Chapter 1 Ratios and Proportional Reasoning

Page 6  Chapter 1  Are You Ready?
1. \( \frac{2}{15} \)  3. \( \frac{1}{51} \)  5. No; \( \frac{12}{20} = \frac{3}{5} \) or \( \frac{15}{30} = \frac{1}{2} \)

Pages 13–14  Lesson 1-1  Independent Practice
1. 60 mi/h  3. 3.5 m/s  5. Sample answer: about $0.50 per pair
7. 510 words  a. 20.04 mi/h  b. about 1.5 h
13. Sometimes; a ratio that compares two measurements with different units is a rate, such as \( \frac{2 \text{ miles}}{10 \text{ minutes}} \).
15. $6.40; Sample answer: The unit rate for the 96-oz container is $0.05 per ounce. So, 128 ounces would cost $0.05 \times 128 or $6.40.

Pages 15–16  Lesson 1-1  Extra Practice
17. 203.75 Calories per serving  19. 32 mi/gal
21. $108.75 ÷ 15 = $7.25, $7.25 \times 18 = $130.50
23. Hours Worked | Amount Earned ($) | Earnings per hour ($) | Highest Hourly Rate?
| Caleb  | 5 | 36.25 | 7.25 |
| Jeremy | 7.5 | 65.25 | 8.70 | ✓
| Rosa   | 8  | 54.00 | 6.75 |
| Maria  | 4.25 | 34.00 | 8.00 |

25. \( \frac{2}{7} \)  27. \( \frac{2}{3} \)

Pages 21–22  Lesson 1-2  Independent Practice
1. 1 1/2  3. \( \frac{4}{27} \)  5. \( \frac{2}{25} \)  7. $6 per yard
11. 39 \( \frac{3}{250} \)  13. 11 \( \frac{1}{200} \)  15. Sample answer: if one of the numbers in the ratio is a fraction, then the ratio can be a complex fraction. \( \frac{1}{2} \)  19. 12 1/2 mph

Pages 23–24  Lesson 1-2  Extra Practice
21. 20  23. 2  25. \( \frac{3}{2} \) or \( \frac{1}{1} \frac{1}{2} \)  27. 3,000 square feet per hour
29. \( \frac{31}{400} \)  31. Sample answer: Set 1 1/4 over 100. Write 1 1/4 as an improper fraction. Then divide the numerator by the denominator.

33. Rider | Speed (mph)
| Slowest | Julio | 8 1/6 |
| Elena   | 9 1/9 |
| Kevin   | 12 2/5 |
| Fastest | Lorena | 14 1/4 |

35. 10,000  37. 100  39. 1,000

Pages 37–38  Lesson 1-4  Independent Practice
1. 115 mi/h  3. 322,000 m/h  5. 6.1 mi/h
7. 7,200 Mb/h  9. 500 ft/min; Sample answer: All of the other rates are equal to 60 miles per hour.
11. 461.5 yd/h

Pages 31–32  Lesson 1-3  Extra Practice
13. 1,760  15. 66  17. 35.2
19a. 6.45 ft/s  19b. 2,280 times  19c. 0.11 mi  19d. 900,000 times
21. Animal | Top Speed (mph)
| Cheetah  | 70 |
| Elk      | 45 |
| Lion     | 50 |
| Quarter Horse | 55 |

23. yes; Since the unit rates are the same, \( \frac{1 \text{ poster}}{3 \text{ students}} \), the rates are equivalent.

Pages 37–38  Lesson 1-4  Independent Practice
1. Time (days) | Water (L)
| 1          | 225 |
| 2          | 450 |
| 3          | 675 |
| 4          | 900 |

Yes; the time to water ratios are all equal to \( \frac{1}{225} \).
3. The table for Desmond’s Time shows a proportional relationship. The ratio between the time and the number of laps is always 73.
5. a. yes; Sample answer:

<table>
<thead>
<tr>
<th>Side Length (units)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimeter (units)</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

The side length to perimeter ratio for side lengths of 1, 2, 3, and 4 units is \( \frac{1}{4} \), \( \frac{1}{4} \frac{2}{8} \), \( \frac{1}{4} \frac{3}{12} \), or \( \frac{1}{4} \frac{4}{16} \). Since these ratios are all equal to \( \frac{1}{4} \), the measure of the side length of a square is proportional to the square’s perimeter.
Selected Answers

b. no; Sample answer:

<table>
<thead>
<tr>
<th>Side Length (units)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (units²)</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>16</td>
</tr>
</tbody>
</table>

The side length to area ratio for side lengths of 1, 2, 3, and 4 units is $\frac{1}{1}$ or 1, $\frac{2}{4}$ or 0.5, $\frac{3}{9}$ or 0.33, $\frac{4}{16}$ or 0.25. Since these ratios are not equal, the measure of the side length of a square is not proportional to the square’s area.

7. It is not proportional because the ratio of laps to time is not consistent; $\frac{4}{1} \neq \frac{6}{2} \neq \frac{8}{3} \neq \frac{10}{4}$.

9. Sample answer: At Beautiful Bouquet, there are always 2 red flowers for every 8 pink flowers in a bouquet. At All Occasions Flowers, there are always 3 more pink flowers than red flowers in a bouquet. The bouquet for Beautiful Bouquet is a proportional relationship, while the bouquet for All Occasions Flowers is nonproportional.

