13. A translation 4 units left is a horizontal translation that adds 4 to each input value.

$g(x) = f(x + 4)$

$= \frac{1}{3}(x + 4) - \frac{2}{3}$

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

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

The transformed function is $g(x) = \frac{1}{3}x + \frac{2}{3}$.

14. A translation 2 units down is a vertical translation that subtracts 2 from each output value and a horizontal shrink by a factor of $\frac{2}{3}$ multiplies each input value by $\frac{3}{2}$.

$g(x) = f\left(\frac{3}{2}x\right) - 2$

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

The transformed function is $g(x) = \frac{3}{2}x - 2$.

15. A translation 9 units down is a vertical translation that subtracts 9 from each output value and a reflection in the y-axis changes the sign of each input value.

$g(x) = f(-x) - 9$

$= -x - 9$

The transformed function is $g(x) = -x - 9$.

16. A reflection in the x-axis changes the sign of each output value, a vertical stretch by a factor of 4 multiplies each output value by 4, a translation 7 units down adds -7 to each output value, and a translation 1 unit right subtracts 1 from each input value.

$g(x) = 4(-f(x - 1)) - 7$

$= -4|x - 1| - 7$

The transformed function is $g(x) = -4|x - 1| - 7$.

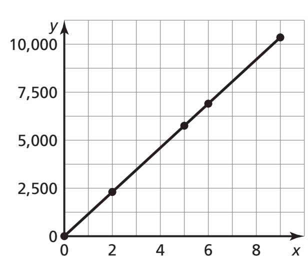
17. A translation 1 unit down is a vertical translation that subtracts 1 from each output value, a translation 2 units left is a horizontal translation that adds 2 to each input value, and a vertical shrink by a factor of $\frac{1}{2}$ multiplies each output value by $\frac{1}{2}$.

$g(x) = \frac{1}{2}[\,f(x + 2) - 1\,]$

$= \frac{1}{2}|x + 2| - \frac{1}{2}$

The transformed function is $g(x) = \frac{1}{2}|x + 2| - \frac{1}{2}$.

18.



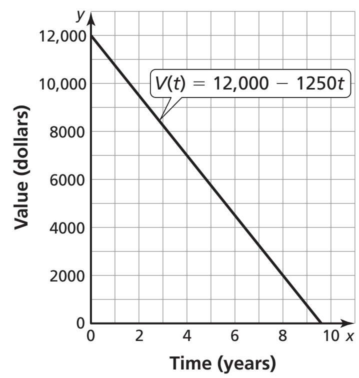
The data appear to lie on a straight line. So, a linear function can be used to model the data. The estimated mileage after 1 year is 13,800 miles.

19. Half the price relates to a vertical shrink by a factor of $\frac{1}{2}$ and the discount of \$30 relates to a vertical translation 30 units down. The function for the amount that senior citizens pay is given by $g(x) = \frac{1}{2}(20x + 80) - 30 = 10x + 10$. So, if a senior citizen camped for 3 days the cost would be $g(3) = 10(3) + 10 = \$40$.

1.3 Explorations (p. 21)

1. a. A linear function that models the value V of the copier, where t is the number of years after it was purchased, is $V(t) = -1250t + 12,000$.

b.



The depreciation is called straight line depreciation because the value decreases, or depreciates, at a constant rate.

c. The slope represents the value the copier decreases each year, which is \$1250.

2. a. The corresponding graph is B. The slope, -20, is the amount the loan is reduced per week and the y-intercept is the original amount of the loan, 200.

b. The corresponding graph is C. The slope, 2, is the amount earned per unit produced per hour and the y-intercept is the base amount earned per hour, 12.5.

c. The corresponding graph is A. The slope, 0.565, is the amount paid for each mile driven and the y-intercept is the amount paid per day for food, 30.

d. The corresponding graph is D. The slope, -100, is the value the computer decreased per year and the y-intercept is the amount paid when the computer was purchased, 750.

3. The y-intercept of a linear function represents the original or base amount, and the slope represents the change over time.

