Algebra Summer Workbook
Instructions

1) You can choose to do either **odds or evens**.

2) Check your answers online. Answers are on the West Middle School website.

3) Write on the workbook page itself and/or attach any scratch paper or spiral you use to do the work.

4) You may use a calculator on problem solving questions, but practice your computation skills by hand, meaning no calculator.

5) Bring the finished book with you to school on the Monday or Tuesday when you come back the first week. Please give the book and all of your work to your math teacher.

6) We offer help with this workbook on the following days, places, and times:

   Tuesdays at Mir Park at 11:00 (Picnic tables)
   Wednesdays at West at 11:00 (Commons)
   Thursdays at Infinity Park at 11:00 (Picnic tables)
Check whether the given number is a solution of the equation.

1. $7 - 2x = 15; -4$
2. $4(x - 3) = -24; -3$
3. $5x - 8x + 7 = 22; -5$
4. $\frac{x}{8} + 6 = -12; -48$
5. $\frac{3}{5}x - 9 = -3; -20$
6. $\frac{1}{2}(4x - 8) = 8; -2$

Solve the equation.

7. $3x + 5 = 32$
8. $5x - 14 = 21$
9. $\frac{x}{2} - 3 = -4$
10. $\frac{x}{-3} + 14 = 8$
11. $\frac{3}{4}x - \frac{3}{4} = 0$
12. $\frac{2x}{3} + 9 = -7$
13. $2x - 3x = 11$
14. $-4x + 9x = -30$
15. $6 = 7x + x$
16. $4x + 3x - 9 = 5$
17. $11x - 3x = 12 - 20$
18. $-2(x - 4) = 2$
19. $\frac{3}{4}(x + 2) = -1$
20. $4 = \frac{2}{3}x + 9 - \frac{1}{3}x$
21. $10 = -\frac{2}{3}(4x + 5)$
22. $-8 = \frac{1}{3}x + x$
23. $5x + 4 - 8x = 13$
24. $3x + 2(x + 5) = 15$
25. $4x - (2x + 3) = 7$
26. $x - (3x - 9) = -5$
27. $13x - 4(2x - 5) = 15$

In Exercises 28–30, write and solve an equation to answer the question.

28. **Piano Keyboard**  The keyboard of a piano has seven full octaves plus two extra white keys and one extra black key. There are 36 black keys on a piano. How many black keys are there in one octave?

29. **Band Fundraiser**  Your school band needs to buy new percussion equipment. The equipment will cost $2450. You have collected $812 in previous fundraisers. If you sell sandwiches at $3.50 each, how many sandwiches will you need to sell to raise the remaining funds?

   $\text{Cost per sandwich} \times \text{Number of sandwiches sold} + \text{Money already raised} = \text{Cost of equipment}$

30. **Wrapping a Package**  It takes 64 inches of ribbon to make a bow and wrap the ribbon around a box. The bow takes 30 inches of ribbon. The width of the box is 12 inches. What is the height of the box?
Solve for the indicated variable.

1. Simple Interest
   Solve for r: \( I = Prt \)

2. Area of a Kite
   Solve for \( d_2: \ A = \frac{1}{2}d_1d_2 \)

3. Area of a Trapezoid
   Solve for \( h: \ A = \frac{1}{2}h(b_1 + b_2) \)

4. Temperature
   Solve for \( C: \ F = \frac{5}{9}C + 32 \)

5. Surface Area of a Regular Pyramid
   Solve for \( l: \ S = B + \frac{1}{2}Pl \)

6. Surface Area of a Right Cylinder
   Solve for \( h: \ S = 2\pi r^2 + 2\pi rh \)

Rewrite the equation so that \( y \) is a function of \( x \). 

7. \( y + 9x = 4 \)
8. \( 5y - 2x = 15 \)
9. \( -2y + 10x = 8 \)
10. \( -4y - 8 = 12x \)
11. \( -4x = 2y - 16 \)
12. \( 7 - y = 3.5x \)
13. \( 2 - \frac{y}{6} = 8x \)
14. \( \frac{1}{2}y - 7 = -3x \)
15. \( 3y - 6 = 9 - 2x \)
16. \( -2x + 5y - 6 = -11 \)
17. \( 4x - 8x + 4 = 2y - 5 \)
18. \( \frac{1}{2}(y + 5) + 6x = 4x \)
19. \( 3x + 3y = 14 - 4x \)
20. \( 4x + 2(y - 3) = 10 \)
21. \( 6x - 3(y - 1) = 4x + 8 \)

Rewrite the equation so that \( x \) is a function of \( y \). Then use the result to find \( x \) when \( y = -2, -1, 0, \) and 1.

22. \( x - 2y = -3 \)
23. \( 5x - y = 10 \)
24. \( 4x - 2y = 4 \)
25. \( 5y + x = -3 + 4y \)
26. \( 3x - 2y = 4 + 7x \)
27. \( 4y - 3(x - 2) = 22 \)

Airplane Travel In Exercises 28 and 29, use the formula \( d = xt \), where \( d \) is the distance traveled at a rate of \( r \) for time \( t \).

28. Solve the equation for \( t \).

29. Determine how long (in hours and minutes) it will take an airplane to travel 2500 miles if it flies 200 miles per hour, 400 miles per hour, and 600 miles per hour.

Savings Account In Exercises 30 and 31, use the formula \( I = Prt \), where \( I \) is the simple interest on an investment of \( P \) dollars at an interest rate \( r \) for \( t \) years.

30. Solve the equation for \( P \).

31. Find the principal \( P \) invested at an interest rate 5.5% for two years that earned \$151.25 in interest.

Discounts In Exercises 32 and 33, use the relationship among the sale price \( S \), the list price \( L \), and the discount rate \( r \).

32. Solve for \( r \) in the formula \( S = L - rL \).

33. Use the new formula to find the discount rate as a decimal and as a percent.
   a. Sale price: \$51.20  b. Sale price: \$36.92
      List price: \$128  List price: \$56.80
Practice B

For use with pages 210–217

Decide which of the two points lies on the graph of the line.

1. $2x + 4y = 8$
   a. (2, 1) b. (1, 2)
2. $3x - y = 8$
   a. (2, 2) b. (3, 1)
3. $4y - 3x = -7$
   a. (3, 3) b. (-1, 1)
4. $y = 4$
   a. (4, 2) b. (2, 4)
5. $x = -3$
   a. (-3, 2) b. (3, -3)
6. $x = 0$
   a. (0, 3) b. (-1, 0)
7. $y = 4x - 2$
   a. (-1, -6) b. (0, 2)
8. $y = \frac{1}{2}x + 3$
   a. (-2, 4) b. (0, 3)
9. $y = -3(x + 1)$
   a. (-1, -6) b. (-2, 3)

Find three different ordered pairs that are solutions of the equation.

10. $y = 2x + 1$
11. $x = 5$
12. $y = -4$
13. $y = 5 - 2x$
14. $y = 3(2x + 4)$
15. $y = -\frac{1}{2}x - 4$

Rewrite the equation in function form.

16. $-2x + y = 6$
17. $x + 4y = -2$
18. $-x + y = 7$
19. $-5x + 2y = -4$
20. $3x - 5y = 1$
21. $-2x - 4y = 0$

Use a table of values to graph the equation.

22. $y = 2x + 1$
23. $y = 3x - 2$
24. $y = -4x + 2$
25. $y = -x - 3$
26. $y = \frac{1}{2}x + 3$
27. $y = -\frac{1}{2}x + 1$
28. $y = 2$
29. $x = -4$
30. $y = 0$
31. $y = -(2 - x)$
32. $y = -x + \frac{3}{2}$
33. $y = -\frac{3}{4}x + \frac{1}{2}$

Summer Income  Use the following information.

You earn $15 an hour mowing lawns and $10 an hour washing windows.
You want to make $400 in one week. An algebraic model for your earnings
is $15x + 10y = 400$, where $x$ is the number of hours mowing lawns and
$y$ is the number of hours washing windows.

34. Solve the equation for $y$. 35. Sketch a graph of the equation.

36. If you spent 14 hours mowing lawns one week, how many hours did you
   have to wash windows to earn $400?  

Distance  Use the following information.

You are 455 miles from home and you are driving toward home at a constant
rate of 65 miles per hour. The distance $d$ (in miles) away from home after $t$
hours is given by $d = 455 - 65t$.