Pages 39–40  Lesson 1-4  Extra Practice

11.

<table>
<thead>
<tr>
<th>Degrees Celsius</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degrees Fahrenheit</td>
<td>32</td>
<td>50</td>
<td>68</td>
<td>86</td>
</tr>
</tbody>
</table>

No; the degrees Celsius to degrees Fahrenheit ratios are not all equal. 13a. No; the fee to ride tickets ratios are not equal. 13b. no; Sample answer: The fee increase is inconsistent. The table shows an increase of $4.50 from 5 to 10 tickets, an increase of $4 from 10 to 15 tickets, and an increase of $2.50 from 15 to 20 tickets. 15a. yes 15b. no 15c. no 17. 20 19. 12 21. 3

Page 43  Problem-Solving Investigation  The Four-Step Plan

Case 3. $360  Case 5. Add 2 to the first term, 3 to the second, 4 to the third, and so on; 15, 21, 28.

Pages 49–50  Lesson 1-5  Independent Practice

Not proportional; The graph does not pass through the origin. 13a. Yes 13b. No 13c. Yes

Plant B; The graph is a straight line through the origin. 5. Proportional; Sample answer: The ordered pairs would be (0, 0), (1, 35), (2, 70). This would be a straight line through the origin.

Pages 51–52  Lesson 1-5  Extra Practice

Not proportional; The graph does not pass through the origin.

Pages 59–60  Lesson 1-6  Independent Practice

140 3.5 5. $\frac{2}{5} = \frac{x}{20}; 8$ ounces 7. $c = 0.50;p;$ $4.00$

9. $\frac{360}{3} = \frac{n}{7}; 840$ visitors 11. 256 c; Sample answer: The ratio of cups of mix to cups of water is 1:8, which means that the proportion $\frac{1}{8} = \frac{32}{x}$ is true and can be solved. 13. 18

15. Sample answer: The product of the length and width is
constant. The length is not proportional to the width. The proportions are not equal.

**Pages 61–62 Lesson 1-6 Extra Practice**

17. 7.2  
19. \( \frac{6}{7} = \frac{c}{40} \); about 34 patients  
21. \( s = 45w \); $360  
23. 11.25 c  
25. No; sample answer:  
27. 20 mi/gal

**Pages 69–70 Lesson 1-7 Independent Practice**

1. 6 m per s  
3. $9 per shirt; Sample answer: The point (0, 0) represents 0 T-shirts purchased and 0 dollars spent. The point (1, 9) represents 9 dollars spent for 1 T-shirt.  
5. 10 inches per hour  
7. Sample answer:  
9. \( x = 8 \), \( y = 16 \), \( z = 24 \)

**Pages 71–72 Lesson 1-7 Extra Practice**

11. $0.03 per minute  
13. Josh; sample answer: The unit rate for Ramona is $9 per hour. The unit rate for Josh is $10 per hour.  
15. 195 mi

**Pages 77–78 Lesson 1-8 Independent Practice**

1.  
13. \( d \)

**Pages 79–80 Lesson 1-8 Extra Practice**

9.  
11.  
13.  
15. Yes; sample answer:  
17. No; sample answer:  
19. Yes; sample answer:  

3. a. It shows that car A travels 120 miles in 2 hours.  
b. It shows that car B travels 67.5 miles in 1.5 hours.  
c. the speed of each car at that point  
d. the average speed of the car  
e. Car A; the slope is steeper.  
5. Marisol found \( \frac{\text{run}}{\text{rise}} \). Her answer should be \( \frac{3}{2} \).  
7. no; Sample answer: the slope of \( \overline{AB} \) is \( \frac{0-1}{1-5} \) or \( \frac{-1}{-4} \) and the slope of \( \overline{BC} \) is \( \frac{-3-0}{-3-1} \) or \( \frac{3}{4} \). If the points were on the same line, the slopes would be equal.
Chapter 2 Percents

Page 98 Chapter 2 Are You Ready?

1. 48  3. $70  5. 72.5%  7. 92%

Pages 107–108 Lesson 2-1 Independent Practice

1. 120.9  3. $147.20  5. 17.5  7. 30.1  9. $7.19 at Pirate Bay, $4.46 at Funtopia, $9.62 at Zoomland 13. 4

Pages 109–110 Lesson 2-1 Extra Practice

25. 45.9  27. 14.7  29. $54  31. 0.3  33. 2.25  35. $19.95  37. 92 customers  39. 91.8  41. 133.92

Pages 115–116 Lesson 2-2 Independent Practice

1. Sample answer: 35

3. Sample answer: $70

5. Sample answer: 72.5%

7. Sample answer: 92%

9. Sample answer: 18

11. Sample answer: about 96 mi; 0.01 · 12000 = 120 and 0.01 · 12000 = 120

13. Sample answer: 6

15. Sample answer: about 96 mi; 0.01 · 12000 = 120 and 0.01 · 12000 = 120

17a. Sample answer: about 260 canned foods; 200 + 0.3 · 200  17b. Sample answer: about 780 canned foods; 600 + 0.3 · 600  19. sometimes; Sample answer: one estimate for 37% of 60 is $\frac{2}{5} \cdot 60 = 24$. 

