output increases by 2.

14.



As each input increases by 2, the output is 8.

15.



As each input increases by 3, the output decreases by 10.

19. y-axis

20. x-axis

21. x-axis

22. A

pp. 253-255 #4-5, 8-12, 17-20, 24-25, 33, 39-41

4. $y = 4x$

5. $y = x + 7$

8. $y = x + 11$

9. $y = x - 3$

10. $y = x^3$

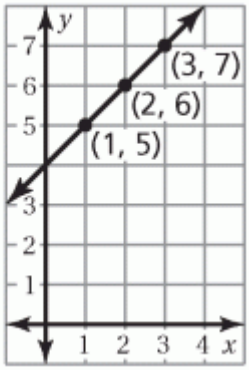
11. $y = 6x$

12. $y = 2x + 1$

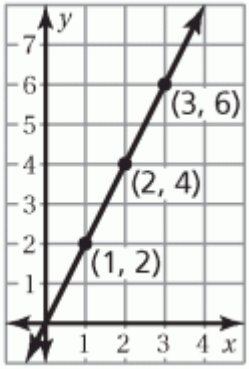
17. 54

18. 3

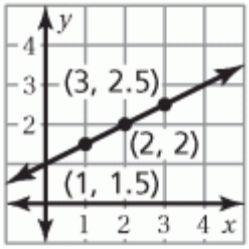
19.



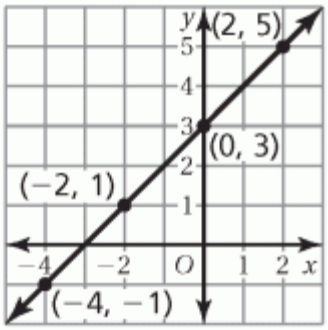
20.



24.



25. The order of the x- and y-coordinates is reversed in each coordinate pair.



33. **a.** $P = 3.50b - 84$

b. independent variable: b; dependent variable: P; The profit depends on the number of bracelets sold.

c. 24 bracelets

39. 1

40. $-\frac{5}{2}$

41. $\frac{1}{3}$

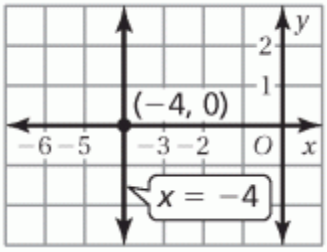
p. 143 #3-5, p. 146 #3-4

3) When it looks like y=mx+b. The graph is a line. (Multiple answers at this point)

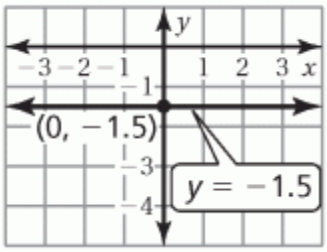
4) a) Yes; No b) Choose a lower minimum y-value

5) Graphing calculator (various answers at this point)

3.

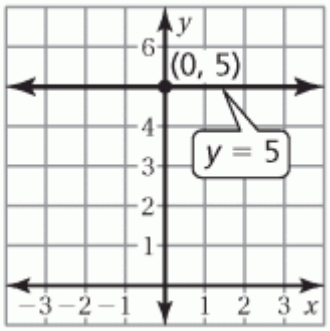


4.

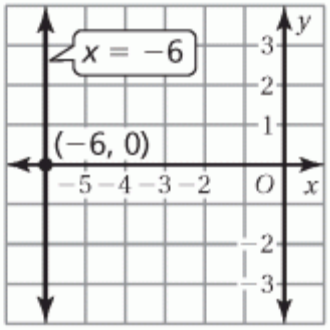


pp. 146-147 #7-9, 11, 17, 19, 28-32

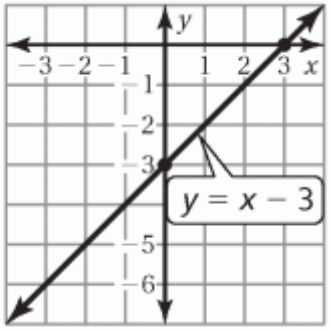
7.



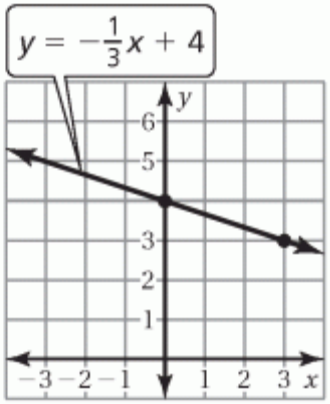
8.



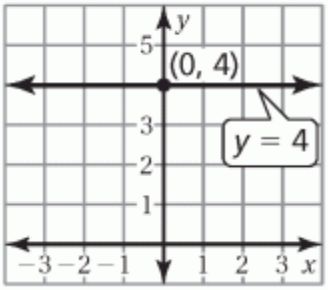
9.



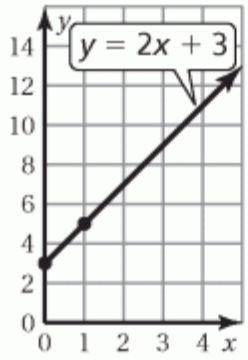
11.



17. The equation $x = 4$ is graphed, not $y = 4$.



19. **a.**



b. about \$5

c. \$5.25

28. (5, 3)

29. (−6, 6)

30. (2, −2)

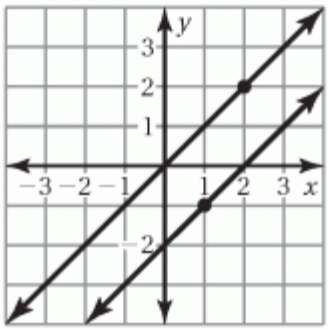
31. (−4, −3)

32. B

p. 149 #4, p. 153 #4-6

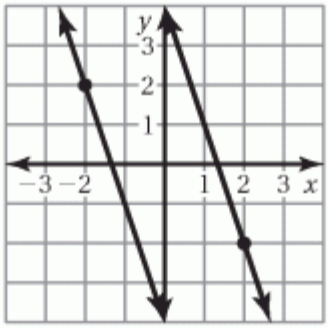
4) (Various Answers)

4.



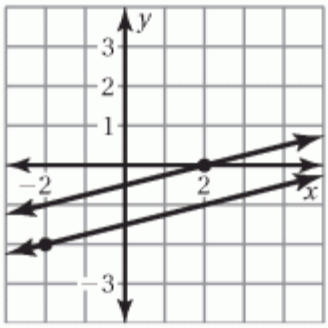
The lines are parallel.

5.



The lines are parallel.

6.



The lines are parallel.

pp. 153-155 #9-14, 16, 19, 22-23, 37-40

4) (Various Answers)

9. $-\frac{3}{5}$

10. $\frac{1}{6}$

11. 0

12. undefined

13. 0

14. undefined

16. 2

19. The denominator should be $2 - 4$.
$m = -1$

22. $\frac{2}{5}$

23. $-\frac{3}{4}$

37. $b = 25$

38. $n = 56$

39. $x = 7.5$

40. B

pp.162-163 #3-9, 15-17

(17 exercises.)