37. Sketch the graph of the equation from $t = 0$ to $t = 7$.

38. How far from home are you after 3 hours?
Find the \( x \)-intercept of the graph of the equation.

1. \( x + 2y = 5 \)

2. \( 3x - y = 6 \)

3. \( 5x + 5y = -30 \)

4. \( 6x - 12y = 36 \)

5. \( 1.5x - 3y = -6 \)

6. \( 0.8x + 3y = 2.4 \)

7. \( y = -3x - 7 \)

8. \( y = \frac{1}{2}x + 8 \)

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

10. \( -3x + 2y = 18 \)

11. \( 4x + 2y = -16 \)

12. \( 5x - 1.2y = 3.6 \)

Sketch the line that has the given intercepts.

13. \( x \)-intercept: 3

14. \( x \)-intercept: 4

15. \( x \)-intercept: -2

\( y \)-intercept: 2

\( y \)-intercept: -1

\( y \)-intercept: 5

16. \( x \)-intercept: -6

17. \( x \)-intercept: \( \frac{1}{2} \)

18. \( x \)-intercept: 10

\( y \)-intercept: -5

\( y \)-intercept: -4

\( y \)-intercept: -6.5

Find the \( x \)-intercept and the \( y \)-intercept of the line. Graph the equation. Label the points where the line crosses the axes.

19. \( y = x + 6 \)

20. \( y = x - 9 \)

21. \( y = 1 - x \)

22. \( y = -2 - x \)

23. \( y = \frac{1}{2}x - 4 \)

24. \( y = -0.5x + 5 \)

25. \( -2x - 4y = 20 \)

26. \( -4x + 8y = -16 \)

27. \( 0.3x - 1.3y = 3.9 \)

**Ticket Sales** Use the following information.

You sold tickets to the school play. Advanced tickets were $4. Tickets bought at the door were $5.50. Total ticket sales were $440. Let \( x \) represent the number of advanced tickets sold and \( y \) represent the number of tickets sold at the door.

28. Write an equation to represent the number of tickets sold.

29. Graph the equation from Exercise 28.

30. What are three possible numbers of advanced tickets sold and tickets sold at the door?

**Stacking Crates** Use the following information.

As a part of a summer job, you stack crates. The crates have the same length and width, but have heights of 1 or 2 feet. Using a fork lift, you can stack the crates 8 feet high.

31. Make a graph showing the possible number of each type of crate in one stack.

32. If you stacked 3 of the 2-foot crates, how many of the 1-foot crates were in the stack?
Plot the points and draw a line through them. Without calculating, state whether the slope of the line is positive, negative, zero, or undefined.

1. (1, 5), (4, 3)  
2. (−5, 2), (−5, 4)  
3. (3, 3), (7, 6)
4. (2, 4), (−3, 4)  
5. (2, −4), (−3, 2)  
6. (−6, 1), (0, 3)

Find the slope of the line passing through the given points.

7. (0, 4), (1, 10)  
8. (3, 2), (2, 3)  
9. (5, 2), (3, 8)
10. (4, 6), (−2, 6)  
11. (2, 0), (1, 5)  
12. (3, −9), (3, 8)
13. (2, 9), (−6, −7)  
14. (−1, 4), (3, −2)  
15. (7, 2), (−8, −3)
16. (4, −2), (−8, −2)  
17. (−9, 0), (−9, 7)  
18. (−5, −4), (−3, −9)

Find the value of \( y \) so that the line passing through the two points has the given slope.

19. (2, \( y \)), (3, 3), \( m = 2 \)  
20. (4, \( y \)), (6, 3), \( m = −2 \)  
21. (−3, 5), (0, \( y \)), \( m = 3 \)
22. (3, 5), (1, \( y \)), \( m = \frac{3}{2} \)  
23. (−6, \( y \)), (0, 2), \( m = −\frac{1}{3} \)  
24. (5, −1), (−2, \( y \)), \( m = 1 \)

In Exercises 25 and 26, find the rate of change between the two points. Give the units of measure for the rate.

25. (2, 20) and (4, 42); \( x \) in seconds, \( y \) in feet  
26. (1, 14) and (3, 40); \( x \) in weeks, \( y \) in dollars

27. **Postage** In 1989 a postage stamp cost $0.25. In 1999 a postage stamp cost $0.33. Find the average rate of change in postage in cents per year.

28. **Calculators** In 1975 a 4-function calculator cost $125. In 1995 a 4-function calculator cost $5. Find the average rate of change in the cost of calculators in dollars per year.

**Baseball** In Exercises 29–32, use the following information.

The table shows the number of home runs in major league baseball from 1990 to 1996.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Home runs</td>
<td>3317</td>
<td>3383</td>
<td>3038</td>
<td>4030</td>
<td>3306</td>
<td>4081</td>
<td>4962</td>
</tr>
</tbody>
</table>

29. Calculate the average yearly rate of change in home runs hit from 1990 to 1992.
31. Calculate the average yearly rate of change in home runs hit from 1994 to 1996.
32. **Extension** Write a sentence comparing the results of Exercises 29–31 to the average yearly rate of change in home runs hit from 1990 to 1996.
Find the slope and $y$-intercept of the graph of the equation.

1. $y = 7x + 1$
2. $y = -3x - 4$
3. $y = -4$
4. $y - 2x = 3.2$
5. $y = \frac{x + 3}{4}$
6. $2y = 6x + 16$

Graph the equation. If necessary, write the equation in slope-intercept form first.

7. $y = x + 5$
8. $y = 2x - 4$
9. $y = 3 - 2x$
10. $y = \frac{2}{3}x$
11. $y = \frac{1}{2}x - 4$
12. $y = -x - 3$
13. $y = -\frac{3}{4}x - \frac{1}{2}$
14. $y = \frac{x + 2}{3}$
15. $5x - 10y = -20$
16. $2y = 8$
17. $x + 10y = 3 = 7$
18. $2x + 4y = 6x = 6$

Decide whether the graphs of the two equations are parallel lines.

19. $y = 2x - 1$, $y = -2x + 1$
20. $y = 6x - 7$, $y = 3 + 6x$
21. $y = \frac{1}{4}x + 5$, $y = 4x - 7$
22. $y = -\frac{1}{2}x + \frac{3}{2}$, $y = \frac{8 - x}{2}$
23. $5x + y = -4$, $y = 5x = 6$
24. $7y = 2x + 7$, $7y - 2x + 3 = 0$

**Jogging** Use the following information.
Howard decides to start jogging every day at the track. The first week he jogs 6 laps. He adds 2 laps each week for 8 weeks. Let $l$ represent the number of laps Howard runs and let $t$ represent the time in weeks since he began jogging.

25. Plot points for the number of laps Howard jogs at one week intervals. Draw a line through the points.

26. Find the slope. What does it represent?

**Telephone Calls** Use the following information.
The cost of a long-distance telephone call is $0.85 for the first minute and $0.05 for each additional minute. Let $c$ represent the total cost of a call that lasts $t$ minutes.

27. Plot points for the cost of calls in one minute intervals. Draw a line through the points.

28. Find the slope. What does it represent?

**Weight Loss** Use the following information.
The graph at the right represents the weight loss of a wrestler as he prepares for the state meet.

29. Find the slope of the line. What does it represent?

30. Find the $y$-intercept. What does it represent?
Write an equation of the line.

1. The slope is 2; the y-intercept is 3.
2. The slope is 5; the y-intercept is 0.
3. The slope is 4; the y-intercept is −3.
4. The slope is −5; the y-intercept is 1.
5. The slope is −3; the y-intercept is −2.
6. The slope is 0; the y-intercept is −5.
7. The slope is $\frac{1}{2};$ the y-intercept is −8.
8. The slope is $−\frac{1}{3};$ the y-intercept is 9.
9. The slope is $\frac{3}{2};$ the y-intercept is 3.
10. The slope is $\frac{4}{3};$ the y-intercept is −7.
11. The slope is $\frac{1}{3};$ the y-intercept is $\frac{1}{3}$.
12. The slope is $−\frac{4}{3};$ the y-intercept is $\frac{7}{8}$.

Write an equation of the line shown in the graph.

13. \[ ... \]
14. \[ ... \]
15. \[ ... \]
16. \[ ... \]
17. \[ ... \]
18. \[ ... \]

19. **Mammals' Hearts** In mammals, the weight of the heart is approximately 0.005 of the total body weight. Write a linear model that gives the heart weight in terms of the total body weight.