Chapter 1

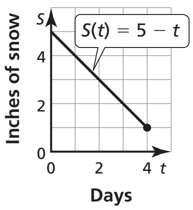
4. *Sample answer:* the amount of snow on the ground over a five-day period

a.

	A	B
1	**Day**	**Inches of snow**
2	0	5
3	1	4
4	2	3
5	3	2
6	4	1

b. A function that models the depreciation is $S(t) = 5 - t$, where t is the time (in days) and $S(t)$ is the snowfall amount (in inches).

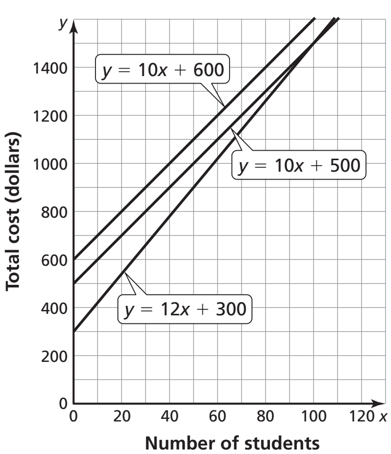
c.



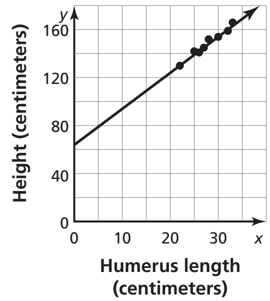
1.3 Monitoring Progress (pp. 22–25)

1. The slope of the line is $m = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{18 - 15}{0 - 10} = -\dfrac{3}{10}$ and the y-intercept is 18. So the equation of the line is $y = -\dfrac{3}{10}x + 18$. The balance decreases \$300 per payment and the initial amount is \$18,000. The amount remaining after 36 months is $y = -\dfrac{3}{10}(36) + 18 = 7.2$, or \$7200.

2. In this situation, the rental fee is \$500 and the cost for the 140 students is \$1400. An equation that models the cost for using Maple Ridge is $y = 10x + 500$, where y is the cost and x is the number of students. So, Maple Ridge will always cost less than Sunview Resort because the rental cost is less for Maple Ridge with the same cost per student. Maple Ridge will cost less if there are more than 100 students when compared to the cost of Lakeside Inn.



3. a.



The data show a linear relationship. Use the points (22, 130) and (30, 154) to write an equation of the line.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{154 - 130}{30 - 22} = \frac{24}{8} = 3$$

$$y - y_1 = m(x - x_1)$$

$$y - 130 = 3(x - 22)$$

$$y - 130 = 3x - 66$$

$$y = 3x + 64$$

So, an equation of a line is $y = 3x + 64$. Use this equation to estimate the height of the woman.

$y = 3(40) + 64 = 184$

The approximate height of a woman with a 40-centimeter humerus is 184 centimeters.

b. Using the *linear regression* feature on a graphing calculator, the line of best fit for the data is given by the equation $y = 3.05x + 63.53$. A female that has a humerus 40 centimeters long will have an approximate height of $y = 3.05(40) + 63.53 \approx 185.53$ centimeters. The result in part (a) is relatively close to the height given by the linear regression line.

1.3 Exercises (pp. 26–28)

Vocabulary and Core Concept Check

1. The linear equation $y = \frac{1}{2}x + 3$ is written in slope-intercept form.

2. When a line of best fit has a correlation coefficient of -0.98, this means that the slope is negative.

Monitoring Progress and Modeling with Mathematics

3. From the graph, the slope is $m = \frac{2}{10} = 0.2$ and the y-intercept is $b = 0$. Using slope-intercept form, an equation of the line is

$$y = mx + b$$

$$= 0.2x + 0.$$

The equation is $y = 0.2x$. The slope indicates that the tip increases \$0.20 for every dollar spent on the meal.

Chapter 1

4. From the graph, the slope is $m = \frac{-3}{90} = -\frac{1}{30}$ and the y-intercept is $b = 12$. Using slope-intercept form, an equation of the line is

$y = mx + b$

$y = -\frac{1}{30}x + 12.$

The equation is $y = -\frac{1}{30}x + 12$. The slope indicates that the amount of fuel in the gasoline tank decreases by $\frac{1}{30}$ gallon per mile driven.