Display Cols

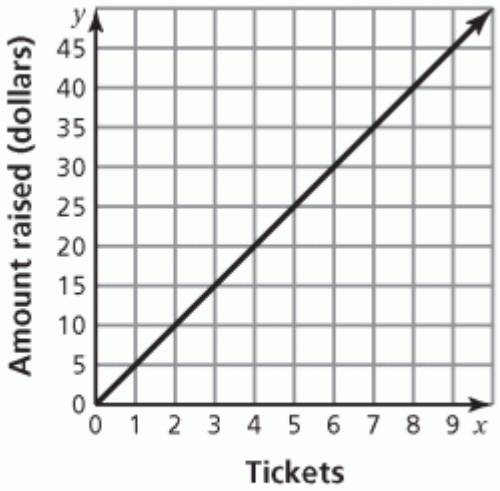
3. no; *Sample answer:* The graph of the equation does not pass through the origin.

4. yes; $y = 4x$; *Sample answer:* The graph is a line through the origin.

5. yes; $y = \frac{1}{3}x$; *Sample answer:* The rate of change in the table is constant.

6. no; *Sample answer:* The rate of change in the table is not constant.

7.



Each ticket costs $5.

8. **a.** $y = 9x$

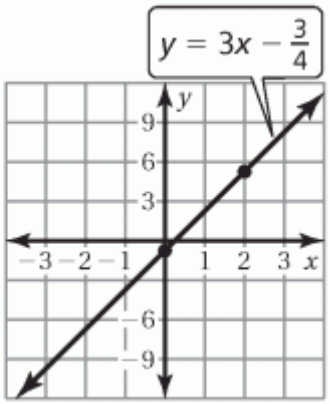
b. It costs $9 per hour to rent a kayak.

c. $45

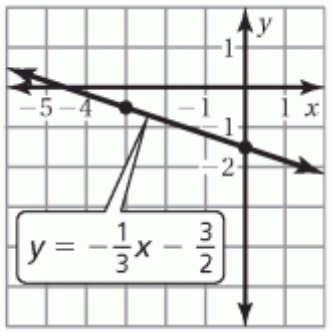
9. **a.** the car; *Sample answer:* The equation for the car is $y = 25x$. Because 25 is greater than 18, the car gets better gas mileage.

b. 56 miles

15.

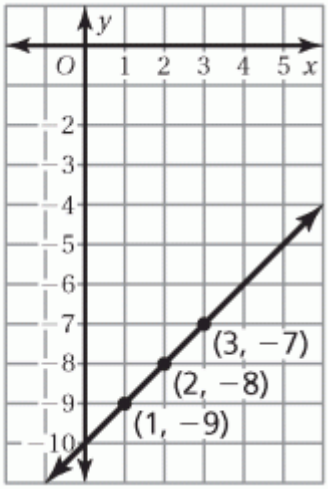


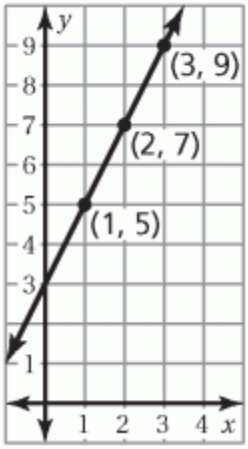
16.

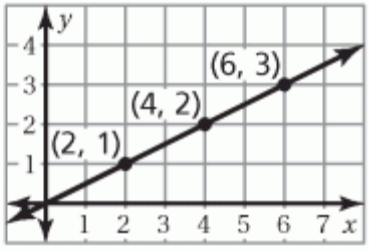


17. B

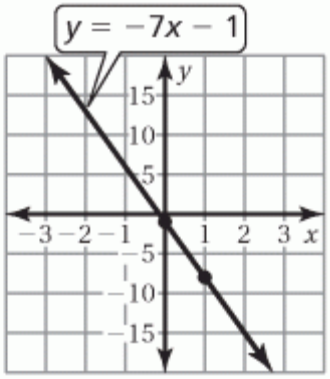
p. 265 (#1-8), p. 146 #10, 14-15, pp. 153-154 #7-8, 15, 17, 21, 24, p. 165 #12-13

1. (10, 0), (20, 0), (30, 10), (40, 5); yes
2. (0, −5), (0, −4), (1, −4), (2, −3), (3, −2); no
3. −30
4. −16
5. 7
6. 

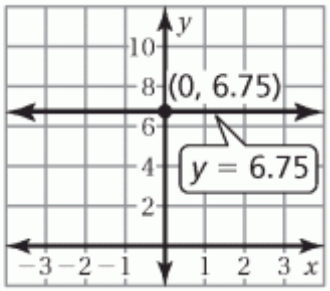
7. 

8. 

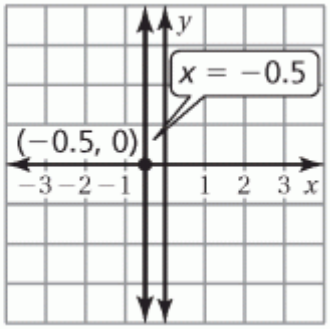
10.



14.



15.



7. $\frac{3}{4}$

8. $-\frac{5}{4}$

15. undefined

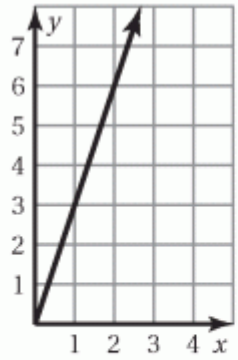
17. $-\frac{11}{6}$

21. 4

24. $-\frac{7}{6}$

Answer Presentation Tool

Book
Chapter

12. 

You take 3 hours of cello lessons per week.

13. **a.** $y = 7.50x$

b. The slope indicates that the unit cost is \$7.50 per guest.

c. \$75

Name: Answers Period: _____

4.1- 4.3 Review

Graph both linear equations on the coordinate plane on the right. Make sure you use an input/output table with at least 3 ordered pairs for each. ***Label the line with the problem number.***

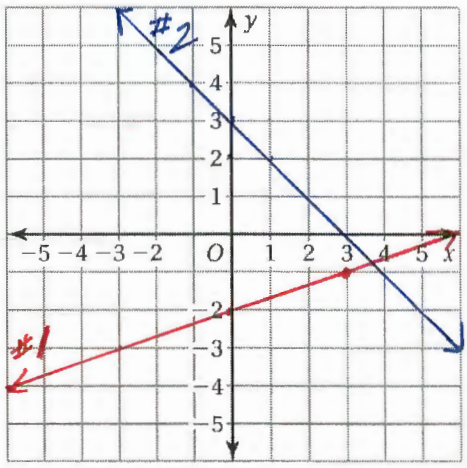
1) $y = \frac{1}{3}x - 2$

x		y
-3	$\frac{1}{3}(-3) - 2$	-3
0	$\frac{1}{3}(0) - 2$	-2
3	$\frac{1}{3}(3) - 2$	-1

2) $y + x = 3$ *(hint: solve for y first)*

$y = -x + 3$

x		y
-1	$-(-1) + 3$	4
0	$-(0) + 3$	3
1	$-(1) + 3$	2



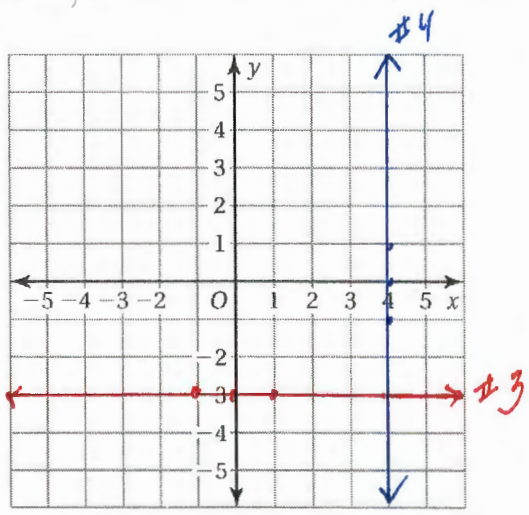
Graph both of the equations on the coordinate plane on the right. You may use an input/output table if you wish.