Pages 85–86 Lesson 1-9 Independent Practice

1. 30 lb per bag

3. |
| Time (h) | 1 | 2 | 3 | 4 |
| Charge ($) | 75 | 100 | 125 | 150 |

No; sample answer: $\frac{75}{1} \neq \frac{100}{2}$; Because there is no constant ratio and the line does not go through the origin, there is no direct variation. 

15. Sample answer: 9; $\frac{5}{2}$; 36; 22

23. Sample answer: 3.5 cm

6.3 cm

19.6 cm

Pages 87–88 Lesson 1-9 Extra Practice

17. 7 c

19. yes; 0.2

21a. No  21b. Yes  21c. Yes  21d. No

23. |
| Number of Sheets | 1 | 2 | 3 | 4 | 5 |
| Number of Packages | 214 | 350 | 500 | 750 | 1000 |

Page 91 Chapter Review Vocabulary Check

1. rate  3. ordered  5. complex  7. slope  9. proportion  11. Dimensional

Page 92 Chapter Review Key Concept Check

1. denominator  3. vertical change to horizontal change
Pages 117–118  Lesson 2-2  Extra Practice
21. Sample answer: 135
23. Sample answer: 90
\[ \frac{9}{10} \cdot 100 = 90 \]
\[ 0.1 \cdot 100 = 10 \text{ and } 9 \cdot 10 = 90 \]
25. Sample answer: 0.7
\[ 0.01 \cdot 70 = 0.7 \]
27. Sample answer: about 12 muscles; \[ \frac{3}{10} \cdot 40 = 12 \]
29a. Sample answer: 420; \[ \frac{7}{10} \cdot 600 = 420 \]
29b. Greater; both the number of passes and the percent were rounded up.
29c. Tony Romo; sample answer: 64% of 520 must be greater than 64% of 325.

Pages 125–126  Lesson 2-3  Independent Practice
1. 25%  2. 36%  3. 768  4. 80  5. 0.2%
13a. about 34%  13b. about 24,795.62 km  13c. about 6,378.16 km
15. 20% of 500, 20% of 100, 5% of 100; If the percent is the same but the base is greater, then the part is greater. If the base is the same but the percent is greater, then the part is greater.

Pages 127–128  Lesson 2-3  Extra Practice
17. 45  19. 20  21. 20%  22. 8 pencils; 0.25 \times 8 = 2
25. 120%  27. 60%  29. \[ \frac{1}{3} \]  31. \[ \frac{1}{2} \]  33. \[ \frac{2}{5} \]

Pages 133–134  Lesson 2-4  Independent Practice
1. 75 = n \times 150; 50%  3. p = 0.65 \cdot 98; 63.7  5. p = 0.24 \cdot 25; 6
7. 50 books  9a. 37%  9b. 31%  11. p = 0.004 \cdot 82.1; 0.3
13. 230 = n \times 200; 115%  15. Sample answer: If the percent is less than 100%, then the part is less than the whole; if the percent equals 100%, then the part equals the whole; if the percent is greater than 100%, then the part is greater than the whole.
17. Sample answer: It may be easier if the percent and the base are known because after writing the percent as a decimal or fraction, the only step is to multiply. When using the percent proportion, you must first find the cross products and then divide.

Page 139  Problem-Solving Investigation  Determine Reasonable Answers
Case 3. no; Sample answer: 48% – 24% = 24% and 24% of 140 is about 35  Case 5. 15 + b = 0.5(36 + b); 6 boys; 42 students

Pages 147–148  Lesson 2-5  Independent Practice
1. 20% increase  3. 25% increase  5. 41% decrease  7. 28%  9. 38% decrease  11a. 100%  11b. 300%
13. about 4.2%  15. He did not write a ratio comparing the change to the original amount. It should have had a denominator of $52 and the percent of change would be about 140%.

Pages 149–150  Lesson 2-5  Extra Practice
17. 50%; decrease  19. 33% increase  21a. about 3.8%; decrease  21b. about 2.9%; decrease
23. 25%  25. Monica; 2%  27. 3.75  29. $75.14

Pages 155–156  Lesson 2-6  Independent Practice
1. $69.60  3. $1,605  5. $35.79  7. $334.80  9. $10.29
11. 7%  13. $54, $64.80; The percent of gratuity is 20%. All of the other pairs have a gratuity of 15%. 15. False; Sample answer: An item costs $25 and you want to mark it up 125%. Multiply $25 by 125% or 1.25. The new price is $25 + $31.25 or $56.25

Pages 163–164  Lesson 2-7  Independent Practice
1. $51.20  3. $6.35  5. $4.50  7a. $28.76, $25.29, $28.87  7b. Funtopia 9. $9.00
11. Sample answers are given.

