

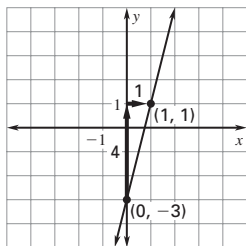
Chapter 5, continued

21. $4x - y = 3$

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

$$y = 4x - 3$$

$$m = 4, b = -3$$

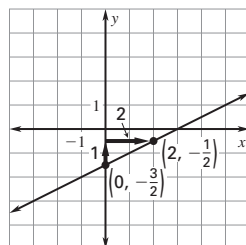


22. $3x - 6y = 9$

$$-6y = -3x + 9$$

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

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

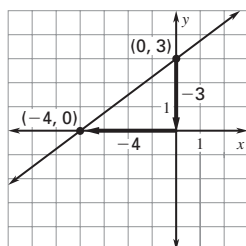


23. $-3x + 4y - 12 = 0$

$$4y = 3x + 12$$

$$y = \frac{3}{4}x + 3$$

$$m = \frac{3}{4}, b = 3$$



24. Athlete 1:

$$d = -6.4t + 60$$

$$m = -6.4, b = 60$$

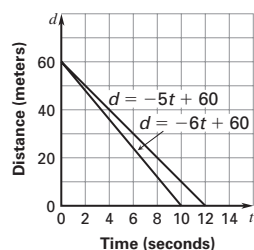
t -intercept:

$$0 = -6.4t + 60$$

$$6.4t = 60$$

$$t = 9.375$$

Athlete 1 finishes the race in 9.375 seconds.



$$12 - 9.375 = 2.625$$

The first athlete finishes the race about 2.625 seconds faster than the second athlete.

25. $x - y = 3$

$$-y = -x + 3$$

$$y = x - 3$$

No, the equation does not represent direct variation because it cannot be rewritten in the form $y = ax$.

Athlete 2:

$$d = -5t + 60$$

$$m = -5, b = 60$$

t -intercept:

$$0 = -5t + 60$$

$$5t = 60$$

$$t = 12$$

Athlete 2 finishes the race in 12 seconds.

26. $x + 2y = 0$

$$2y = -x$$

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

Yes, the equation represents direct variation because it can be rewritten in the form $y = ax$. The constant of variation is $-\frac{1}{2}$.

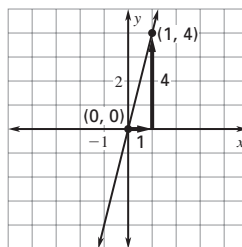
27. $8x - 2y = 0$

$$-2y = -8x$$

$$y = 4x$$

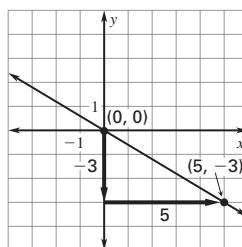
Yes, the equation represents direct variation because it can be rewritten in the form $y = ax$. The constant of variation is 4.

28. $y = 4x$



29. $-5y = 3x$

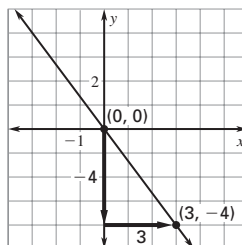
$$y = -\frac{3}{5}x$$



30. $4x + 3y = 0$

$$3y = -4x$$

$$y = -\frac{4}{3}x$$



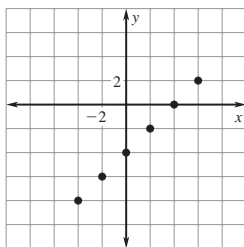
Chapter 5 Test (p. 313)

1. A relation is a *function* if for each domain element there is exactly one range element.
2. Two variables x and y show *direct variation* provided $y = ax$ and $a \neq 0$.

Chapter 5, continued

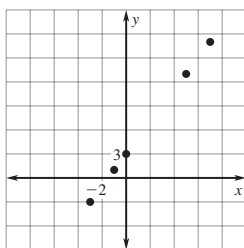
- The relation is not a function because the domain element -1 is paired with both 2 and 4 .
- The relation is a function because each domain element is paired with exactly one range element.
- $y = x - 4$

x	-4	-2	0	2	4	6
y	-8	-6	-4	-2	0	2

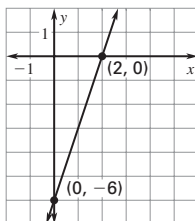


6. $y = 2x + 3$

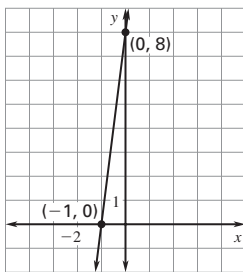
x	-3	-1	0	5	7
y	-3	1	3	13	17



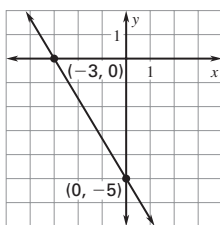
7.



8.



9.



10. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 1}{8 - 2} = \frac{3}{6} = \frac{1}{2}$

11. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 7}{0 - (-2)} = \frac{-8}{2} = -4$

12. $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{14 - 5}{3 - 3} = \frac{9}{0}$

Slope is undefined.