20. Use the equation you found in Exercise 19 to complete the table at the right.

<table>
<thead>
<tr>
<th>Total weight, x (in pounds)</th>
<th>Human</th>
<th>Cow</th>
<th>Elephant</th>
<th>Whale</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heart weight, y (in pounds)

In Exercises 21 and 22, a car rental company charges a flat fee of $29 and an additional $0.15 per mile to rent a compact car.

21. Write an equation to model the total charge, y (in dollars) in terms of x, the number of miles driven.

22. Use the equation you found in Exercise 21 to complete the table at the right.

<table>
<thead>
<tr>
<th>Miles (x)</th>
<th>25</th>
<th>50</th>
<th>100</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Write an equation of the line that passes through the point and has the given slope. Write the equation in slope-intercept form.

1. \((3, 5), m = -1\)
2. \((-2, 6), m = 4\)
3. \((7, -2), m = -3\)
4. \((2, 8), m = 0\)
5. \((-3, 0), m = 2\)
6. \((0, 0), m = -7\)
7. \((0, -2), m = -\frac{5}{3}\)
8. \((-5, -1), m = \frac{3}{4}\)
9. \((3, -2), m = -\frac{5}{7}\)

Write the slope-intercept form of the equation of the line.

10.

11.

12.

13.

14.

15.

Write an equation of the line that is parallel to the given line and passes through the given point.

16. \(y = 5x + 2, (3, 2)\)

17. \(y = -2x - 1, (2, 6)\)

18. \(y = \frac{3}{5}x + 5, (1, 1)\)

19. Between 1990 and 2000, the monthly rent for a one-bedroom apartment increased by $27 per year. In 1997, the rent was $375 per month. Find an equation that gives the monthly rent in dollars, \(y\), in terms of the year, \(t\). Let \(t = 0\) correspond to 1990. Determine the rent for 1999.

20. In Exercises 19 and 20, use the following information.

21. Between 1992 and 1999, you added approximately 21 stamps per year to your collection. In 1997 you had 109 stamps. Find an equation that represents the number of stamps in your collection, \(y\), in terms of the year, \(t\). Let \(t = 0\) correspond to 1992. Calculate the number of stamps in 1999.

22. In Exercises 21 and 22, use the following information.

23. You work as a dental assistant where you are given a $0.75 per hour raise each year. In year three (after two raises), you earn $9.50 per hour. Write an equation that models your hourly wage, \(w\), in terms of the number of years, \(n\), since you started as a dental assistant.

24. What was your starting hourly wage as a dental assistant?
Write an equation in slope-intercept form of the line shown in the graph.

1. \[ \text{(6, 3)} \quad \text{(4, 1)} \]

2. \[ \text{(-3, 4)} \quad \text{(-1, 2)} \]

3. \[ \text{(1, 1)} \quad \text{(-1, -7)} \]

4. \[ \text{(-3, 3)} \quad \text{(3, 1)} \]

5. \[ \text{(-1, -3)} \quad \text{(1, 1)} \]

6. \[ \text{(-2, 6)} \quad \text{(2, 0)} \]

Write an equation in slope-intercept form of the line that passes through the points.

7. \((0, 8), (-1, 3)\)

8. \((-7, 9), (-5, -3)\)

9. \((3, 2), (7, 5)\)

10. \((4, 2), (3, 5)\)

11. \((-5, -6), (2, 8)\)

12. \((-5, 6), (-6, 1)\)

13. \((\frac{1}{2}, -1), (3, \frac{3}{2})\)

14. \((6.22, -3.75), (-1.78, 0.25)\)

15. \((\frac{1}{3}, \frac{3}{4}), (\frac{1}{3}, -\frac{5}{4})\)

Give the slope of a line perpendicular to the given line.

16. \(y = 3x + 5\)

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

18. \(y = -2x + 6\)

Geometry Connection In Exercises 19–21, use the graph.

19. Find the perpendicular sides of trapezoid WXYZ. How do you know mathematically that these two sides are perpendicular?

20. Write equations of the lines passing through the perpendicular sides.

21. Write equations of the lines passing through the two parallel sides. How do you know mathematically that these two sides are parallel?

22. Driving You drove to your cousin’s house, which is 460 miles away. After two hours, you had gone 100 miles. After 8 hours, you reached your destination. Write an equation that gives the number of miles you had driven, \(y\), in terms of the number of hours you had driven, \(t\).
**Practice B**
For use with pages 292-298

**Draw a scatter plot of data that have the given correlation.**
1. Positive
2. Negative
3. None

Copy the graph and draw a best-fitting line for the scatter plot. Write an equation of your line.

- **4.**
- **5.**
- **6.**

**Draw a scatter plot of the data. Draw a best-fitting line and write an equation of the line.**

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>1.6</td>
<td>-3.6</td>
</tr>
<tr>
<td>2.4</td>
<td>-2.7</td>
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<td>3.1</td>
<td>-1.8</td>
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<td>3.9</td>
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<tr>
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<table>
<thead>
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<td>1.9</td>
<td>7.0</td>
</tr>
<tr>
<td>2.4</td>
<td>7.6</td>
</tr>
<tr>
<td>2.8</td>
<td>8.6</td>
</tr>
<tr>
<td>3.5</td>
<td>10.1</td>
</tr>
</tbody>
</table>

**Weight Loss** In Exercises 11 and 12, use the following information.

The graph below shows the weight loss per week of a dieter. In the graph, *y* represents the person’s weight in pounds and *x* represents the weeks of the diet.

11. Find an equation of the line that you think best fits this data. Then use the equation to find the dieter’s approximate weight after 10 weeks.

![Graph showing weight loss over time]

12. Do you think this graph could continue in this pattern for a year? Explain.

**Milk Consumption** In Exercises 13 and 14, use the following information.

The table below shows the average number of gallons of milk a family drinks per week.

13. Sketch a scatter plot for this data and find an equation, and use it to find the milk consumption in one week of a 7-member family.

<table>
<thead>
<tr>
<th>Family Size</th>
<th>Number of Gallons of Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>4</td>
<td>3.8</td>
</tr>
<tr>
<td>5</td>
<td>4.7</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

14. Do you think this table of data could continue in this pattern for many more people? Explain.
Write an equation in point-slope form of the line.

1. \((-1, -2)\), \(m = -2\)
2. \((2, 1)\), \(m = -1\)
3. \((-4, -1)\), \(m = 6\)

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

4. \((-3, 4)\), \(m = -2\)
5. \((-4, -2)\), \(m = -5\)
6. \((0, -3)\), \(m = \frac{7}{3}\)
7. \((6, -5)\), \(m = -4\)
8. \((-7, 6)\), \(m = 0\)
9. \((-3, -5)\), \(m = 6\)

Write an equation in point-slope form of the line that passes through the given points.

10. \((0, 5)\), \((1, 3)\)
11. \((2, 4)\), \((6, 2)\)
12. \((3, 0)\), \((0, -3)\)
13. \((6, -2)\), \((10, 1)\)
14. \((-2, -3)\), \((4, 1)\)
15. \((1, 3)\), \((-5, -3)\)
16. \((-5, -7)\), \((-3, -10)\)
17. \((6, 11)\), \((-1, 2)\)
18. \((-3, -8)\), \((2, 4)\)

Rewrite the equation in slope-intercept form.

19. \(y + 4 = 5(x + 2)\)
20. \(y - 3 = -2(x + 1)\)
21. \(y - 5 = 3(x - 4)\)
22. \(y + 11 = -3(x - 9)\)
23. \(y + 6 = \frac{1}{2}(x - 12)\)
24. \(y - \frac{7}{3} = 4(x + \frac{5}{3})\)

**Classified Ads** In Exercises 25 and 26, use the following information.

It costs $1.50 per day to place a one-line ad in the classifieds plus a flat service fee. One day costs $3.50 and four days costs $8.00.

25. Write a linear equation that gives the cost in dollars, \(y\), in terms of the number of days the ad appears, \(x\).
26. Find the cost of a six-day ad.

**Travel** In Exercises 27 and 28, use the following information.

You are flying from Houston to Chicago. You leave Houston at 7:30 A.M. At 8:35 A.M., you fly over Little Rock, a distance of 455 miles.

27. Write a linear equation that gives the distance in miles, \(y\), in terms of time, \(x\). Let \(x\) represent the number of minutes since 7:30 A.M.
28. Approximately what time will you arrive in Chicago if it is 950 miles from Houston?
Write the equation in standard form with integer coefficients.