Pages 165–166  Lesson 2-7  Extra Practice
15. $102.29  17. $169.15  19. Mr. Chang; $22.50 < $23.99
21. washing machine, dryer, chest freezer  23. 29%; increase 25. 35%; decrease

Pages 171–172  Lesson 2-8  Independent Practice
1. $38.40  3. $5.80  5. $1,471.50  7. $75.78  9a. 5%
b. Yes; he would have $5,208.
11. Sample answer: If the rate is increased by 1%, then the interest earned is $60 more. If the time is increased by 1 year, then the interest earned is $36 more. 13. Investment A; Sample answer: Investment A has a balance of $2,850 after 30 years and Investment B has a balance of $2,512.50 after 15 years.
Selected Answers

Pages 173–174  Lesson 2-8  Extra Practice

Page 179  Chapter Review  Vocabulary Check
Down
1. increase  3. markdown  5. selling  7. discount  9. sales tax
Across
11. interest

Page 180  Chapter Review  Key Concept Check
1. 300  3. 18  5. 12

Chapter 3  Integers

Page 190  Chapter 3  Are You Ready?
1. 6  3. 24
5–9.

Page 195–196  Lesson 3-1  Independent Practice
1. 9  3. –53
7. 10  8. 11  13. $299.97; |−200| + |−40| + |−60| = 200 + 40 + 60 = 300  15. always; It is true if A and B are both positive or if A or B is negative, and if both A and B are negative.  17a. Always; the absolute value of a number and its opposite are equal.  17b. Sometimes; the expressions are equal when x = 0.  17c. Sometimes; the expressions are equal when x = 0.

Pages 197–198  Lesson 3-1  Extra Practice
19. 12
21. 23. 11  25. 25  27. 5  29a. True  29b. True  29c. True  29d. False  31. (−2, 4); II  33. (−3, −1); III

Page 207–208  Lesson 3-2  Independent Practice
1. –38  3. 16  5. –12  7. 30  9. –4  11 green: profit of $1; white: profit of $3; black: profit of $3  13. Sample answer: In science, atoms may contain 2 positive charges and 2 negative charges. In business, a stock’s value may fall 0.75 one day and rise 0.75 the next day.  15. a  17. m + (−15)

Pages 209–210  Lesson 3-2  Extra Practice
19. 13  21. –6  23. 15  25. 22  27. –19  29. –5 + (−15) + 12; The team has lost a total of 8 yards.  31a. Yes  31b. No  31c. Yes

Pages 219–220  Lesson 3-3  Independent Practice
1. –10  3. –12  5. –30  7. 23  9. 104  11. 0
15a. a. 2,415 ft  15b. 3,124 ft  15c. 627 ft  15d. 8 ft  15e. 15
17. Sample answer: –5 – 11 = –5 + (−11) = −16; Add 5 and 11 and keep the negative sign.  19. He did not find the additive inverse of −18. −15 − (−18) = −15 + 18 or 3. The correct answer is 3.  21. Sample answer: The temperature of a deep freezer was −15°F. When the lid was opened, it lost −7°F. What was the resulting temperature after the lid was opened? −15 − (−7) = −8; −8°F

Pages 221–222  Lesson 3-3  Extra Practice
23. 35  25. –14  27. 6  29. 15  31. 11  33. 1

Page 227  Problem-Solving Investigation  Look for a Pattern
Case 3. Add the previous 2 terms; 89, 144
Case 5. 13 toothpicks

Pages 237–238  Lesson 3-4  Independent Practice
1. –96  3. 36  5. –64  7. 5(−560); −3,250; Ethan burns 3,250 Calories each week.  9. 5 black T-shirts

Sample answer: When you multiply a negative and a positive integer, the product is negative. When you multiply two negative integers the product is positive.  13. Sample answer: Evaluate −7 + 7 first. Since −7 + 7 = 0, and any number times 0 is 0, the value of the expression is 0.  15. −3 and 7

SA6  Selected Answers
Chapter 4 Rational Numbers

Page 260 Chapter 4 Are You Ready?

1. $\frac{2}{3}$
2. $\frac{8}{11}$

Page 267–268 Lesson 4-1 Independent Practice

1. $0.5$
2. $0.125$
3. $-0.66$
4. $7.5875$
5. $-0.8$
6. $-0.72$
7. $\frac{1}{5}$
8. $\frac{52}{45}$
9. $10 \text{ cm}$

Page 269–270 Lesson 4-1 Extra Practice

1. $-7.05$
2. $5.3$
3. $-9.10$
4. $-1.24$
5. $-12.5$
6. $0.1$

Page 275–276 Lesson 4-2 Independent Practice

1. $>$_

Page 277–278 Lesson 4-2 Extra Practice

17. $=\$

Page 287–288 Lesson 4-3 Independent Practice

1. $1 \frac{4}{7}$
2. $-\frac{2}{3}$
3. $-\frac{1}{2}$
4. $\frac{7}{14}$
5. $\frac{33}{100}$
6. $67$

Page 289–290 Lesson 4-3 Extra Practice

17. $-\frac{12}{3}$
19. $\frac{1}{4}$
21. $\frac{1}{9}$
23. $1 \frac{47}{100}$
25. $\frac{1}{2}$
27. $1 \frac{3}{8}$