3) $y = -3$

x	y
-1	-3
0	-3
1	-3

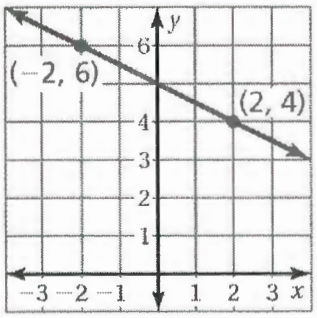
4) $x = 4$

x	y
4	-1
4	0
4	1



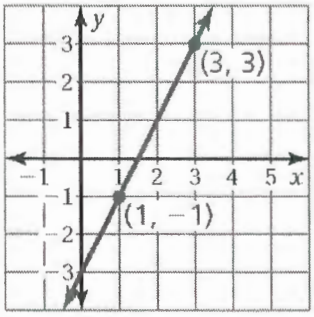
Find the slope of the line in ***simplest form***.

5)

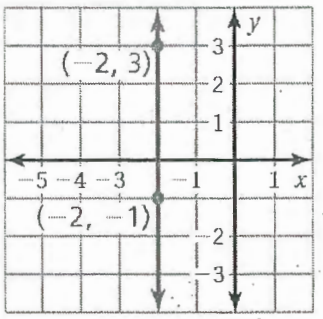


$m =$ $-\frac{1}{2}$

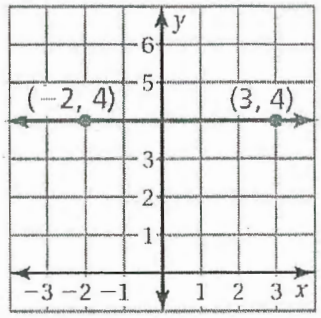
6)



$m =$ $\frac{2}{1}$ or 2

7) 

$m =$ Undefined

8) 

$m =$ 0

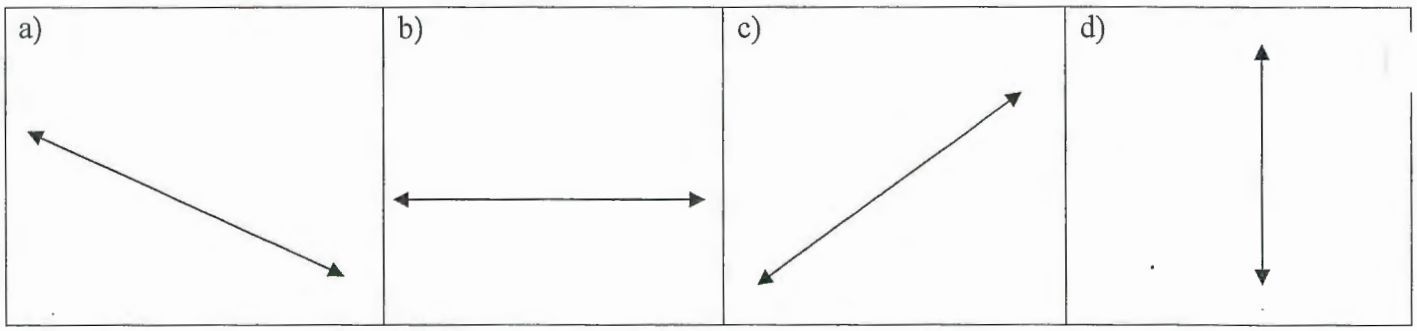
9) What is the slope of the line that is parallel to the line in problem #5. What do we know about the slope of parallel lines?

$m = -\frac{1}{2}$. Parallel lines have the same slope.

10) The slope of any line can be written as a ratio that represents its rise over its run.

11) Match the slope with the line best represented by the slope.

Zero Slope b Positive Slope c Negative Slope a Undefined Slope d



12) Find the slope of the line that passes through the points. Write your answer in simplest form.

$m = \frac{y_2 - y_1}{x_2 - x_1}$

a) (4, 8) and (6, 12) $m =$ 2

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{12-8}{6-4} = \frac{4}{2} = 2$

b) (-4, 9) and (-4, -1) $m =$ Undefined

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{-1-9}{-4--4} = \frac{-10}{0}$

c) (2, 6) and (-8, 4) $m = \frac{1}{5}$

$m = \frac{4-6}{-8-2} = \frac{-2}{-10} = \frac{1}{5}$

d) (-5, -7) and (1, -7) $m =$ 0

$m = \frac{-7--7}{1--5} = \frac{0}{6}$

13) Find the missing coordinate if a line passes through $(-6, -3)$, $(-10, y)$ and has a slope of -2.

$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow -2 = \frac{y--3}{-10--6}$

$-2 = \frac{y+3}{-4}$

$\frac{-2}{1} = \frac{y+3}{-4}$

$y + 3 = 8$

$-3 \quad -3$

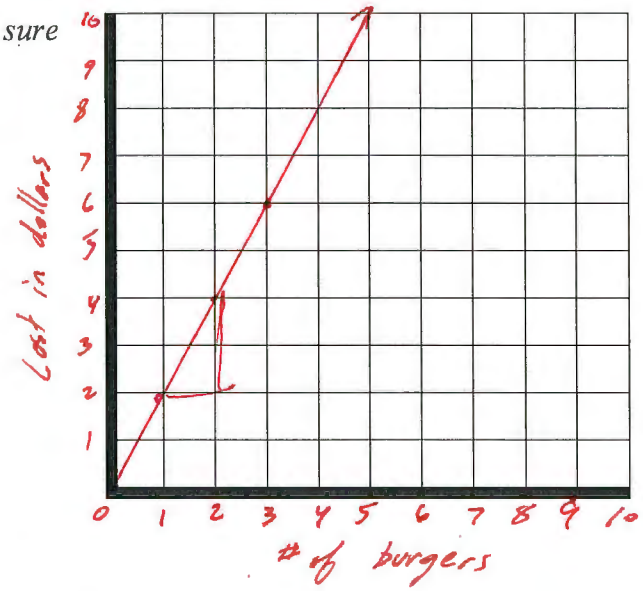
$y = 5$

14) There is a holiday special at In-N-Out today!! The cost y *(in dollars)* for x number of Double-Double burgers you get is represented by the equation $y = 2x$.

a) Graph the equation using at least 4 ordered pairs. *Be sure to label both axis!*

x	y
0	0
1	2
2	4
3	6

$y = 2x$



b) What is the slope of the line? Interpret (explain the meaning of) the slope.