5. From the graph, the slope is $m = \frac{100}{2} = 50$ and the y-intercept is $b = 100$. Using slope-intercept form, an equation of the line is

$y = mx + b$

$y = 50x + 100.$

The equation is $y = 50x + 100$. The slope indicates that the savings account balance increases by \$50 per week.

6. From the graph, the slope is $m = \frac{6}{4} = 1.5$ and the y-intercept is $b = 0$. Using slope-intercept form, an equation of the line is

$y = mx + b$

$y = 1.5x + 0.$

The equation is $y = 1.5x$. The slope indicates that the height of the tree increases by 1.5 feet per year.

7. From the graph, the slope is $m = \frac{165 - 55}{3 - 1} = \frac{110}{2} = 55$ and the y-intercept is $b = 0$. Using slope-intercept form, an equation of the line is

$y = mx + b$

$y = 55x + 0.$

The equation is $y = 55x$. The slope indicates that the typing rate is 55 words per minute.

8. From the graph, the slope is $m = \frac{300 - 180}{3 - 5} = \frac{120}{-2} = -60.$

Using slope-intercept form, an equation of the line is

$y - y_1 = m(x - x_1)$

$y - 300 = -60(x - 3)$

$y = -60x + 480.$

The equation is $y = -60x + 480$. The slope indicates that the water level in the swimming pool decreases by 60 cubic feet per hour.

9. 1. **Understand the Problem** You are given an equation that represents the total cost for an advertisement at the Greenville Journal and a table of values showing total costs for advertisements at the Daily Times. You need to compare costs.
2. **Make a Plan** Write an equation that models the total cost of advertisements at the Daily Times. Then compare the slopes to determine which newspaper charges less per line. Finally, equate the cost expressions and solve to determine the number of lines for which the total costs are equal.
3. **Solve the Problem** The slope is $m = \frac{30 - 27}{5 - 4} = 3.$

Using point-slope form, the equation to represent the total cost for advertisements at Daily Times is

$y - y_1 = m(x - x_1)$

$y - 27 = 3(x - 4)$

$y = 3x + 15.$

Equate the cost expressions and solve.

$2x + 20 = 3x + 15$

$5 = x$

Comparing the slopes of the equations, the Greenville Journal costs \$2 per line, which is less than the \$3 per line that the Daily Times charges. The total costs are the same if there are 5 lines in an advertisement.

10. 1. **Understand the Problem** You have to write an equation that represents the linear relationship between Fahrenheit and Celsius and calculate several temperatures.
2. **Make a Plan** Use the point-slope form to write an equation that gives degrees Fahrenheit in terms of degrees Celsius. Then, substitute the given temperature for x in the equation to calculate y. Finally, rewrite the equation by solving for x.
3. **Solve the Problem** The slope is

$m = \frac{32 - 212}{0 - 100} = \frac{-180}{-100} = \frac{9}{5}$. Using point-slope form, the equation is

$y - y_1 = m(x - x_1)$

$y - 32 = \frac{9}{5}(x - 0)$

$y = \frac{9}{5}x + 32.$

(a) An equation that gives degrees Fahrenheit in terms of degrees Celsius is $y = \frac{9}{5}x + 32$.

(b) Substitute 22 for x.

$y = \frac{9}{5}(22) + 32$

$= 71.6$

The outside temperature is 71.6°F.

(c) Solve the equation for x.

$$y = \frac{9}{5}x + 32$$
$$y - 32 = \frac{9}{5}x$$
$$x = \frac{5}{9}(y - 32)$$

An equation that gives degrees Celsius in terms of degrees Fahrenheit is $x = \frac{5}{9}(y - 32)$.

(d) Substitute 83 for y.

$$x = \frac{5}{9}(83 - 32)$$
$$\approx 28.33$$

The temperature of the hotel pool is about 28.33°F.

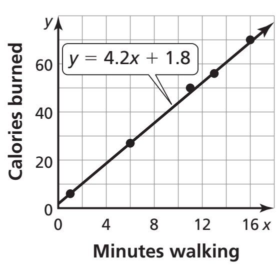
11. The slope was correctly used in the situation, however the intercept was not used correctly. In the situation the starting balance is \$100, so after 7 years the balance is \$170.