13. $y = -\frac{3}{2}x - 10$

$m = -\frac{3}{2}, b = -10$

14. $7x + 2y = -28$

$2y = -7x - 28$

$y = -\frac{7}{2}x - 14$

$m = -\frac{7}{2}, b = -14$

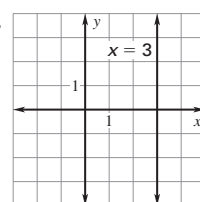
15. $3x - 8y = 48$

$-8y = -3x + 48$

$y = \frac{3}{8}x - 6$

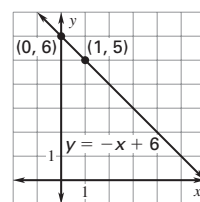
$m = \frac{3}{8}, b = -6$

16.



17. $y + x = 6$

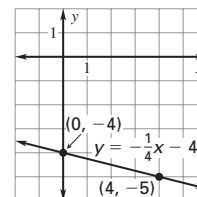
$y = -x + 6$



18. $2x + 8y = -32$

$8y = -2x - 32$

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



19. $x + 4y = 4$

$4y = -x + 4$

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

Because the equation cannot be rewritten in the form $y = ax$, it does not represent direct variation.

20. $-\frac{1}{3}x - y = 0$

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

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

Because the equation can be written in the form $y = ax$, it represents direct variation. The constant of variation is $-\frac{1}{3}$.

21. $3x - 3y = 0$

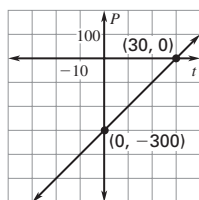
$-3y = -3x$

$y = x$

Because the equation can be written in the form $y = ax$, it represents direct variation. The constant of variation is 1.

Chapter 5, continued

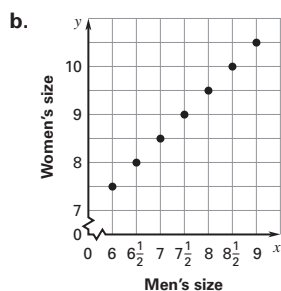
22. $P = 10t - 300$



You must work 30 hours to break even.

23. a. Notice that each women's size y is $1\frac{1}{2}$ (or $\frac{3}{2}$) more than the corresponding men's size x . So, a rule for the function is $y = x + \frac{3}{2}$.

Domain: $6, 6\frac{1}{2}, 7, 7\frac{1}{2}, 8, 8\frac{1}{2}, 9$; range: $7\frac{1}{2}, 8, 8\frac{1}{2}, 9, 9\frac{1}{2}, 10, 10\frac{1}{2}$



Multiple Choice Strategies (p. 315)

- You can eliminate choice D, $(0, 1)$, because this point is the y -intercept of the graph of $y = \frac{1}{3}x + 1$. So, it is a solution of the equation.
- You can eliminate choice D, \$10, as the cost per person because the table shows that the cost for *two* people is \$10.

Multiple Choice Practice (pp. 316–317)

1. B;
Because the graph includes the point $(-1, -2)$, -1 is in the domain of the function.

2. D;
Because the graph includes the point $(3, 4)$, the graph would no longer be a function if the point $(3, -1)$ were also included.

3. C;
The graph passes through the points $(2, -1)$ and $(0, -4)$. So, the slope is $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - (-1)}{0 - 2} = \frac{-3}{-2} = \frac{3}{2}$ and the y -intercept $b = -4$. The equation $y = \frac{3}{2}x - 4$ has the graph shown.

4. A;

x	0	1	2	3
$y = 3x + 6$	6	9	12	15

Range: 6, 9, 12, 15

5. C;

The w -intercept of the graph of the equation represents the amount of water at time $t = 0$, or the initial amount of water in the tank.

6. D;

The time spent waiting is the time from $x = 4$ minutes to the time $x = 12$ minutes, so the traveler waits 8 minutes for the shuttle bus.

7. C;

$$m = k \cdot a$$

$$6 = k \cdot 9$$

$$\frac{6}{9} = k$$

$$\frac{2}{3} = k$$

The constant of variation is $\frac{2}{3}$.

8. B;

$$\frac{21.00}{30} = \frac{31.50}{45} = \frac{42.00}{60} = 0.7$$

The cost per minute is \$.70

9. B;

Domain: $0 \leq f \leq 3$; range: $30(0) \leq C \leq 30(3)$, or $0 \leq C \leq 90$

10. A;

Notice from the table that each output y is 3 less than the corresponding input x . So, a rule for the function is $y = x - 3$.

11. D;

$$y - x = 7$$

$$y - 0 = 7$$

$$y = 7$$

The y -intercept of the graph of $y - x = 7$ is 7.

12. C;

$(-3, 0), (0, 1)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 0}{0 - (-3)} = \frac{1}{3}$$

13. A;

$$w = ar$$

$$\frac{3}{4} = a\left(\frac{1}{2}\right)$$

$$\frac{3}{2} = a$$

$$w = \frac{3}{2}r$$