$m =$ $\frac{2}{1}$ or 2

Interpret:

It costs $2 for one hamburger.

15) To make a special Halloween green hair dye, you mix 3 drops of yellow dye (y) for every 6 drops of blue dye (x).

$y = kx$

$3 = k6$

a) Write an equation that represents the situation in simplest form.

$y = \frac{1}{2}x$

b) What is the slope of the line? Interpret the slope. *(what does the slope mean in this situation?)*

$m =$ $\frac{1}{2}$

Interpret: For every 1 drop of yellow, you use 2 drops of blue dye.

c) How many drops of yellow dye would you need if there were 36 drops of blue dye? *(use your equation from part a)*

18 drops of yellow dye.

p. 167 #3-4, p. 170 #4-6

3. A line with slope m that crosses the y-axis at $(0, b)$.

   a. It affects the steepness of the line and whether it rises or falls from left to right.

   b. It affects where the graph crosses the y-axis.

   c. Works for any equation.

4. Because m is the slope and b is the y-intercept.

4. B; slope: 2; y-intercept: 1

5. A; slope: $\frac{1}{3}$; y-intercept: -2

6. C; slope: $-\frac{2}{3}$; y-intercept: 1

pp. 170-171 #7, 13-14, 16-18, 22, 27-31

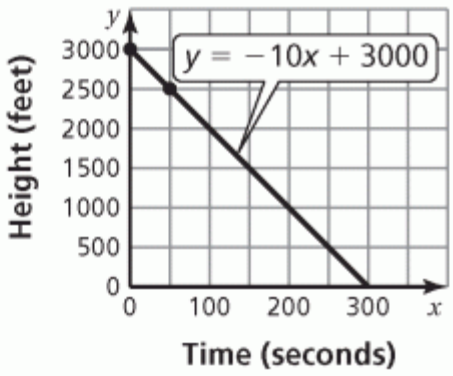
7. slope: 4; y-intercept: -5

13. slope: -2; y-intercept: 3.5

14. slope: $-\frac{1}{2}$; y-intercept: -5

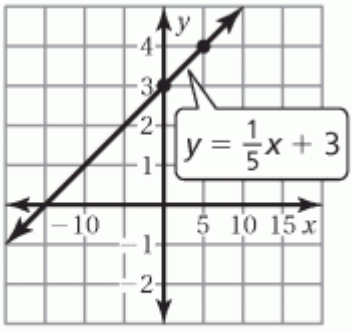
16. The y-intercept should be -3.
$y = 4x - 3$
The slope is 4 and the y-intercept is -3.

17. a.



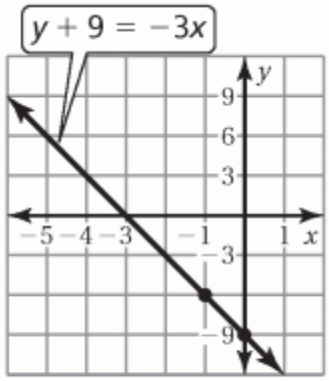
b. The x-intercept of 300 means the skydiver lands on the ground after 300 seconds. The slope of -10 means that the skydiver falls to the ground at a rate of 10 feet per second.

18.



x-intercept: -15

22.



x-intercept: -3

27. $y = 2x + 3$

28. $y = -\frac{4}{5}x + \frac{13}{5}$

29. $y = \frac{2}{3}x - 2$

30. $y = -\frac{7}{4}x + 2$

31. B

p.173 #3-6, p. 176 #3-4

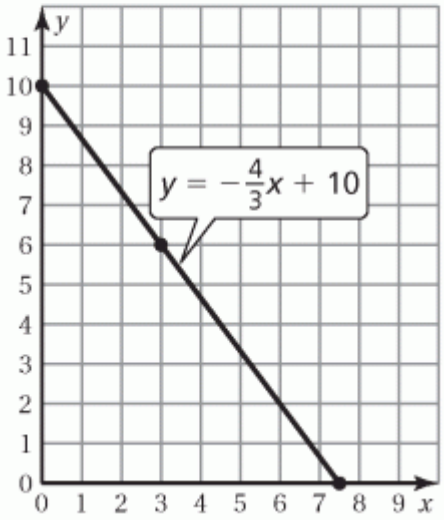
3. *Sample answer:* It is a line with a slope of $\frac{-a}{b}$ and y-intercept of $\frac{c}{b}$.

4. Activity 1 uses a table. Activity 2 uses the slope-intercept form. *Sample answer:* The slope-intercept form may be considered easier because you can use the slope and y-intercept to graph the equation.

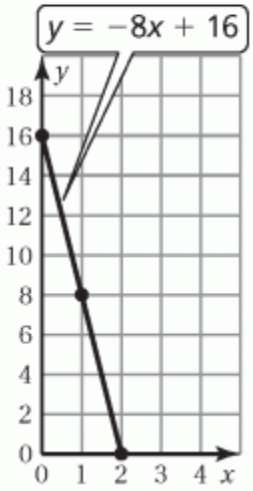
5. *Sample answer:* You sold \$20 worth of lemonade. You sell large cups for \$4 and small cups for \$2.

6. When the equation is in standard form, you can see that when $x = 0$, $y = 10$, and when $y = 0$, $x = 10$. You can graph the equation through its x-intercept and its y-intercept.

3. x = pounds of peaches
y = pounds of apples
$y = -\frac{4}{3}x + 10$



4. x = hours biked
y = hours walked
$y = -8x + 16$



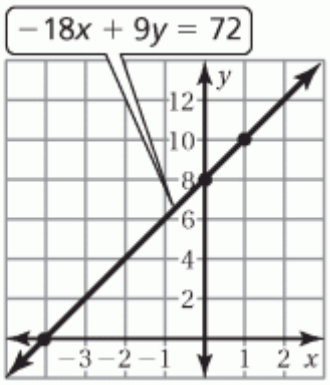
pp. 176-177 #5-9, 11-14,16-17, 20, 24-26

5. $y = -2x + 17$

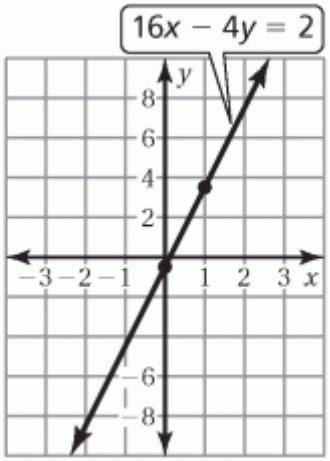
6. $y = 5x - \frac{1}{4}$

7. $y = \frac{1}{2}x + 10$

8.



9.