12. The slope is incorrect in the situation. The slope is 11, so the income is \$11 per hour.

13. *Sample answer:*

Step 1 Draw a scatter plot of the data. The data show a linear relationship.

Step 2 Sketch the line that most closely appears to fit the data. One possible line is shown.



Step 3 Choose two points on the line. For the line shown, you might choose (1, 6) and (6, 27).

Step 4 Write the equation of the line. First, find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{27 - 6}{6 - 1} = \frac{21}{5} = 4.2$$

Use the point-slope form to write an equation.
Use $(x_1, y_1) = (1, 6)$.

$$y - y_1 = m(x - x_1)$$
$$y - 6 = 4.2(x - 1)$$
$$y - 6 = 4.2x - 4.2$$
$$y = 4.2x + 1.8$$

Use the equation to estimate the number of calories burned.

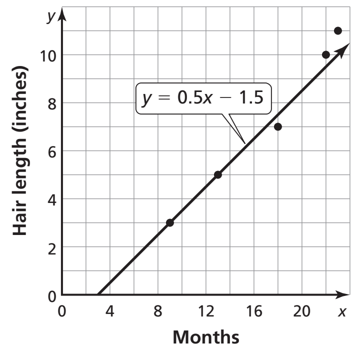
$$y = 4.2(15) + 1.8 = 64.8$$

The approximate number of calories burned when you walk for 15 minutes is 64.8 calories.

14. *Sample answer:*

Step 1 Draw a scatter plot of the data. The data show a linear relationship.

Step 2 Sketch the line that most closely appears to fit the data. One possible line is shown.



Step 3 Choose two points on the line. For the line shown, you might choose (9, 3) and (13,5).

Step 4 Write the equation of the line. First, find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 3}{13 - 9} = \frac{2}{4} = 0.5$$

Use point-slope form to write an equation.
Use $(x_1, y_1) = (9, 3)$.

$$y - y_1 = m(x - x_1)$$
$$y - 3 = 0.5(x - 9)$$
$$y - 3 = 0.5x - 4.5$$
$$y = 0.5x - 1.5$$

Use the equation to estimate the length of hair.

$$y = 0.5(15) - 1.5 = 6$$

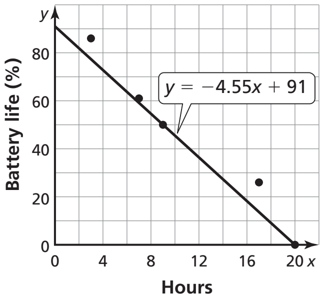
The approximate hair length after 15 months is 6 inches.

Chapter 1

15. *Sample answer:*

Step 1 Draw a scatter plot of the data. The data show a linear relationship.

Step 2 Sketch the line that most closely appears to fit the data. One possible line is shown.



Step 3 Choose two points on the line. For the line shown, you might choose (9, 50) and (20, 0).

Step 4 Write the equation of the line. First, find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 50}{20 - 9} = \frac{-50}{11} \approx -4.55$$

Use point-slope form to write an equation.
Use $(x_1, y_1) = (20, 0)$.

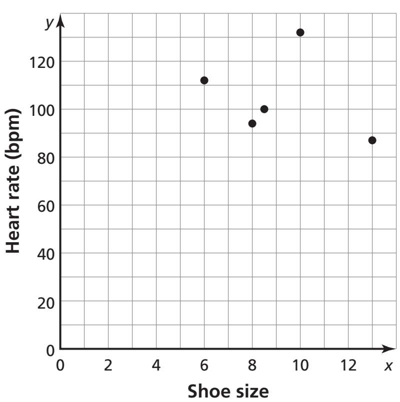
$$y - y_1 = m(x - x_1)$$
$$y - 0 = -4.55(x - 20)$$
$$y = -4.55x + 91$$

Use the equation to estimate the battery life.

$$y = -4.55(15) + 91 = 22.75$$

The approximate battery life after 15 hours is 23%.