1. \(2x - y - 8 = 0\)
2. \(0.3x - 0.4y = 7.5\)
3. \(y = 3x + 2\)
4. \(y = 5 - 3x\)
5. \(0.6x = 2.1y + 1.8\)
6. \(2x = 3y + 5\)
7. \(x - 4 = 0\)
8. \(3y = 12\)
9. \(2x - 9 = \frac{2}{3}y\)
10. \(\frac{1}{4}x - 2y = -3\)
11. \(y = \frac{1}{3}x + 4\)
12. \(y = \frac{3}{5}x - \frac{5}{3}\)

Write the standard form of the equation of the line that passes through the given point and has the given slope.

13. \((4, 3), m = 2\)
14. \((1, 5), m = -4\)
15. \((0, 6), m = 3\)
16. \((-2, 4), m = -6\)
17. \((6, -8), m = \frac{1}{3}\)
18. \((-2, 4), m = -\frac{1}{2}\)

Write the standard form of the equation of the line that passes through the given points.

19. \((5, 8), (3, 2)\)
20. \((-2, 5), (3, -10)\)
21. \((-7, 3), (1, 2)\)
22. \((-4, -5), (-2, 5)\)
23. \((8, 1), (4, -1)\)
24. \((-6, 6), (3, 3)\)

Write the standard form of the equation of the horizontal and vertical lines that pass through the given point.

25. \((3, -4)\)
26. \((5, 1)\)
27. \((-3, -2)\)
28. \((0, -4)\)

**Party Food** In Exercises 29–32, use the following information.

You are in charge of buying the hamburger and boned chicken for a party. You have $60 to spend. The hamburger costs $2 per pound and boned chicken is $3 per pound.

29. Write an equation that represents the different amounts of hamburger, \(x\), and chicken, \(y\), that you can buy.

30. Rewrite the equation in Exercise 29 in slope-intercept form.

31. Sketch the graph of the linear equation in Exercise 29.

32. Complete the table and label the points from the table on the graph.

<table>
<thead>
<tr>
<th>Hamburger (lb), (x)</th>
<th>0</th>
<th>6</th>
<th>12</th>
<th>18</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken (lb), (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lawn Seed** In Exercises 33–36, use the following information.

You are buying $48 worth of lawn seed that consists of two types of seed. One type is a quick-growing rye grass that costs $4 per pound, and the other type is a higher-quality seed that costs $6 per pound.

33. Write an equation that represents the different amounts of $4 seed, \(x\), and $6 seed, \(y\), that you can buy.

34. Rewrite the equation in Exercise 33 in slope-intercept form.

35. Sketch the graph of the linear equation in Exercise 33.

36. Complete the table and label the points from the table on the graph.

<table>
<thead>
<tr>
<th>$4 seed (lb), (x)</th>
<th>0</th>
<th>3</th>
<th>6</th>
<th>9</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6 seed (lb), (y)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Tell whether it is reasonable for the graph to be represented by a linear model.

1. 

2. 

3. 

4. 

5. 

6. 

**Company Profits** In Exercises 7 and 8, use the following information.

Let \( y = 4.2x + 7.1 \) represent a company's profit, in thousands of dollars, from 1985 to 1995. Let \( x \) represent the number of years since 1985.

7. Use linear interpolation to predict the profit for 1990.

8. Use linear extrapolation to predict the profit for 1998.

**Chemical Workers** In Exercises 9–12, use the table, which shows the average salary, \( S \), of chemical workers in year \( t \).

<table>
<thead>
<tr>
<th>Year (1982)</th>
<th>Salary (1000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982</td>
<td>16,731</td>
</tr>
<tr>
<td>1985</td>
<td>19,227</td>
</tr>
<tr>
<td>1987</td>
<td>21,839</td>
</tr>
<tr>
<td>1990</td>
<td>26,269</td>
</tr>
<tr>
<td>1992</td>
<td>28,836</td>
</tr>
<tr>
<td>1994</td>
<td>30,665</td>
</tr>
<tr>
<td>1995</td>
<td>31,345</td>
</tr>
<tr>
<td>1997</td>
<td>33,065</td>
</tr>
</tbody>
</table>

9. Make a scatter plot of the average salary of chemical workers in terms of the year \( t \). Let \( t \) represent the number of years since 1982.

10. Write a linear model for this data.

11. Use the linear model to estimate the average salary in 1993.

12. Use the linear model to estimate the average salary in 1999.

**Whole Milk Consumption** In Exercises 13–16, use the table, which shows the number of pounds of whole milk, \( W \), consumed per person in the United States in year \( t \).

<table>
<thead>
<tr>
<th>Year (1980)</th>
<th>Pounds of Milk (1000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>141.7</td>
</tr>
<tr>
<td>1985</td>
<td>119.7</td>
</tr>
<tr>
<td>1990</td>
<td>87.7</td>
</tr>
<tr>
<td>1992</td>
<td>81.2</td>
</tr>
<tr>
<td>1995</td>
<td>72.6</td>
</tr>
<tr>
<td>1996</td>
<td>72.1</td>
</tr>
</tbody>
</table>

13. Make a scatter plot of the pounds of whole milk consumed in terms of the year \( t \). Let \( t \) represent the number of years since 1980.

14. Write a linear model for this data.

15. Use the linear model to estimate the number of pounds of whole milk consumed in 1994.

16. Use the linear model to estimate the number of pounds of whole milk consumed in 1999.
Write an inequality that describes the graph shown.

1.  

2.  

3.  

4.  

Sketch a graph of the inequality.

5.  $x < -1$

6.  $x \geq 7$

7.  $6.5 < x$

8.  $-1.8 \leq x$

9.  $x \geq 9$

10.  $x \leq -4$

Solve the inequality and graph its solution.

11.  $x + 7 < 11$

12.  $x - 2 \leq 5$

13.  $3x > 6$

14.  $-2x \geq 8$

15.  $x - 4 < -2$

16.  $-3 > x - 7$

17.  $\frac{x}{3} \geq -2$

18.  $\frac{x}{4} < 1.5$

19.  $-8x \leq -24$

20.  $-7 < x + 2$

21.  $-6 \geq \frac{-x}{3}$

22.  $x + 3.5 > 8$

23.  $-3.2x \geq 16$

24.  $-4.2 \leq x + 1.9$

25.  $2.3 > \frac{-x}{5}$

26.  **Body Temperature**  Normal body temperature is $98.6^\circ F$. Write an inequality that describes the temperature $T$ of people with above normal temperatures. Graph the inequality.

27.  **Boiling Point**  Helium is the element that has the lowest boiling point, $-268.9^\circ C$. Write an inequality that describes the boiling point $b$ (in degrees Celsius) of any other element. Graph the inequality.

28.  **Profit**  You make a profit of $5.25 from each magazine you sell. Write an inequality to show how many magazines $m$ you need to sell to earn a minimum of $168. Graph the inequality.

29.  **Basketball**  Tom has scored 181 points so far this basketball season. He needs to score 207 points to tie the school record for most points scored in a season. Let $x$ represent the number of points Tom needs to score to tie or beat the record. Write an inequality for $x$. What is the least number of points Tom has to score? Graph the inequality.

30.  **Elevations in California**  The lowest elevation in California is 282 feet below sea level. Let $E$ represent the elevation of any location in California. Write an inequality for $E$. Graph the inequality.
Practice B
For use with pages 398–403

Decide whether the ordered pair is a solution of the system of linear equations.
1. (1, 1), (0, 3)
   \[ \begin{align*}
   2x + y &= 3 \\
   x - 2y &= -1
   \end{align*} \]
2. (2, 4), (-3, 8)
   \[ \begin{align*}
   4x + y &= -4 \\
   -x - y &= 1
   \end{align*} \]
3. (-5, -2), (4, 1)
   \[ \begin{align*}
   x - y &= 3 \\
   3x - y &= 11
   \end{align*} \]
4. (-6, -4), (-4, 0)
   \[ \begin{align*}
   x - 3y &= 6 \\
   2x - y &= -8
   \end{align*} \]
5. (-3, -4), (3, 6)
   \[ \begin{align*}
   -4x + y &= 8 \\
   5x - 3y &= -3
   \end{align*} \]
6. (3, -4), (-6, 2)
   \[ \begin{align*}
   -2x - y &= 6 \\
   3x + 4y &= -10
   \end{align*} \]