11. B

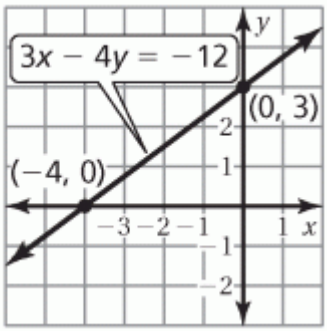
12. A

13. C

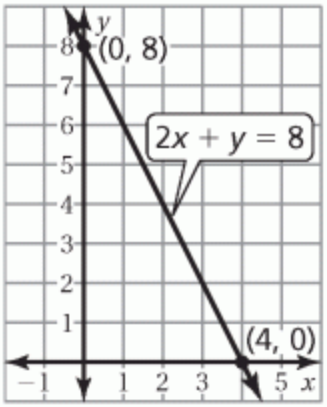
14. They should have let $y = 0$, not $x = 0$.

$$\begin{aligned} -2x + 3y &= 12 \\ -2x + 3(0) &= 12 \\ -2x &= 12 \\ x &= -6 \end{aligned}$$

16.



17.



20. See *Taking Math Deeper.*

24. 4

25. $\frac{1}{2}$

26. D

p. 179 #4-5, p. 182-183 #3-7, 11, 15-17, 24

4. Let the slope be m and the y-intercept be b. Then the equation of the line is $y = mx + b$.

Sample answer: What is the equation of a line with a slope of $\frac{2}{3}$ and y-intercept of 1?

$$y = \frac{2}{3}x + 1$$

5. *Sample answer:* $y = 2x + 5$ and $y = -x + 7$.

3. $y = 3x + 2$;
$y = 3x - 10$;
$y = 5$;
$y = -1$

4. $y = \frac{3}{2}x + 6$;

$y = 3$;

$y = -\frac{3}{2}x + 6$;

$y = \frac{3}{2}x - 6$;

$y = -3$;

$y = -\frac{3}{2}x - 6$

5. $y = x + 4$

6. $y = -2x$

7. $y = \frac{1}{4}x + 1$

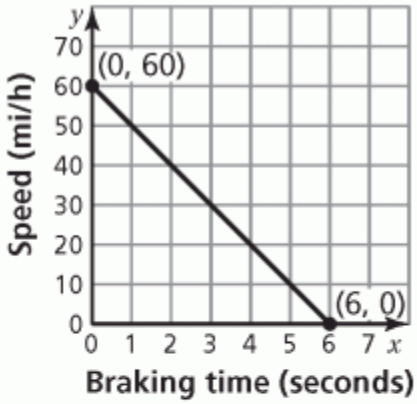
11. The x-intercept was used instead of the y-intercept.

$y = \frac{1}{2}x - 2$

15. $y = -2$

16. $y = 0.7x + 10$

17. a–b.



(0, 60) represents the speed of the automobile before braking. (6, 0) represents the amount of time it takes to stop. The line represents the speed y of the automobile after x seconds of braking.

c. $y = -10x + 60$

24. C

p. 185 #4-6, p. 188 #3-5

4. The results are the same. The formula from Activity 2 can be used to write the equations in slope-intercept form.

5. It is the formula that can be used to write the equation of a line given a "point" on the line and the "slope" of the line. The "slope" and the coordinates of the "point" are substituted into the formula to get the equation. It is important because it allows you to write the equation of a line given a point and a slope.

6. Use the point-slope form of the equation of a line, $y - y_1 = m(x - x_1)$. Substitute the slope form and the point for (x_1, y_1).

Sample answer: Write an equation of the line that passes through the point $(2, -1)$ with slope -2.

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - (-1) &= -2(x - 2) \\ y + 1 &= -2(x - 2) \\ y + 1 &= -2x + 4 \\ y &= -2x + 3 \end{aligned}$$

So, the equation is $y = -2x + 3$.

3. $y - 0 = \frac{1}{2}(x + 2)$

4. $y - 3 = -\frac{3}{4}(x + 4)$

5. $y + 1 = -3(x - 3)$

pp.188-189 #6-8, 12-14, 23, 25-27

6. $y - 0 = -\frac{2}{3}(x - 3)$

7. $y - 8 = \frac{3}{4}(x - 4)$

8. $y + 3 = 4(x - 1)$

12. $y = 3x + 2$

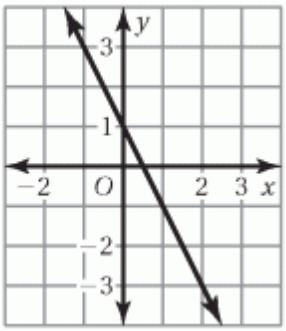
13. $y = 2x$

14. $y = x + 5$

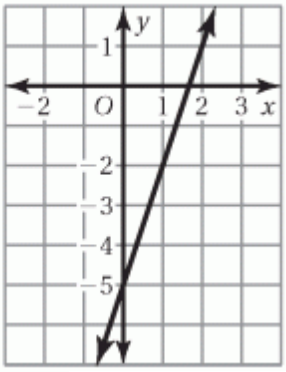
23. **a.** $y = 14x - 108.5$

b. 4 meters

25.



26.



27. D

Name Answers Date

Review 4.1-4.7

Find the slope and the y-intercept of the graph of the linear equation.

1) $y = -4x - 6$

$m =$ -4 $b =$ (0, -6)

2) $y = \frac{1}{2}x - \frac{1}{3}$

$m =$ $\frac{1}{2}$ $b =$ $(0, -\frac{1}{3})$

Find the x-intercept and y-intercepts of the equations

3) $3x - 4y = 24$

(x, 0)
$3x - 4(0) = 24$
$3x = 24$
$x = 8$

(0, y)
$3(0) - 4y = 24$
$-4y = 24$
$y = -6$

x–int: (8, 0) y–int: (0, -6)

4) $-6x + 3y = 12$

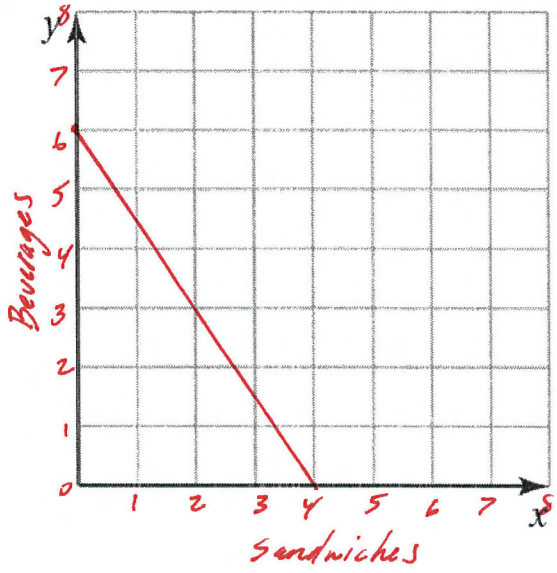
(x, 0)
$-6x + 3(0) = 12$
$-6x = 12$
$x = -2$

(0, y)
$-6(0) + 3y = 12$
$3y = 12$
$y = 4$

x–int: (-2, 0) y–int: (0, 4)

5) You spend \$36 on a meal for you and your friends

a) Graph the equation $9x + 6y = 36$ where x is the number of sandwiches purchased and y is the number of beverages purchased.



b) Interpret the intercepts.