16. Draw a scatter plot of the data. The data does not show a linear relationship.



17. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = 380.03x + 11{,}290$.

Use the equation to estimate the annual tuition cost in 2020 $(x = 15)$.

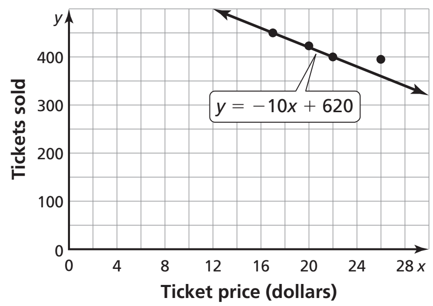
$$y = 380.03(15) + 11{,}290$$
$$= 16{,}990.45$$

The approximate average annual tuition cost in the year 2020 is \$16,990.45. The annual tuition increases by about \$380 each year and the cost of tuition in 2005 is about \$11,290.

18. *Sample answer:*

Step 1 Draw a scatter plot of the data. The data show a linear relationship.

Step 2 Sketch the limit that most closely appears to fit the data. One possible line is shown.



Step 3 Choose two points on the line. For the line shown, you might choose (17, 450) and (22, 400).

Step 4 Write the equation of the line. First, find the slope.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{400 - 450}{22 - 17} = \frac{-50}{5} = -10$$

Use point-slope form to write an equation.
Use $(x_1, y_1) = (17, 450)$.

$$y - y_1 = m(x - x_1)$$
$$y - 450 = -10(x - 17)$$
$$y - 450 = -10x + 170$$
$$y = -10x + 620$$

Use the equation to estimate the number of tickets sold.

$$y = -10(85) + 620$$
$$= -230$$

The approximate number of tickets sold when the price is \$85 is −230. This does not seem reasonable because the number of tickets sold is less than zero.

19. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = 0.42x + 1.44$.

The correlation coefficient is $r \approx 0.61$. This represents a weak positive correlation.

20. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = 0.88x + 1.69$.

The correlation coefficient is $r \approx 0.88$. This represents a strong positive correlation.

21. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = -0.45x + 4.26$.

The correlation coefficient is $r \approx -0.67$. This represents a weak negative correlation.

22. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = -1.04x + 5.68$.

The correlation coefficient is $r \approx -0.93$. This represents a strong negative correlation.

23. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = 0.61x + 0.10$.

The correlation coefficient is $r \approx 0.95$. This represents a strong positive correlation.

24. Enter the data into two lists. Use the *linear regression* feature. The line of best fit is $y = -0.48x + 4.08$.

The correlation coefficient is $r \approx -0.91$. This represents a strong negative correlation.

25. a. *Sample answer:* height and weight; temperature and ice cream sales; Correlation is positive because as the first goes up, so does the second.

b. *Sample answer:* miles driven and gas remaining; hours used and battery life remaining; Correlation is negative because as the first goes up, the second goes down.

c. *Sample answer:* age and length of hair; typing speed and shoe size; There is no relationship between the first and second.

26. a. To determine the slope of the line, use the points (0, 30) and (24, 0). So, the slope is

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 30}{24 - 0} = \frac{-30}{24} = -\frac{5}{4}.$$

The slope represents the amount the loan is reduced each month.

b. The domain of the function is $0 \le x \le 24$ and the range is $0 \le y \le 30$. The domain represents the term of the balance of the loan from start to finish and the range represents the amount left to pay on the loan.

c. The equation of the line that models the amount left to pay on the loan is $y = -\frac{5}{4}x + 30$. The amount left to pay after 12 months is $y = -\frac{5}{4}(12) + 30 = 15$, or \$1500.

27. Your friend is incorrect. Because $r = 0.3$ is closer to 0 than 1, the line of best fit will not make good predictions.

28. Consider the possible locations of the three points. (1) A and B are two different points on the line and C also lies on the line. (2) A and B are two different points of the line and C does not lie on the line.