Page 295–296 Lesson 4-4 Independent Practice

13. $\frac{1}{24}$
15. $\frac{1}{5}$
17. $\frac{26}{45}$
19. $\frac{11}{18}$

Copyright © McGraw-Hill Education
**Selected Answers**

### Pages 297–298 Lesson 4-4 Extra Practice

19. \( \frac{19}{30} \)  
21. \( \frac{11}{20} \)  
23. -\( \frac{13}{24} \)  
25. Subtraction; Sample answer: To find how much more turkey Makalaya bought, subtract \( \frac{1}{a} \) from \( \frac{3}{8} \) lb.  
27. Theresa did not rename the fractions using the LCD. \( \frac{5}{20} + \frac{12}{20} = \frac{17}{20} \)  
29a. False  
29b. True  
29c. True

### Pages 303–304 Lesson 4-5 Independent Practice

1. \( \frac{9}{6} \)  
3. \( \frac{8}{5} \)  
5. \( \frac{7}{5} \)  
7. \( \frac{4}{15} \)  
9. \( \frac{4}{3} \)  
11. Subtraction; the width is shorter than the length; \( \frac{13}{4} \) ft

13. -5  
15. \( \frac{13}{9} \)  
17. Sample answer: A board with a length of \( \frac{3}{4} \) ft needs to be cut from a \( \frac{5}{1} \) ft existing board. How much wood will be left after the cut is made?; \( \frac{15}{8} \) ft

19. Sample answer:

![Diagram](image)

### Pages 305–306 Lesson 4-5 Extra Practice

21. \( 18 \frac{17}{24} \)  
23. \( 7 \frac{5}{7} \)  
25. \( 5 \frac{7}{8} \)  
27. Subtraction twice; the amount of flour is less than the original amount; \( \frac{2}{3} \) c

29. \( \frac{7}{8} \) yd  
31. \( \frac{3}{12} \)  
33. \( \frac{5}{8} \)  
35. 14 mi; Sample answer: \( \frac{6}{5} \) mi  
37. 84 movies

### Pages 309 Problem-Solving Investigation Draw a Diagram

Case 3. \( \frac{3}{8} \)  
Case 5. \( \frac{2}{5} \) mi

---

### Pages 315–316 Lesson 4-6 Independent Practice

1. \( \frac{3}{32} \)  
3. \( -\frac{4}{12} \)  
5. \( \frac{1}{6} \)  
7. \( \frac{2}{8} \)  
9. -1  
11. \( \frac{1}{16} \)

13. \( \frac{1}{3} \times \left( \frac{11}{16} \right) = \frac{11}{48} \)  
15. Sample answer: Three fourths of the students at Walnut Middle School were on the honor roll. Of that group, only \( \frac{1}{8} \) of them received all As. What fraction of the students received all As?  
17a. Sample answer: \( \frac{1}{2} \times \frac{2}{3} = \frac{1}{2} \) or \( \frac{1}{3} \)  
17b. Sample answer: \( \frac{3}{4} \times \frac{2}{3} = \frac{12}{20} \) or \( \frac{3}{5} \)

---

### Pages 323–324 Lesson 4-7 Independent Practice

1. \( 12.7 \)  
3. \( 128.17 \)  
5. 0.04  
7. 15.75  
9. 1.5

11. 887.21 mL  
13. 1.5 lb  
15. 1,000 mL or 1 L

17. 0.031 m, 0.1 ft, 0.6 in., 1.2 cm  
19. 0.7 gal, 950 mL, 0.4 L, \( \frac{1}{2} \) c  
21. 5.4 cm; 6.7 cm

---

### Pages 325–326 Lesson 4-7 Extra Practice

23. 158.76  
25. 121.28  
27. 41.89  
29. 2 L  
31. 3 gal

33. 4 mi  
35. 15.2 cm; 0.152 m

---

### Pages 331–332 Lesson 4-8 Independent Practice

1. \( \frac{7}{16} \)  
3. \( \frac{3}{15} \)  
5. \( \frac{2}{9} \)  
7. 84 movies

9. \( \frac{1}{4} \)

Sample answer: The model on the left shows that one half of a rectangle with ten sections is five sections. Two fifths of ten sections is four sections. The model on the right shows the five sections divided into \( \frac{1}{2} \) groups of four sections

11. \( \frac{1}{6} \) of a dozen; 2 folders  
13. \( \frac{10}{3} \)

---

### Pages 333–334 Lesson 4-8 Extra Practice

15. \( \frac{2}{3} \)  
17. \( -\frac{7}{5} \)  
19. 11 servings  
21. \( \frac{1}{2} \)  
23. 13 bracelets

25. \( \frac{9}{20} \)  
27. \( \frac{46}{63} \)  
29. \( \frac{3}{4} \) ft

---

### Page 337 Chapter Review Vocabulary Check

1. bar notation  
3. common denominator  
5. terminating

---

### Page 338 Chapter Review Key Concept Check

1. \( \frac{3}{5} \)  
3. denominator  
5. multiply
Chapter 5 Expressions

Page 348  Chapter 5 Are You Ready?
1. 16  3. 16  5. -50  7. -25

Pages 353–354 Lesson 5-1 Independent Practice
1. 59  3. 5  5. 2  9. -1  30. 50 + 0.17m; $75.50 13. 9.1  15. 37.85  17. Sample answer: The fee to rent a bicycle is $10 plus $5 for each hour. The expression 5x + 10 represents the total cost for renting a bicycle for x hours. 19. Sample answer: 2n + 4; 2(n + 2)

Pages 355–356 Lesson 5-1 Extra Practice
21. 4  23. -12  25. 5  27. $8.75 29a. True 29b. False 29c. True 31. Let p = the number of hours Paiva worked; p + 8. 33. Let n = Nathan’s age; n - 3

Pages 361–362 Lesson 5-2 Independent Practice
1. 7 is added to the previous term; 28, 35, 42  3. 8 is added to the previous term; 58, 66, 74  5. 0.8 is added to the previous term; 5.6, 6.4, 7.2  7. 3n; 36 in.
9a. 
<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>
9b. 3n
9c.