Use the graph to solve the linear system. Check your solution algebraically.
7. \[ \begin{align*}
   -x + y &= -8 \\
   x + y &= 4
   \end{align*} \]
8. \[ \begin{align*}
   3x + y &= -6 \\
   -x - 2y &= -3
   \end{align*} \]
9. \[ \begin{align*}
   4x + 2y &= -12 \\
   2x + 2y &= 8
   \end{align*} \]

Graph and check to solve the linear system.
10. \[ \begin{align*}
    x &= 6 \\
    y &= -3
    \end{align*} \]
11. \[ \begin{align*}
    y &= x - 2 \\
    y &= -x + 4
    \end{align*} \]
12. \[ \begin{align*}
    y &= 2x - 4 \\
    y &= -\frac{1}{2}x + 4
    \end{align*} \]
13. \[ \begin{align*}
    -3x + y &= 6 \\
    -x + y &= -2
    \end{align*} \]
14. \[ \begin{align*}
    x + 2y &= -6 \\
    -3x + y &= -10
    \end{align*} \]
15. \[ \begin{align*}
    y &= \frac{1}{2}x + 3 \\
    y &= x + 4
    \end{align*} \]

16. Juice You bought 12 1-gallon bottles of apple and orange juice for a school dance. The apple juice was on sale for $1.00 per gallon bottle. The orange juice was $1.75 per 1-gallon bottle. You spent $15.00. Assign labels to the verbal model below. Write an algebraic model. How many bottles of each type of juice did you buy?

   \[
   \begin{align*}
   \text{Number of bottles of apple juice} + \text{Number of bottles of orange juice} &= \text{Total number of bottles} \\
   \text{Price per apple juice bottle} \cdot \text{Number of bottles of apple juice} + \text{Price per orange juice bottle} \cdot \text{Number of bottles of orange juice} &= \text{Total price}
   \end{align*} \]

17. Baseball Outs In a game, 18 of a baseball team’s 27 outs were fly balls. Fifty percent of the outs made by infielders and 100% of the outs made by outfielders were fly balls. How many outs were made by infielders? How many outs were made by outfielders? (Hint: Write one equation for the total number of outs and another equation for the number of fly ball outs.)
**Practice B**

For use with pages 405-410

Solve for the indicated variable.

1. \(5x + y = -8; y\)
2. \(6x - y = 4; y\)
3. \(x + 3y = 7; x\)
4. \(-2x + 4y = 8; x\)
5. \(-3x - 3y = 9; y\)
6. \(-\frac{5}{2}x + 5y = -3; x\)

Tell which equation you would use to isolate a variable. Explain your reasoning.

7. \(4x - y = -6\)  
   \(2x + y = 0\)
8. \(2a + 4b = 10\)  
   \(3a - b = 1\)
9. \(-m + 5n = 16\)  
   \(-2m + 3n = 4\)

Use the substitution method to solve the linear system.

10. \(y = x + 3\)  
    \(3x - y = 5\)
11. \(4x + y = 9\)  
    \(y = -7\)
12. \(3x = 9\)  
    \(-2x + y = -8\)
13. \(x - 2y = -13\)  
    \(y = -2x - 6\)
14. \(x - y = 10\)  
    \(5x - y = -6\)
15. \(4x + y = 2\)  
    \(x - y = -17\)
16. \(-x + 3y = 4\)  
    \(x + 6y = 14\)
17. \(3x + 2y = 8\)  
    \(x + 4y = -4\)
18. \(x - 5y = -3\)  
    \(4x - 3y = 5\)
19. \(2x + 5y = 4\)  
    \(x + 5y = 7\)
20. \(\frac{1}{2}x + y = 2\)  
    \(2x + 3y = 9\)
21. \(\frac{1}{2}x + \frac{5}{6}y = 1\)  
    \(-\frac{1}{2}x - y = 1\)

22. **Mowing and Shoveling**  
Last year you mowed grass and shoveled snow for 10 households. You earned $200 per household mowing for the entire season and $180 per household shoveling for the entire season. If you earned a total of $1880 last year, how many households did you mow and shovel for? Assign labels to the verbal model below. Write and solve an algebraic model.

\[
\text{Number of households mow for} + \text{Number of households shovel for} = \text{Total number of households}
\]

\[
\text{Earnings per household mowing} \cdot \text{Number of households mow for} + \text{Earnings per household shoveling} \cdot \text{Number of households shovel for} = \text{Total earnings}
\]

23. **Dimensions of a Metal Sheet**  
A rectangular hole, 2 centimeters wide and \(x\) centimeters long is cut in a rectangular sheet of metal \(\frac{3}{2}\) centimeters wide and \(y\) centimeters long. The length of the hole is 1 centimeter less than the length of the metal sheet. After the hole is cut, the area of the remaining metal is 11 cm². Find the length of the hole and the length of the metal sheet.
Use linear combinations to solve the system of linear equations.

1. \( x + y = 11 \)  
   \( x - y = 7 \)
2. \( x - 2y = 8 \)  
   \( 3x + 3y = -15 \)
3. \( 3x + y = -8 \)  
   \( 3x + 4y = -2 \)
4. \( 2x - 4y = 14 \)  
   \( -2x + 3y = -11 \)
5. \( \frac{1}{3}x - y = -3 \)  
   \( -5x + y = 12 \)
6. \( 7.5x - 1.2y = -2.7 \)  
   \( -1.5x + 1.2y = -3.3 \)
7. \( x + 2y = -3 \)  
   \( x - 4y = 15 \)
8. \( -x - 5y = 30 \)  
   \( 2x - 7y = 25 \)
9. \( -x + 8y = 16 \)  
   \( 3x + 4y = 36 \)
10. \( 4x - 3y = -3 \)  
    \( 4x + 5y = 5 \)
11. \( 4x + 5y = -2 \)  
    \( 5x - 4y = -23 \)
12. \( 9x - 4y = -18 \)  
    \( -3x + 8y = 6 \)
13. \( 4x = -11 + y \)  
    \( y = 6x - 9 \)
14. \( x = 2y - 3 \)  
    \( 2y = 3x + 13 \)
15. \( 4y = 15 - 3x \)  
    \( 2y = 3x + 21 \)
16. \( 4x = 5y - 14 \)  
    \( 3y - 6x = -14 \)
17. \( 5x = 4y - 30 \)  
    \( 2x + 3y = -12 \)
18. \( \frac{7}{3}y = 10 + 4x \)  
    \( 5x = \frac{1}{3}y - 8 \)

**Electricians** In Exercises 19-21, use the following information.

The yellow pages identify two different local electrical businesses. Business A charges $50 for a service call, plus an additional $36 per hour for labor. Business B charges $35 for a service call, plus an additional $39 per hour for labor.

19. Let \( x \) represent the number of hours of labor and let \( y \) represent the total charge. Write a system of equations you could solve to find the length of a service call for which both businesses charge the same amount.

20. Solve the system.

21. Which company would you use? Why?

**Travel Agency** In Exercises 22 and 23, use the following information.

A travel agency offers two Boston outings. Plan A includes hotel accommodations for three nights and two pairs of baseball tickets worth $518. Plan B includes hotel accommodations for five nights and four pairs of baseball tickets worth $907.

22. Let \( x \) represent the cost of one night’s hotel accommodation and let \( y \) represent the cost of one pair of baseball tickets. Write a system of equations you could solve to find the cost of one night’s hotel accommodation and one pair of baseball tickets.

23. Solve the system.

**Highway Project** In Exercises 24 and 25, use the following information.

There are sixteen workers employed on a highway project, some at $200 per day and some at $165 per day. The daily payroll is $2745.

24. Let \( x \) represent the number of $200 per day workers and let \( y \) represent the number of $165 per day workers. Write a system of equations to find the number of workers employed at each wage.

25. Solve the system.
Choose a method to solve the linear system. Explain your choice, and then solve the system.

1. \(2x - 3y = 24\)
   \(2x + y = 8\)

2. \(x - y = 4\)
   \(x + y = 8\)

3. \(y - 3x = 7\)
   \(y + 2x = 2\)

4. \(2x + y = 5\)
   \(x - y = 1\)

5. \(3x - y = 9\)
   \(x + 2y = 10\)

6. \(x + y = 50\)
   \(3x - 2y = 0\)

Solve the linear system using the method of your choice.