(x, 0)
$9x + 6(0) = 36$
$9x = 36$
$x = 4$
(4, 0)

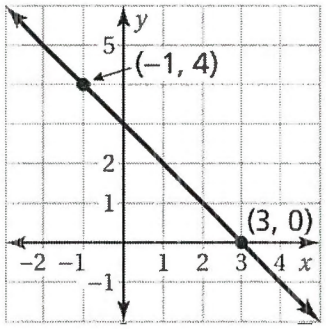
You can buy 4 sandwiches if you buy 0 drinks

(0, y)
$9(0) + 6y = 36$
$6y = 36$
$y = 6$
(0, 6)

You can buy 6 drinks if you buy 0 sandwiches

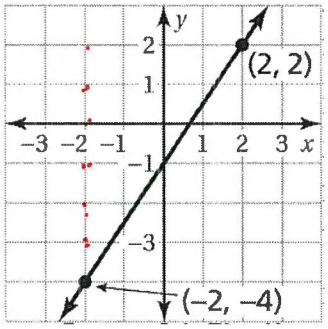
Write an equation of the line in **slope-intercept form**. *(2 pts. each)*

6)



Equation: $y = x + 3$

7)



Equation: $y = \frac{3}{2}x - 1$

Write in **point-slope form** an equation of the line passes through the given point and has the given slope.

8) $(5, 6)$; $m = -3$

Equation: $y - 6 = -3(x - 5)$

9) $(-9, 7)$; $m = -\frac{5}{6}$

Equation: $y - 7 = -\frac{5}{6}(x + 9)$

Write in **slope-intercept form** an equation of the line that passes through the given points. *(3 pts. each)*

10) $(0,-4), (4,8)$

$m = \frac{8 - -4}{4 - 0}$

$= \frac{12}{4}$

$= 3$

Equation: $y = 3x - 4$

11) $(2,1), (3, 5)$

$m = \frac{5-1}{3-2}$

$= \frac{4}{1}$

$y - 1 = 4(x - 2)$

$y - 1 = 4x - 8$

$y = 4x - 7$

Equation: $y = 4x - 7$

12) You are an avid coin collector. You start off with 20 coins. After 15 days you count and find out you have 155 coins. Write an equation that represents the number of y coins after x days.

$(0, 20)$ $(15, 155)$

$m = \frac{155 - 20}{15 - 0}$

$= \frac{135}{15}$

$= 9$

$y = 9x + 20$

pp. 261-263 #5-11, 13, 20-23

5. $y = \frac{4}{3}x + 2$

6. $y = -4x - 2$

7. $y = 3$

8. $y = 2x$

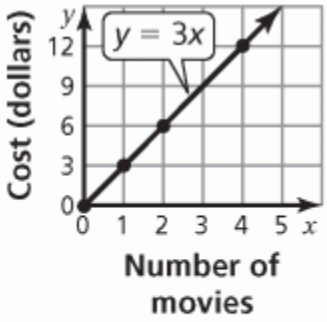
9. $y = -\frac{1}{4}x$

10. $y = \frac{2}{3}x + 5$

11. **a.** independent variable: x; dependent variable: y

b. $y = 3x$; It costs \$3 to rent one movie.

c.



d. \$9

13. **a.** $y = -0.2x + 1$

b. The slope indicates that the power decreases by 20% per hour. The x-intercept indicates that the battery lasts 5 hours. The y-intercept indicates that the battery power is at 100% when you turn on the laptop.

c. 1.25 hours

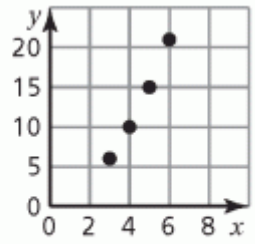
20. $b = -2.6$

21. $w = 1.5$

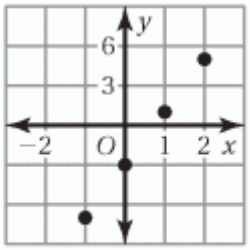
22. $y = 2\frac{7}{20}$

23. C

pp. 270-271 #5-10, 12-13, 16, 19-21

5. 

nonlinear

6. 

linear

7. linear; The graph is a line.

8. nonlinear; The graph is not a line.

9. linear; As x increases by 6, y increases by 4.

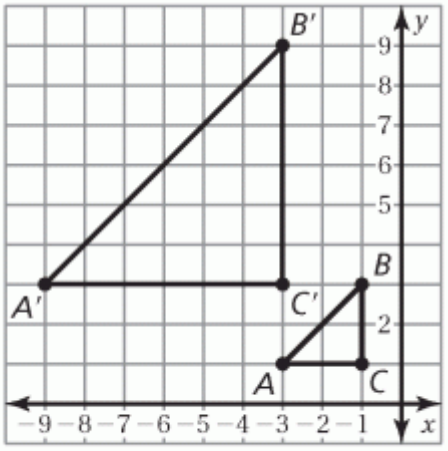
10. nonlinear; As x increases by 2, y changes by different amounts.

12. linear; You can rewrite the equation in slope-intercept form.

13. linear; You can rewrite the equation in slope-intercept form.

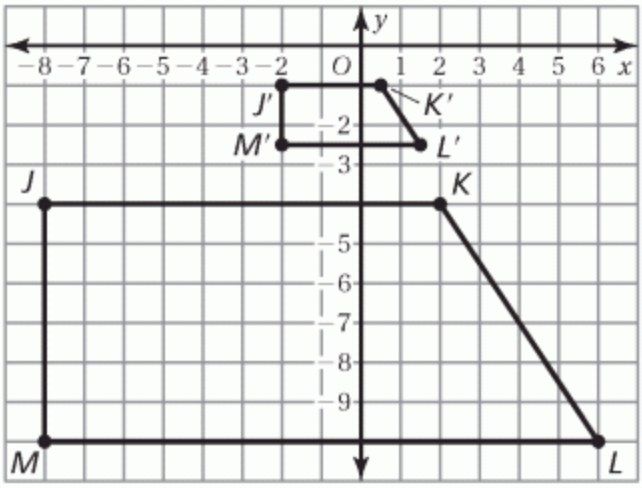
16. See *Taking Math Deeper*.

19.



enlargement

20.



reduction

21. C

pp. 276-277 #7, 11-18, 23

7. The volume of the balloon increases at a constant rate, then stays constant, then increases at a constant rate, then stays constant, and then increases at a constant rate.

11. The hair length increases at a constant rate, then decreases instantly, then increases at a constant rate, then decreases instantly, and then increases at a constant rate.

12. The loan balance remains constant, then decreases instantly, then remains constant, then decreases instantly, and then remains constant.

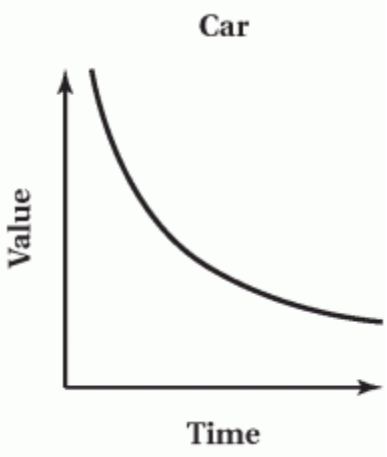
13. **a.** The usage decreases at an increasing rate.

b. The usage decreases at a decreasing rate.