Sample answer: Let A be (0, 4) and B be (4, 0). Then a point that is the same distance to A and to B is the midpoint of the line segment between A and B, which is

$$\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right) = \left(\frac{0 + 4}{2}, \frac{4 + 0}{2}\right) = (2, 2).$$

So, C is (2, 2).

Because points A, B, and C all lie on the same line, the equation of the line through A and C and the equation of the line through B and C are both $y = -x + 4$.

Next, let C be a point that is not on the line $y = -x + 4$. The origin is 4 units from A and 4 units from B. So, let C be (0, 0). The equation of the line through A and C is $x = 0$. The equation of the line through B and C is $y = 0$.

29. As x increases, y increases, so z decreases. Therefore, the correlation between x and z is negative.

30. The equation is D. The equation of a line that is perpendicular to the graph of $y = -4x + 1$ and passes through $(8, -5)$ has a slope of $m = \frac{1}{4}$. So, the equation is given by

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - (-5) &= \tfrac{1}{4}(x - 8) \\ y + 5 &= \tfrac{1}{4}x - 2 \\ y &= \tfrac{1}{4}x - 7. \end{aligned}$$

31. The path that will give the shortest distance to the river is given by the line that is perpendicular to the graph of $y = 3x + 2$ and that passes through the point (2, 1). The slope of a perpendicular line to $y = 3x + 2$ is $m = -\frac{1}{3}$. So, the equation of the line perpendicular to the graph of $y = 3x + 2$ and passing through the point (2, 1) is given by

$$y - y_1 = m(x - x_1)$$
$$y - 1 = -\tfrac{1}{3}(x - 2)$$
$$y - 1 = -\tfrac{1}{3}x + \tfrac{2}{3}$$
$$y = -\tfrac{1}{3}x + \tfrac{5}{3}.$$

The point where the two lines intersect has an x-value given by

$$3x + 2 = -\tfrac{1}{3}x + \tfrac{5}{3}$$
$$9x + 6 = -x + 5$$
$$10x + 6 = 5$$
$$10x = -1$$
$$x = -\tfrac{1}{10}.$$

So, the y-value of the intersection is $y = 3\left(-\frac{1}{10}\right) + 2 = \frac{17}{10}$. Thus, the closest point on the line $y = 3x + 2$ to the point (2, 1) is the point $\left(-\frac{1}{10}, \frac{17}{10}\right)$. Use the Distance Formula to find the shortest distance to the river.

$$d = \sqrt{\left[2 - \left(-\frac{1}{10}\right)\right]^2 + \left[1 - \frac{17}{10}\right]^2} = \frac{7}{\sqrt{10}} \approx 2.2$$

So, you must travel about 2.2 miles.

32. a. A positive correlation does make sense because the number of computers per capita and the average life expectancy have both increased over time, which would relate to a positive slope.

b. It is not reasonable to conclude that giving residents of a country computers will lengthen their lives. There is a correlation, but there is not a causation between the two quantities.

Maintaining Mathematical Proficiency

33. Solve the system using elimination.

$$\begin{cases} 3x + y = 7 & \text{Equation 1} \\ -2x - y = 9 & \text{Equation 2} \end{cases}$$

There is no need to change coefficients because the variable y differs only in sign.

$$3x + y = 7$$
$$-2x - y = 9$$
$$x = 16$$

So, $x = 16$. Now, back-substitute $x = 16$ into one of the original equations of the system that contains the variable x. By back-substituting $x = 16$ into Equation 1, you can solve for y.

$$3x + y = 7$$
$$3(16) + y = 7$$
$$48 + y = 7$$
$$y = -41$$

So, the solution is $x = 16$ and $y = -41$.

34. Solve the system using elimination.

$$\begin{cases} 4x + 3y = 2 & \text{Equation 1} \\ 2x - 3y = 1 & \text{Equation 2} \end{cases}$$

There is no need to change coefficients because the variable y differs only in sign.

$$4x + 3y = 2$$
$$2x - 3y = 1$$
$$6x = 3$$

Solving the equation $6x = 3$ produces $x = \frac{1}{2}$. Now back-substitute $x = \frac{1}{2}$ into one of the original equations of the system that contains the variable y. By back-substituting $x = \frac{1}{2}$ into Equation 1, you can solve for y.

$$4x + 3y = 2$$
$$4\left(\tfrac{1}{2}\right) + 3y = 2$$
$$2 + 3y = 2$$
$$3y = 0$$
$$y = 0$$

So, the solution is $x = \frac{1}{2}$ and $y = 0$.