7. \(6x + 9y = 3\)
   \(x + 4y = -2\)

8. \(-x = 10\)
   \(2x + 7y = 1\)

9. \(-3x + y = -4\)
   \(y = x - 6\)

10. \(4x - 6 = 2y\)
    \(-3x + 2y = -3\)

11. \(-3x + 5y = -10\)
    \(-3x + 6y = -12\)

12. \(2x + 3y = 8\)
    \(2x - 3y = 4\)

13. \(4x - 3y = -4\)
    \(-3x + 5y = -8\)

14. \(1.8x + 3y = 3\)
    \(-2x - 2.5y = -5\)

15. \(x - y = 2\)
    \(3x + y = -10\)

16. \(2x + 4y = -1\)
    \(4x - 3y = -2\)

17. \(6x - 3y = -5\)
    \(x - \frac{2}{3}y = -1\)

18. \(y = \frac{1}{2}x - 4\)
    \(x = -2 + \frac{1}{3}y\)

Cookout  In Exercises 19 and 20, use the following information.

You are buying the meat for a cookout. You need to buy 8 packages of meat.
A package of hotdogs costs $1.89 and a package of hamburgers costs $5.19.
You spend a total of $31.62.

19. Let \(x\) represent the number of packages of hotdogs bought and let \(y\) represent the number of packages of hamburgers bought. Write a system of equations you could solve to find the number of packages of each type of meat bought.

20. Solve the system.

21. Baseball Glove Sales  A sporting goods store sells right-handed and left-handed baseball gloves. In one month, 12 gloves were sold for a total revenue of $561. Right-handed gloves cost $45 and left-handed gloves cost $52. Find the number of each type of glove sold.

22. Southern Cuisine  Your family goes to a Southern-style restaurant for dinner. There are 6 people in your family. Some order the chicken dinner for $14.80 and some order the steak dinner for $17. If the total bill was $91, how many people ordered each dinner?

23. Dimensions of a Rectangle  The perimeter of the rectangle is 21 inches.
The perimeter of the inscribed triangle is 21 inches. Find the dimensions of the rectangle.
Match the graph with its linear system. Does the system have exactly one solution, no solution, or infinitely many solutions?

A. \(-2x + y = 6\)
   \(-4x + 2y = -6\)
B. \(x - 4y = 7\)
   \(5x + y = -7\)
C. \(-9x + 3y = -6\)
   \(-3x + y = -2\)
D. \(5x + 4y = 2\)
   \(-5x - 4y = -1\)
E. \(-2x + 3y = -6\)
   \(2x + 3y = 0\)
F. \(x - y = 2\)
   \(7x - 7y = 14\)

1. 
2. 
3. 
4. 
5. 
6. 

Use the substitution method or linear combinations to solve the linear system and tell how many solutions the system has.

7. \(-8x + 8y = -6\)
   \(3x - 3y = 8\)
8. \(-6x - 6y = -12\)
   \(-2x - 2y = -4\)
9. \(-4x - 2y = 2\)
   \(4x - 2y = 18\)
10. \(6x - 4y = -6\)
    \(3x + 2y = 1\)
11. \(3x - 2y = -5\)
    \(-9x + 6y = 15\)
12. \(x + 3y = -3\)
    \(
\frac{1}{3}x + y = 1
\)

Use the graphing method to solve the linear system and tell how many solutions the system has.

13. \(2x + y = 7\)
    \(4x + 2y = -10\)
14. \(-2x + 3y = 18\)
    \(-2x + 3y = -18\)
15. \(-x + 4y = -3\)
    \(3x - 12y = 3\)
16. \(6x - 5y = 3\)
    \(-2x + \frac{3}{2}y = 1\)
17. \(x - 7y = 10\)
    \(-6x + 4y = -22\)
18. \(\frac{1}{2}x + y = -2\)
    \(\frac{1}{3}x + 3y = 6\)

19. **Revenue and Cost** The matrix gives the revenue and cost of running a business from 1997 to 2000. Construct two scatter plots, one for revenue and one for cost. Then find the line that best fits each scatter plot.

20. **Profit** Profit can be defined as revenue minus cost. What does the graph from Exercise 19 tell you about the business’ profit from 1997 to 2000?
Lesson 3.3

Practice B
1. yes  2. yes  3. yes  4. no  5. no  6. no
7. 9  8. 7  9. -2  10. 18  11. 1  12. -24
13. -11  14. -6  15. \(\frac{4}{3}\)  16. 2  17. -1
18. 3  19. -\(\frac{10}{3}\)  20. -15  21. -5  22. -6
23. -3  24. 1  25. 5  26. 7  27. -1
28. 7x + 1 = 36; 5 black keys
29. 3.5x + 812 = 2450; 468 sandwiches
30. 2x + 24 + 30 = 64; 5 in.

Lesson 3.7

Practice B
1. \(t = \frac{1}{Pr}\)  2. \(d_2 = \frac{2A}{d_1}\)  3. \(b_1 = \frac{2A - b_2h}{h}\)
4. \(C = \frac{5}{9}(F - 32)\)  5. \(l = \frac{2(S - B)}{P}\)
6. \(h = \frac{S - 2\pi r^2}{2\pi r}\)  7. \(y = -9x + 4\)
8. \(y = \frac{2}{3}x + 3\)  9. \(y = 5x - 4\)
10. \(y = -3x - 2\)  11. \(y = -2x + 8\)
12. \(y = -3.5x + 7\)  13. \(y = -48x + 12\)
14. \(y = -6x + 14\)  15. \(y = -\frac{5}{2}x + 5\)
16. \(y = \frac{2}{3}x - 1\)  17. \(y = -2x + \frac{5}{3}\)
18. \(y = -4x - 5\)  19. \(y = \frac{14 - 7x}{3}\)
20. \(y = -2x + 8\)  21. \(y = \frac{-2x + 5}{-3}\) or
\(y = \frac{2}{3}x - \frac{5}{3}\)  22. \(x = 2y - 3; -7; -5; -3; -1\)

23. \(x = \frac{1}{3}y + 2; \frac{2}{3}; \frac{3}{2}; \frac{4}{3}\)
24. \(x = \frac{1}{2}y + 1; 0; \frac{1}{2}; 1; \frac{3}{2}\)
25. \(x = -3 - y; -1; -2; -3; -4\)
26. \(x = -\frac{1}{2}y - 1; 0; -\frac{1}{2}; -1; -\frac{3}{2}\)
27. \(x = \frac{4y - 16}{3}; -8; -\frac{20}{3}; -\frac{16}{3}; -4\)
28. \(t = \frac{d}{r}\)  29. 12 hours 30 minutes; 6 hours
15 minutes; 4 hours 10 minutes  30. \(P = \frac{I}{rt}\)
Lesson 4.2 (cont.)

22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 

35. 36. Summer Income

- Hours washing windows

- Hours mowing lawns

37. Travel Time

- Distance (miles)

- Time (hours)

38. 260 miles

Lesson 4.3

Practice B
1. 5 2. 2 3. -6 4. 6 5. -4 6. 3 7. -7 8. 8 9. -7/3 10. 9 11. -8 12. -3


y = -1.5x + 40
Lesson 4.3 (cont.)

19. 

20. 

21. 

22. 

23. 

24. 

25. 

26. 

27. 

28. \[4x + 5.5y = 440\]

29. 

30. Sample answer: (110, 0), (0, 80), (55, 40)

Lesson 4.3 (cont.)

31. 

32. 2 1-foot crates

Lesson 4.4

Practice B

1. negative 2. undefined 3. positive
4. zero 5. negative 6. positive 7. 6
8. \(-1\) 9. \(-3\) 10. 0 11. \(-5\)
12. undefined 13. 2 14. \(-\frac{3}{2}\) 15. \(\frac{1}{3}\) 16. 0
17. undefined 18. \(-\frac{5}{2}\) 19. 1 20. 7 21. 14
22. 2 23. 4 24. \(-8\) 25. 11 feet per second
26. 13 dollars per week 27. 0.8 cent per year
28. \(-6\) dollars per year
29. \(-139.5\) home runs per year
30. 134 home runs per year 31. 828 home runs per year
32. The six-year rate of change \(274\frac{1}{2}\) is the average of the three two-year rates of change.