Sample answer: The number of boxes increases by 3 each minute. The points appear to fall in a straight line passing through the origin. 9d. 135 boxes 11. + 1, + 2, + 3, + 4, ...; 16, 22, 29 13. 81; Sample answer: The multiples of 6 from 41 to 523 can be represented by the sequence 42, 48, 54, ... 522. The expression 6n + 36 represents this sequence. When n = 81, the value of the expression is 522. So, the 81st term of the sequence is 522. There are 81 multiples of 6 between 41 and 523.

Pages 363–364 Lesson 5-2 Extra Practice
15. 10 is added to the previous term; 46, 56, 66 17. 1.5 is added to the previous term; 10.5, 12.0, 13.5 19. 4 is added to the previous term; 20.6, 24.6, 28.6 21. 25 is added to the previous term; 120, 145, 170 23a. Each figure is 8 less than the previous figure. 23b. True 27b. True 27c. False

Pages 371–372 Lesson 5-3 Independent Practice
1. Commutative (+) 3. Associative (+) 5. false; Sample answer: (24 ÷ 4) ≠ 24 ÷ (4 ÷ 2) 7. = (15 + 12) + 8a = 27 + 8a
9. = 3x • (x • 7) Commutative (×) = (3 • x) • 7 Associative (×) = 3x² • 7 Simplify. = 3 • 7 • x² Commutative (×) = (3 • 7) • x² Associative (×) = 21x² Simplify.
11. [7 + (47 + 3)][5 • (2 • 3)], Associative (+); [7 + 50][5 • (2 • 3)], Simplify; 57[5 • (2 • 3)], Associative (×); 57 • 10, 3, Simplify; (57 • 10, 3, Associative (×); 57 • 3, Simplify; 1,710 13. Blake incorrectly multiplied both the 5 and m by 4. He should have used the Associative Property to group the 5 and 4 together, simplify, and then multiply by m. 4 • (5 • m) = 20m 15a. no; Sample answer: 2 - 3 = -1 and -1 is not a whole number 15b. no; Sample answer: 1 + 1 = 2 and 2 is not a member of the set.

Pages 373–374 Lesson 5-3 Extra Practice
17. Commutative (×) 19. Associative (+) 21. 48 s; Sample answer: 12.4 + 12.6 = 25 and 11.8 + 11.2 = 23, 25 + 23 = 48 23. = (18 + 5) + 6m Associative (+) = 23 + 6m Simplify.
25. = 10 • 7 • y Commutative (×) = (10 • 7) • y Associative (×) = 70y Simplify.
27. 2(2.29) + 2(2.21) + 2.50 + 2(2.29) + 2.50 + 2(2.21); 2.50 + 2(2.21) + 2.29 29. 36 31. 226 33. 74 35. $1.25(3) + $0.45(2); $4.65

Pages 379–380 Lesson 5-4 Independent Practice
1. 33 3. -30 5. 4 7. -12x + 24 9. 30 - 6q 11. -15 + 3b 13. $27.40; 4($7.00 - $0.15) = 4 • 7 - 4 • 0.15
15. 315; 9(30 + 5) = 9(30) + 9(5) = 270 + 45
17. 672;
   \( (100 + 12)6 = 100(6) + 12(6) \)
   \[ = 600 + 72 \]
19. 488;
   \[ 4(120 + 2) = 4(120) + 4(2) \]
   \[ = 480 + 8 \]
21. Sample answer: 6(2a + 3b – c) 23. 2a + ay + 2b + by
25. No; 3 + (4 • 5) = 23 but (3 + 4) • (3 + 5) = 56

Pages 381–382 Lesson 5-4 Extra Practice

27. 24 29. –8a – 8b 31. –2p – 14 33. n(4.75 + 2.50) + 30; 7.25n + 30 35. –12ab – 30ac 37. 6y + 12z
39. –72p + 48n 41. 3 \times (18.95 + 14.95 + 9.95); $131.55; Sample answer: The ticket prices can be added first and then the sum can be multiplied by 3. This requires fewer steps and easier computations than multiplying each price by 3 and then adding the resulting products.