35. Solve the system using substitution.

$$\begin{cases} 2x + 2y = 3 & \text{Equation 1} \\ x = 4y - 1 & \text{Equation 2} \end{cases}$$

Substitute $4y - 1$ from Equation 2 for x into Equation 1 and solve the resulting single-variable equation for y.

$$2x + 2y = 3$$
$$2(4y - 1) + 2y = 3$$
$$8y - 2 + 2y = 3$$
$$10y - 2 = 3$$
$$10y = 5$$
$$y = \tfrac{1}{2}$$

Finally, you can solve for x by back-substituting $y = \frac{1}{2}$ into the equation $x = 4y - 1$.

$$x = 4y - 1$$
$$x = 4\left(\tfrac{1}{2}\right) - 1$$
$$x = 2 - 1$$
$$x = 1$$

So, the solution is $x = 1$ and $y = \frac{1}{2}$.

36. Solve the system using substitution.

$$\begin{cases} y = 1 + x & \text{Equation1} \\ 2x + y = -2 & \text{Equation 2} \end{cases}$$

Substitute $1 + x$ from Equation 1 for y into Equation 2 and solve the resulting single-variable equation for x.

$$2x + y = -2$$
$$2x + (1 + x) = -2$$
$$3x + 1 = -2$$
$$3x = -3$$
$$x = -1$$

Finally, you can solve for y by back-substituting $x = -1$ into the equation $y = 1 + x$.

$$y = 1 + x$$
$$y = 1 + (-1)$$
$$y = 0$$

So, the solution is $x = -1$ and $y = 0$.

37. Solve the system using elimination.

$$\begin{cases} \tfrac{1}{2}x + 4y = 4 & \text{Equation 1} \\ 2x - y = 1 & \text{Equation 2} \end{cases}$$

You can obtain coefficients of x that differ only in sign by multiplying Equation 2 by 4.

$$\tfrac{1}{2}x + 4y = 4 \rightarrow \tfrac{1}{2}x + 4y = 4$$
$$2x - y = 1 \rightarrow 8x - 4y = 4$$
$$\tfrac{17}{2}x = 8$$

Solving the equation $\frac{17}{2}x = 8$ produces $x = \frac{16}{17}$. Now, back-substitute $x = \frac{16}{17}$ into one of the original or revised equations of the system that contains the variable x. By back-substituting $x = \frac{16}{17}$ into Equation 2, you can solve for y.

$$2\left(\tfrac{16}{17}\right) - y = 1$$
$$\tfrac{32}{17} - y = 1$$
$$-y = -\tfrac{15}{17}$$
$$y = \tfrac{15}{17}$$

So, the solution is $x = \frac{16}{17}$ and $y = \frac{15}{17}$.

38. Solve the system using substitution.

$$\begin{cases} y = x - 4 & \text{Equation 1} \\ 4x + y = 26 & \text{Equation 2} \end{cases}$$

Substitute $x - 4$ from Equation 1 for y into Equation 2 and solve the resulting single-variable equation for x.

$$4x + y = 26$$
$$4x + (x - 4) = 26$$
$$5x - 4 = 26$$
$$5x = 30$$
$$x = 6$$

Finally, you can solve for y by back-substituting $x = 6$ into the equation $y = x - 4$.

$$y = x - 4$$
$$y = 6 - 4$$
$$y = 2$$

So, the solution is $x = 6$ and $y = 2$.

1.4 Explorations (p. 29)

1. a. The system matches graph B; The two equations have the same slope but different y-intercepts, so their graphs are parallel lines. The system is inconsistent.

b. The system matches graph C; The two equations have different slopes and different y-intercepts, so there is a point that they will intersect. The system is consistent.

c. The system matches graph A; The two equations have the same slope and same y-intercept, so they will produce the same graph. The system is consistent.