Lesson 4.5

Practice B

1. yes; \(k = 5, m = 5\) 2. no
3. yes; \(k = \frac{3}{2}, m = \frac{1}{2}\)
4. \(k = 3, m = 2\) 5. \(k = -4, m = -4\)
Lesson 4.5 (cont')

6. \( k = 0.5, m = 0.5 \)  
7. \( k = -0.2, m = -0.2 \)

8. \( k = \frac{-2}{3}, m = \frac{-2}{3} \)  
9. \( k = \frac{1}{4}, m = \frac{1}{4} \)

10. \( y = 8x \)  
11. \( y = \frac{1}{3}x \)  
12. \( y = 3x \)

13. \( y = -4x \)  
14. \( y = \frac{-1}{2}x \)  
15. \( y = 1.6x \)

16. \( y = -1.5x \)  
17. \( y = 0.3x \)  
18. \( y = 1.6x \)

19. \( y = 64 \)  
20. \( y = 5 \)  
21. \( y = 32 \)

22. \( y = 15 \)  
23. \( C = 2\pi r; C = 5\pi \) when 
   \( r = 2.5 \)  
24. \( S = 8.2h; S = 328 \) when \( h = 40 \)

25. \( G = 6M; G = 51 \) gallons when 
   \( M = 8.5 \) minutes

26. \( F = s; F = 4 \) pounds when \( s = 4 \) inches

Lesson 4.6 (cont')

11. 
12. 

13. 
14. 

15. 
16. 

17. 
18. 

19. no 20. yes 21. no 22. yes 23. no 24. yes

Practice B

1. 7; 1  
2. -3; -4  
3. 0; -4  
4. 2; 3.2

5. \( \frac{1}{4}; \frac{3}{4} \) 
6. 3; 8

7. 
8. 

9. 
10. 

26. \( m = 2; \) the slope represents the rate at which 
   Howard increases his laps each week.

27.
Lesson 4.6 (cont.)

28. \( m = 0.05 \); the slope represents the amount the cost increases with each minute.
29. \( m = -1 \); the slope represents how much weight the wrestler loses each week.
30. \( w \)-intercept = 190; the \( w \)-intercept represents the wrestler's starting weight.

Lesson 4.7

Practice B
7. \( 5x - 4 = 0, y = 5x - 4 \)
8. \(-3x - 7 = 0, y = -3x - 7 \)
9. \( 4x - 20 = 0, y = 4x - 20 \)
10. \( 6x + 9 = 0, y = 6x - 9 \)
11. \(-16x + 5 = 0, y = -16x + 5 \)
12. \( -x + 12 = 0, y = x + 12 \)
13. \( 2 \)
14. \( 4 \)
15. \( -3 \)
16. \( -\frac{1}{3} \)
17. \( -2 \)
18. \(-4 \)
19. \(-10 \)
20. \( 1 \)
21. \( 7 \)
22. \(-1 \)
23. \( 160 \)
24. \( \frac{1}{4} \)
25. \( 6 \)
26. \( 3 \)
27. \(-12 \)
28. \( 16 \)
29. \( 280 \)
30. \( 10 \)
31. \( 2001 \)

Lesson 4.8

Practice B
1. yes 2. yes; any vertical line will pass through the graph only once.
3. no; the input value of 2 has many output values
4. no
5. yes; the domain is 3, 5, 7 and the range is 2, 4.
6. yes; the domain is 0, 2, 4, 6 and the range is -6, -4, -2, 0.
7. \( 1; -5; -3 \) 8. \( 20; 2; -10 \)
9. \( 1; -1; -\frac{7}{2} \)
10. \( 13.5; 12; 11 \)
11. \( 1; -1; -\frac{7}{2} \)
12. \( 3.8; 2; \frac{1}{2} \)

Lesson 5.1

Practice B
1. \( y = 2x + 3 \) 2. \( y = 5x \) 3. \( y = 4x - 3 \)
4. \( y = -5x + 1 \) 5. \( y = -3x - 2 \)
6. \( y = -5 \) 7. \( y = \frac{1}{2}x - 8 \) 8. \( y = -\frac{1}{3}x + 9 \)
9. \( y = -\frac{1}{4}x + 3 \) 10. \( y = \frac{1}{4}x - 7 \)
11. \( y = \frac{1}{3}x + \frac{2}{3} \) 12. \( y = -\frac{3}{4}x + \frac{7}{8} \)
13. \( y = x + 2 \) 14. \( y = -x + 3 \)
15. \( y = 2x + 4 \) 16. \( y = x - 4 \) 17. \( y = \frac{1}{2}x + 1 \)
18. \( y = -\frac{3}{4}x + 3 \) 19. \( y = 0.005x \)
20. \( 0.75, 7.5, 60, 1000 \) 21. \( y = 0.15x + 29 \)
22. \( $32.75, $36.50, $44, $59 \)

Lesson 5.2

Practice B
1. \( y = -x + 8 \) 2. \( y = 4x + 14 \)
3. \( y = -3x + 19 \) 4. \( y = 8 \) 5. \( y = 2x + 6 \)
6. \( y = -7x \) 7. \( y = -\frac{1}{3}x - 2 \) 8. \( y = \frac{1}{3}x + \frac{4}{3} \)
9. \( y = -\frac{3}{4}x + \frac{1}{2} \) 10. \( y = \frac{1}{3}x + \frac{1}{2} \)
11. \( y = -\frac{1}{3}x - \frac{2}{3} \) 12. \( y = \frac{2}{3}x + \frac{2}{3} \)
13. \( y = -x \)
14. \( y = 2 \) 15. \( x = 5 \) 16. \( y = 4x - 13 \)
17. \( y = -2x + 10 \) 18. \( y = \frac{2}{3}x + \frac{1}{2} \)
19. \( y = 27x + 186 \) 20. \( $429 \) 21. \( y = 21x + 4 \)
22. \( 151 \) stamps 23. \( w = 0.75n + 8 \)
24. \$8 per hour
Lesson 5.3

Practice B
1. \( y = x - 3 \)
2. \( y = -3x - 5 \)
3. \( y = 4x - 3 \)
4. \( y = -\frac{1}{3}x + 2 \)
5. \( y = 2x - 1 \)
6. \( y = -\frac{3}{2}x + 3 \)
7. \( y = 5x + 8 \)
8. \( y = -6x - 33 \)
9. \( y = \frac{3}{2}x - \frac{1}{3} \)
10. \( y = -3x + 14 \)
11. \( y = 2x + 4 \)
12. \( y = 5x + 31 \)
13. \( y = x - \frac{1}{2} \)
14. \( y = -0.5x - 0.64 \)
15. \( y = -\frac{17}{18}x + \frac{11}{10} \)
16. \( y = -\frac{1}{3} \)
17. \( y = \frac{2}{3} \)
18. \( y = \frac{4}{3} \)
19. Slope \( \overline{ZW} = -\frac{2}{3} \), slope \( \overline{ZY} = \frac{5}{2} \); \( \overline{ZW} \) and \( \overline{ZY} \) are perpendicular since \( -\frac{2}{3} \) is the negative reciprocal of \( \frac{5}{2} \). Slope \( \overline{XY} = -\frac{3}{4} \), slope \( \overline{YX} = \frac{3}{4} \); \( \overline{XY} \) and \( \overline{YX} \) are perpendicular since \( -\frac{3}{4} \) is the negative reciprocal of \( \frac{3}{4} \).
20. line through \( \overline{ZW} \): \( y = \frac{3}{2}x + \frac{16}{3} \); line through \( \overline{ZY} \): \( y = \frac{5}{2}x + 9 \); line through \( \overline{XY} \): \( y = -\frac{3}{4}x - \frac{11}{3} \).
21. line through \( \overline{ZW} \): \( y = -\frac{2}{3}x + \frac{14}{3} \); line through \( \overline{YX} \): \( y = -\frac{3}{2}x - \frac{11}{2} \); \( \overline{ZW} \) and \( \overline{YX} \) are parallel since their slopes are equal.
22. \( y = 60t - 20 \)

Lesson 5.4 (cont')

10. \( y = 2x + 3 \)

11. \( y = 180 - 2x \); 160 lb, 12. no; after one year the person would lose 104 pounds and would weigh less than 80 pounds.
13. \( y = \frac{3}{5}x + \frac{3}{2} \)
14. yes; it seems reasonable that it would continue.