Page 385 Problem-Solving Investigation Make a Table
Case 3. 26 containers Case 5. 2n + 2; 18 toothpicks

Pages 391–392 Lesson 5-5 Independent Practice
1. terms: 2, 3a, 9a; like terms: 3a, 9a; coefficients: 3, 9; constant: 2
3. terms: 9, –z, 3, –2z; like terms: 9 and 3, –z and –2z; coefficients: –1, –2; constants: 9, 3 5. 11c 7. 1.03t; $.7416
9. 2x + 30 11a. 7 + 5x + 4y + 2x b. $43 13. 16a + 8b + 4 15. Sample answer: 3x + x = 7; coefficients: 3, 1; constant: –7 17. 18x – 3; 18x – 3 = 18(2) – 3 = 33 and 8x – 2x + 12x – 3 = 8(2) – 2(2) + 2(3) = 33

Pages 393–394 Lesson 5-5 Extra Practice
19. terms: 4, 5y, –6y, y; like terms: 5y, –6y, y; coefficients: 5, –6, 1; constant: 4 21. terms: –3d, 8, –d, –2; like terms: –3d and –d, 8 and –2; coefficients: –3, –1; constants: 8, –2 23. 2 + 4d 25. 2m – 2 27. 7m – 20 29. 20x + 9
31. 38g + 36h – 38 33. 5a + 9b 35. t = hours Tricia volunteered; t + 9 37. 10 39. 13

Pages 399–400 Lesson 5-6 Independent Practice
1. 11x + 11 3. 4x – 16 5. 4x + 14 7. (2x + 10) mm; 230 mm 9. –x + 2 11. 8.7x – 1.6 13. Sample answer: (10x + 2) and (–15x + 2) 15. 2x + 1; The expression 2x + 1 will always be odd when x is an integer because when an integer is doubled, the result is always even. Adding one to the result will give an odd number.

Pages 401–402 Lesson 5-6 Extra Practice

Pages 407–408 Lesson 5-7 Independent Practice
1. 5x + 2 3. 2x + 2 5. 8x – 12 7. 5x – 2;
248 customers
9. \( x + 0.51 \) 11. Sample answer: The additive inverse of \((2x + 1)\) is \((-2x – 1)\).
\((5x + 3) – (2x + 1) = (5x + 3) + (–2x – 1) = 5x + 3 + (–2x) + (–1) = 5x + (–2x) + 3 + (–1) = 3x + 2

13. –x + 5 15. Sample answer: The rule is to add the inverse when subtracting integers, and is applied to each term in the linear expression that is subtracted.

Pages 409–410 Lesson 5-7 Extra Practice
17. –3x + 6 19. –16x + 2 21. –4x – 7 23. 0.8x + 0.6 25. –x + 2 27. \( 12 + 1.50t – (10 + 1.25t) = 2 + 0.25t 
29. \( 12x – 4 \) ft; 32 ft 31. \(-\frac{1}{4}\) 33. \(\frac{1}{8}\) 35. \(\frac{2}{3}

Pages 419–420 Lesson 5-8 Independent Practice
1. 24 36k 5. cannot be factored 7. 4 units by \((x – 2)\) units 9. \((x + 2)\) dollars 11. 5\((x + 4)\) units\(^2\) 13. 4\((5x + 19)\) units\(^2\) 15. Sample answer: 20m and 12mn
17. \(6(4x – y)\)

Pages 421–422 Lesson 5-8 Extra Practice
19. 6rs 21. 20x 23. 25xy 25. 6(3x + 1) 27. 5(2x – 7)
29. \(10(3x – 4)\) 31. \((2x + 5)\) in. 33. \(\frac{2}{3}(x + 9)\) 35. \(\frac{5}{6}(x – 36)\)
37. \(\frac{1}{8}(x + 48)\) 39. 16ab, 12a; 28a, 20a 41. 3a + 30

Page 425 Chapter Review Vocabulary Check

Across
3. simplest form 7. sequence 11. counterexample 13. define

Down
1. equivalent 5. variable 9. term

Page 426 Chapter Review Key Concept Check

1. 1 + 3 3. 2x – 4 5. 3(x + 7)
Chapter 6 Equations and Inequalities

Page 432 Chapter 6 Are You Ready?
1. 5.5x = 44  13a. $5.50  13b. 15. Sample answer: Divide each side by 5.5. Then simplify. x = 8  15. True; Sample answer: Multiply each side of the equation by $\frac{3}{5}$ instead of dividing each side by 5.
17. Sample answer: Multiply both sides by x, then divide both sides of the equation by 6; −5.

Pages 441–442 Lesson 6-1 Independent Practice
7. $d + 22 = 176; 154 \text{ ft}$ 9c. The solution of each equation is 197; Colosso is 197 feet tall. 11. $115 + 115 + 65 + x = 360; 65$ 13. She should have subtracted 5 from each side; −13 15. $x + 2 = 8$; The solution for the other equations is −6.

Pages 443–444 Lesson 6-1 Extra Practice
17. −9 19. −12 21. 7

13b. $5.5x = 44$  13c. Sample answer: Divide each side by 5.5. Then simplify. $x = 8$  15. True; Sample answer: Multiply each side of the equation by $\frac{3}{5}$ instead of dividing each side by 5.
17. Sample answer: Multiply both sides by $x$, then divide both sides of the equation by 6; −5.