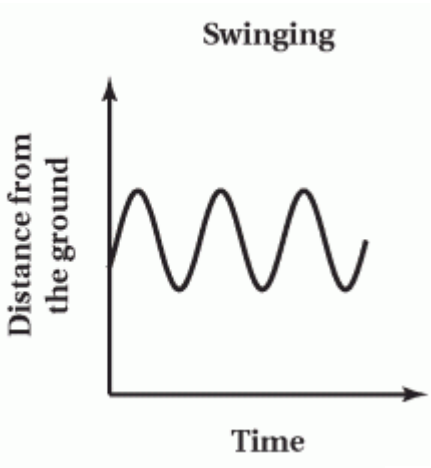
14. **a.** They both improved (increased scores) throughout the season.

b. Mark; Mike

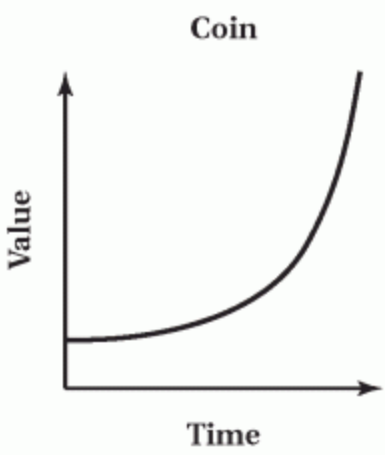
15.



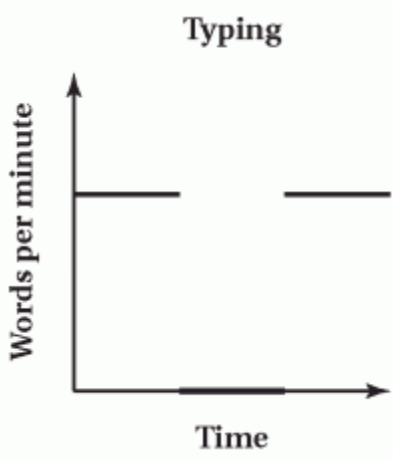
16.


Swinging
Distance from the ground
Time

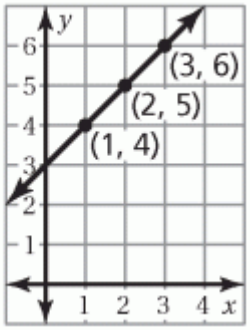
17.

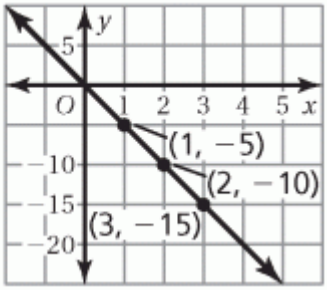

Coin
Value
Time

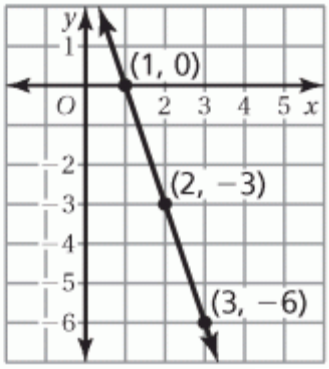
18.


Typing
Words per minute
Time

pp. 279-281 #1-15

1. no
2. yes
3. -11
4. -4
5. 7
6. 

7. 

8. 

9. $y = \frac{1}{3}x + 3$
10. $y = -7$
11. linear; As x increases by 3, y increases by 9.
12. nonlinear; As x increases by 2, y changes by different amounts.

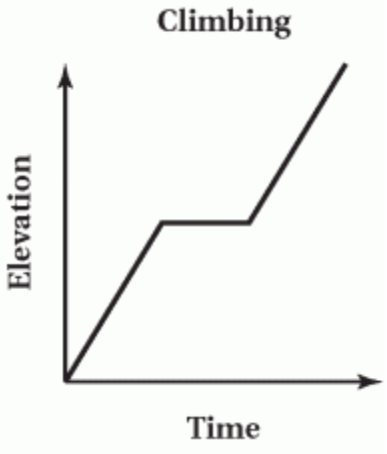
13. a. The sales of Company A increase at a constant rate, then decrease at a constant rate, then increase at a constant rate. The sales of Company B increase then decrease, then increase and decrease again. None of the rates of increase or decrease are constant.

b. Overall, the sales of Company A increased over the time period. The sales of Company B appear to be the same at the beginning and end of the time period.

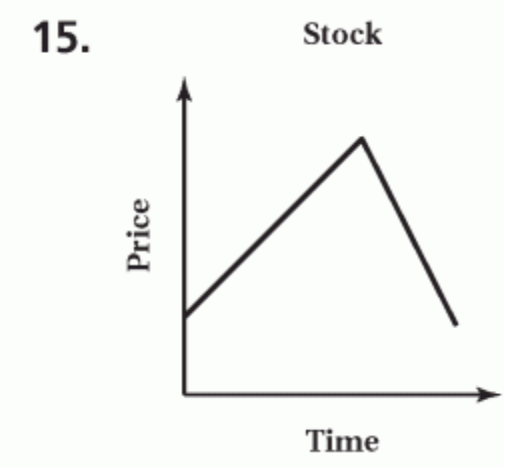
The sales of Company A increased and decreased at a constant rate over the time period. The sales of Company B did not increase or decrease at a constant rate.

Both graphs are nonlinear. The graph for Company A consists of three linear sections. The graph for Company B has no linear sections.

14.

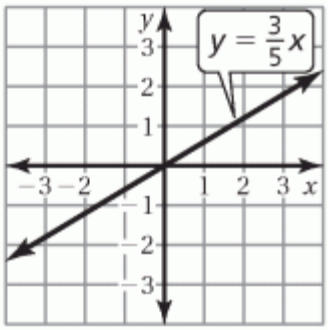


15.

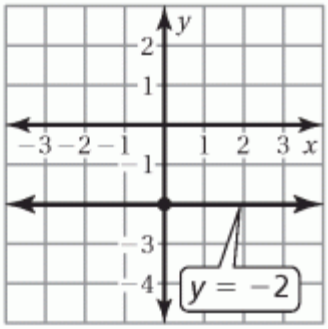


pp. 191-195 #1-27 Odd

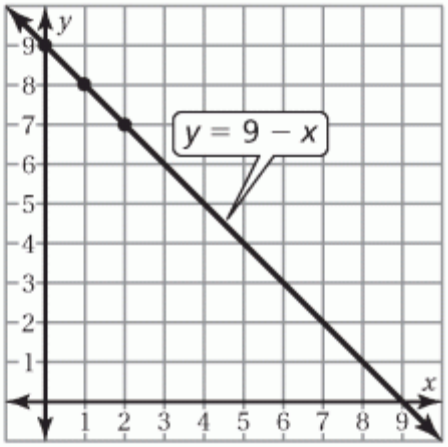
1.