Lesson 5.5

Practice B
1. \( y + 2 = 2(x + 1) \)
   or \( y = 2x \)
2. \( y - 1 = \frac{3}{5}(x - 2) \)
   or \( y = \frac{3}{5}x - \frac{3}{5} \)
3. \( y + 1 = -\frac{1}{3}(x + 3) \)
   or \( y = -\frac{1}{3}x - 1 \)
4. \( y - 24 = -2(x + 3) \)
5. \( y + 2 = -5(x + 4) \)
6. \( y + 3 = \frac{5}{3}x \)
7. \( y + 5 = -4(x - 6) \)
8. \( y - 1 = 0 \)
9. \( y + 5 = 6(x + 3) \)
10. \( y - 5 = -2x \)
    or \( y - 3 = -2(x - 1) \)
11. \( y - 4 = -\frac{1}{2}(x - 2) \)
    or \( y = -\frac{1}{2}x + 1 \)
12. \( y = x - 3 \)
    or \( y + 3 = x \)
13. \( y + 2 = \frac{3}{2}(x - 6) \)
    or \( y = \frac{3}{2}x - 6 \)
14. \( y - 1 = \frac{3}{2}(x - 4) \)
    or \( y + 3 = \frac{3}{2}(x + 2) \)
15. \( y - 3 = x - 1 \)
    or \( y + 3 = x + 5 \)
16. \( y + 7 = -\frac{3}{2}(x + 5) \)
    or \( y + 10 = -\frac{3}{2}(x + 3) \)
17. \( y - 11 = \frac{9}{2}(x - 6) \)
    or \( y - 2 = \frac{9}{2}(x + 1) \)
18. \( y - 4 = \frac{12}{5}(x - 2) \)
    or \( y + 8 = \frac{12}{5}(x + 3) \)

1-3. Answers will vary.
4-14. Sample answers are given.
4. \( y = 2x + 2 \)
5. \( y = -2x \)
6. \( y = -\frac{3}{2}x - 3 \)
7. \( y = x - 5 \)
8. \( y = -2x + 1 \)
9. \( y = -x + 6 \)
Lesson 5.5 (cont.)

19. \( y = 5x + 6 \)  20. \( y = -2x + 1 \)
21. \( y = 3x - 7 \)  22. \( y = -3x + 16 \)
23. \( y = \frac{1}{3}x - 12 \)  24. \( y = 4x + \frac{7}{3} \)
25. \( y = 1.5x + 2 \)  26. \$11  27. \( y = 7x \)
28. about 9:46 A.M.

Lesson 5.6

Practice B
1. \( 2x - y = 8 \)  2. \( 3x - 4y = 75 \)
3. \( -3x + y = 2 \)  4. \( 3x + y = 5 \)
5. \( 6x - 21y = 18 \)  6. \( 2x - 3y = 5 \)  7. \( x = 4 \)
8. \( y = 4 \)  9. \( 10x - 3y = 45 \)
10. \( x - 8y = -12 \)  11. \( -x + 2y = 8 \)
12. \( -2x + 3y = -5 \)  13. \( -2x + y = -5 \)
14. \( 4x + y = 9 \)  15. \( -3x + y = 6 \)
16. \( 6x + y = -8 \)  17. \( -x + 3y = -30 \)
18. \( x + 2y = 6 \)  19. \( -3x + y = -7 \)
20. \( 3x + y = -1 \)  21. \( x + 8y = 17 \)
22. \( -5x + y = 15 \)  23. \( -x + 2y = -6 \)
24. \( x + 3y = 12 \)  25. \( y = -4, x = 3 \)
26. \( y = 1, x = 5 \)  27. \( y = -2, x = -3 \)
28. \( y = -4, x = 0 \)  29. \( 2x + 3y = 60 \)
30. \( y = -\frac{2}{3}x + 20 \)

31. Party Food

32. 20, 16, 12, 8, 0

33. \( 4x + 6y = 48 \)  34. \( y = -\frac{7}{3}x + 8 \)
35. Levee Seed

36. 8, 6, 4, 2, 0

Lesson 5.7

Practice B
1. yes  2. no  3. yes  4. no  5. yes  6. no
7. about $28,100  8. about $61,700
9. Chemical Workers Salaries

10-12. Sample answers are given.
10. \( S = 1150t + 16,500 \)  11. about $29,150
12. about $36,050  13. Whole Milk Consumption

14-16. Sample answers are given.
14. \( W = -4.6t + 140 \)  15. 75.6  16. 52.6

Lesson 6.1

Practice B
1. \( x < 1 \)  2. \( x \geq 4 \)  3. \( x \leq -2 \)  4. \( x \geq -5 \)
5. \( -4 \)  6. 5  7. 8  8. 9  9. 10

11. \( x < 4; \)  12. \( x \leq 7; \)
13. \( x > 2; \)  14. \( x \leq -4; \)
15. \( x < 2; \)  16. \( x < 4; \)
Lesson 6.1 (cont)

17. \( x \geq -6; \)
18. \( x < 6; \)
19. \( x \geq 3; \)
20. \( x > -9; \)
21. \( x \geq 18; \)
22. \( x > 4.5; \)
23. \( x \leq -5; \)
24. \( x \geq -6.1; \)
25. \( x > -11.5; \)
26. \( T > 98.6; \)
27. \( b > -268.9; \)
28. \( m \geq 32; \)
29. \( x \geq 26; 26; \)
30. \( E \geq -282; \)

Lesson 7.1

Practice B
1. yes; no 2. no; no 3. no; yes 4. yes; no
5. yes; no 6. no; no 7. \((6, -2)\) 8. \((-3, 3)\)
9. \((-10, 14)\) 10. 

Lesson 7.2

Practice B
1. \( y = -5x - 8 \) 2. \( y = 6x - 4 \)
3. \( x = -3y + 7 \) 4. \( x = 2y - 4 \)
5. \( y = -x - 3 \) 6. \( x = 10y + 6 \)
7. 9. Answers may vary. 10. \((4, 7)\)
11. \((4, -7)\) 12. \((3, -2)\) 13. \((-5, 4)\)
14. \((-4, -14)\) 15. \((-3, 14)\) 16. \((2, 2)\)
17. \((4, -2)\) 18. \((2, 1)\) 19. \((-3, 2)\)
20. \((6, -1)\) 21. \((-22, 10)\)
Lesson 7.2 (cont.)

22. Number of households mow for $x$ (households)
   Number of households shovel for $y$ (households)
   Total number of households = 10 (households)
   Earnings per household mowing = 200 (dollars)
   Earnings per household shoveling = 180 (dollars)
   Total earnings = 1880 (dollars)
   $x + y = 10$
   $200x + 180y = 1880$
(4, 6); You mowed for 4 households and shoveled for 6 households.

23. 5 cm; 6 cm

Lesson 7.3

Practice B

1. (9, 2)  2. (-6, -7)  3. (-2, 2)
4. (1, -3)  5. (-2, 2)  6. (-1, -4)
7. (3, -3)  8. (-5, -5)  9. (8, 3)  10. (0, 1)
11. (-3, 2)  12. (-2, 0)  13. (-2, 3)
14. (-5, -1)  15. (-3, 6)  16. (4, 6)
17. (-6, 0)  18. (-1, 9)
19. $y = 50 + 36x$
   $y = 35 + 39x$
20. (5, 230)

21. If labor required is less than 5 hours, use Business B and if labor required is more than 5 hours, use Business A.

22. $3x + 2y = 518$
   $5x + 4y = 907$
23. (129, 65.5)

24. $x + y = 16$
   $200x + 165y = 2745$
25. (3, 13)

Lesson 7.4

Practice B

1. (6, -4)  2. (6, 2)  3. (-1, 4)  4. (2, 1)
5. (4, 3)  6. (20, 30)  7. (2, -1)
8. (-10, 3)  9. (-1, -7)  10. (3, 3)
11. (0, -2)  12. (1, 2)  13. (-4, -4)
14. (5, -2)  15. (-2, -4)  16. (-1/2, 0)
17. (-1/3, 1)  18. (-4, -6)
19. $x + y = 8$
   $1.89x + 5.19y = 31.62$

21. 9 right-handed gloves and 3 left-handed gloves
22. 5 people order the chicken dinner and 1 person orders the steak dinner.

23. The width is 4 inches and the length is 6.5 inches.

Lesson 7.5

Practice B

1. E: exactly one solution  2. A: no solution
3. C: infinitely many solutions
4. B: exactly one solution
5. F: infinitely many solutions  6. D: no solution
7. no solution  8. infinitely many solutions  9. exactly one solution (2, -5)
10. exactly one solution (-1/3, 1)
11. infinitely many solutions  12. no solution
13. no solution  14. no solution
15. no solution  16. no solution
17. exactly one solution (3, -1)
18. no solution

19. [Graphs showing revenue and cost over time]

Revenue: $y = 50x + 50$
Cost: $y = 50x + 25$

20. The profit was constant.