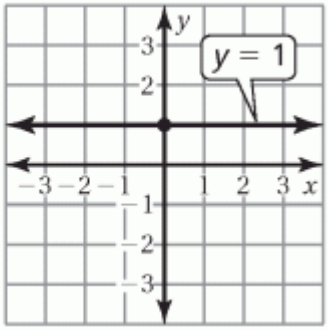
2.



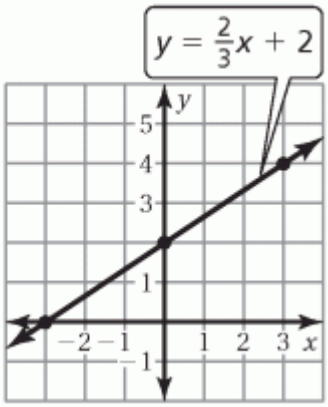
3.



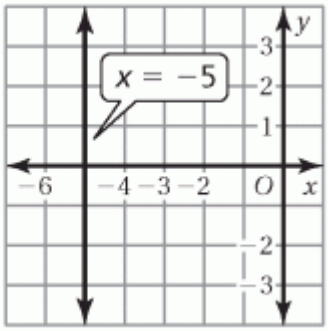
4.



5.



6.

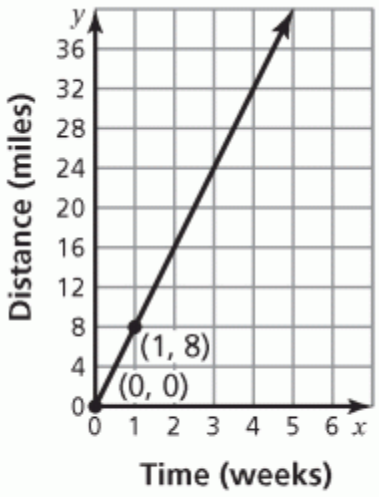


7. 1

8. $\frac{1}{2}$

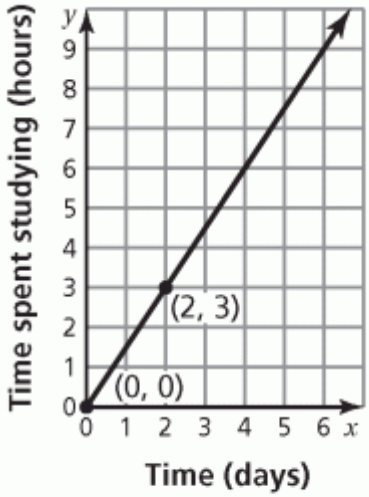
9. no; yes; The line $x = 2$ is vertical. The line $y = 4$ is horizontal. A vertical line is perpendicular to a horizontal line.

10.



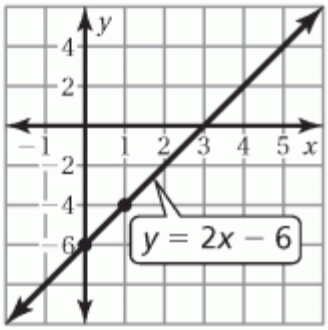
You run 8 miles per week.

11.



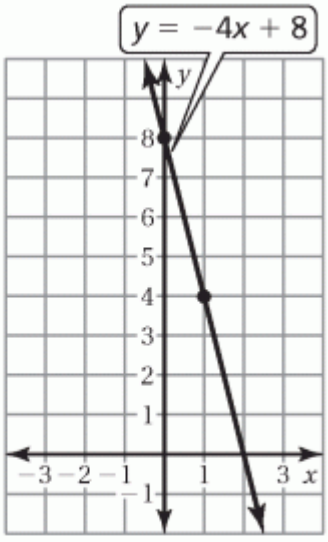
You study 1.5 hours per day.

12.



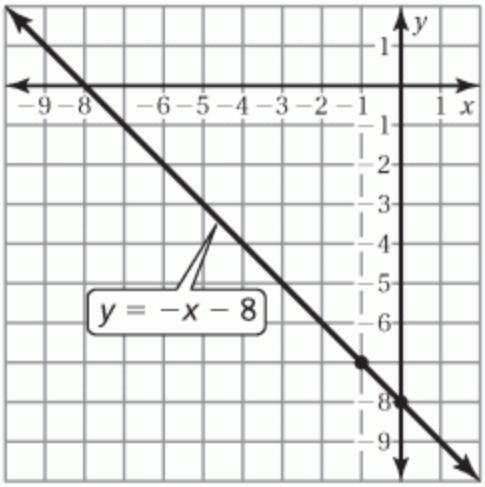
x-intercept: 3

13.



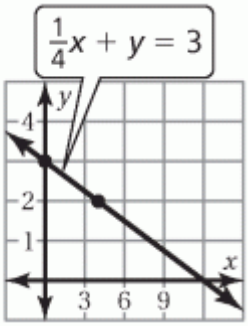
x-intercept: 2

14.

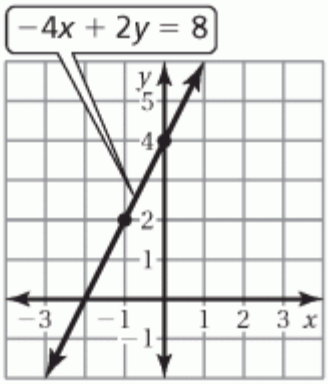


x-intercept: -8

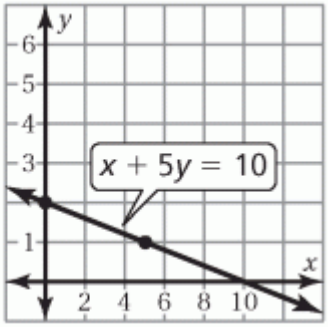
15.



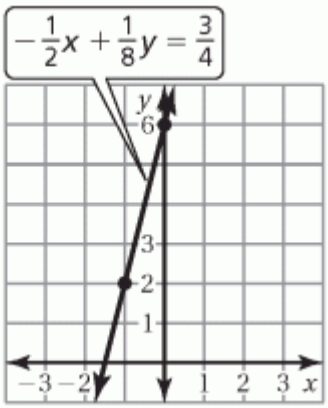
16.



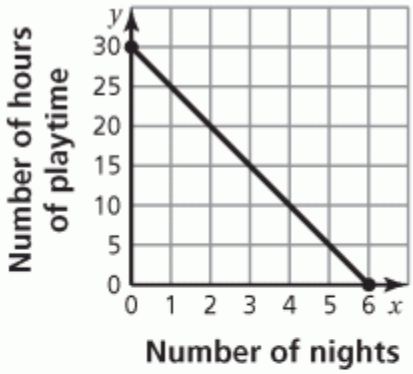
17.



18.



19.



The x-intercept shows that you can board your dog for 6 nights when there are no hours of playtime. The y-intercept shows that you can have 30 hours of playtime for your dog when you do not leave your dog at the kennel for any nights.

20. $y = x - 2$

21. $y = -\frac{1}{2}x + 4$

22. $y = -2x + 1$

23. $y = 2x - 3$

24. $y = 8$

25. $y = -5$

26. $y - 4 = 3(x - 4)$

27. $y = -\frac{1}{2}x$