Pages 453–454 Lesson 6-2 Extra Practice
19. 4 21. 70 23. −120 25. 50 = 25t; 2 s 27. 8 in.
29. $\frac{11}{3}$ 31. $\frac{3}{4}$ 33. $\frac{13}{4}$ 35. 4 37. 2.1 39. $\frac{21}{4}$ or $\frac{51}{4}$

Pages 461–462 Lesson 6-3 Independent Practice
1. 5 3 5. $\frac{20}{3}$ or $\frac{6}{2}$ 7. $3 \frac{3}{4} = 46.50; \$62$ 9. Emily’s homeroom class; Sample answer: Write and solve the equations $0.75e = 15$ and $\frac{2}{3}s = 12$; $e = 20$ and $s = 18$; Since 20 > 18, Emily’s homeroom class has more students. 11. 20; Sample answer: Solve $8 = \frac{m}{4}$ to find that $m = 32$. So, replace $m$ with 32 to find $32 - 12 = 20$. 13. Sample answer: Multiply each side by 2. Then divide each side by $(b_1 + b_2)$, So, $\frac{2a}{b_1 + b_2} = h$.

Pages 463–464 Lesson 6-3 Extra Practice
15. 7 17. −3.8 19. $-1\frac{25}{12}$ or $-10 \frac{5}{12}$ 21. $\frac{16}{15}$ of elevation, 140 ft

23. a train that travels 100 miles in $\frac{2}{3}$ hour; a train that travels 90 miles in $\frac{3}{5}$ hour 25. 22 27. 2 29. $3 \times 0.25 + 5 \times 0.50; \$3.25$

Pages 473–474 Lesson 6-4 Independent Practice
1. 3 5. −3

7. $\text{savings to date, } \$189$

189 = 10x + 99; 9 weeks 9. 2.25 11a. −9°C 11b. 92.2°F 13. No, none of the Fahrenheit temperatures convert to the same temperature in Celsius. Only −40°F = −40°C. 15. Sample answer: Cameron found the area of the trapezoid to be 52 square inches. One base was 12 inches long and the other was 14 inches long. What is the height $h$ of the trapezoid?; 4 in.
23b. $48 = 32 + 2w; 8 \text{ cm}$  
23c. Sample answer: Using either method, you would subtract first and then divide

**Pages 485–486 Lesson 6-5 Independent Practice**

1. 6  5  3  -14  5. 3 -3.2  7. 3(5 + 5) = 60; 15 in.
9a. 12(m - 2.57) = 0.36  9b. Sample answer: I first divided each side by 12 and then added 2.57 to each side; $2.60.
11. Sample answer: Marisol should have divided by six before subtracting three; $6(x + 3) = 21, x + 3 = 3.5, x = 3.5 - 3, x = 0.5$
13. $3(x - 8) = 12$; Sample answer: Valeria bought a new collar for each of her three dogs. She paid $8 for each necklace. Suppose she had $12 left. How much money did Valeria have initially to spend on each dog collar? $12 per collar

**Pages 487–488 Lesson 6-5 Extra Practice**

15. 16  17. -2  19. 78  21. $\frac{3}{4}$ or 5.75

23. $1.20(n + 2\frac{1}{2}) = 4.50; 1.25 or 1\frac{1}{2}$ pounds  25. Divide both sides by $p$; Add $q$ to both sides.

27. -4  29. 4  31. -3

**Pages 491 Problem-Solving Investigation Work Backward**

Case 3. 1,250 ft  Case 5. 6:25 A.M.

**Pages 501–502 Lesson 6-6 Independent Practice**

1. $h \leq -8$  3. $5 < n$  5. $x > -1$
7. $m \geq -6$

9. $n + 4 \geq 13; n > 9$
11. $p + 17 \leq 26; p \leq 9$; Nine additional players or fewer can make the team.

13a. $42 + x \geq 74; x \geq 32$  13b. $74 + y \geq 110; y \geq 36$
15. Sample answer: $x + 3 < 25$  17. No; Sample answer: The solution is $x \geq -1$, so the graph should have a closed dot above -1 and the arrow should point to the right, not the left.

**Pages 503–504 Lesson 6-6 Extra Practice**

19. $m \leq 4.3$
21. $-5 < a$

23. $n - 8 \leq 10; n < 18$  25. $68 + c \leq 125; c \leq 57$; The salesman has 57 cars or less left to sell.

27. $\frac{2}{3} > x$ or $x < \frac{2}{3}$
29. $m \geq 11\frac{1}{5}$
31. $n \geq -4\frac{3}{16}$

33. $x + 4 \leq 7; -7 \geq x - 10$  35. -4; See answer 39 for graph.

37. -2; See answer 39 for graph.  39. -6;

**Pages 511–512 Lesson 6-7 Extra Practice**

23. $y > -5$  25. $p \geq -6$  27. $-40 < y$ or $y > -40$
29. $w > 13$

31. $-20 \leq t$ or $t \leq -20$

33. $4n \geq -12; n \geq -3$  35a. False  35b. True  35c. False

37. 2  39. -2.5  41. 12
3. Sample answer: At the electronics store, CDs were marked down $2.80 from their regular price. Orlando has $45 to spend on 4 CDs. How much can he spend on each CD? $14.05

8. Sales for her pay to be $125.

15. True; Sample answer:

17. Sample answer: Each pair of angles is adjacent and forms a straight angle. So \(2(2x + 8) + (5x - 10) = 180\) and \(3(3x + 42) + (x + 34) = 180\). When you solve both equations, \(x = 26\). The angle measures are 60°, 120°, 120°, and 60°.

21. Sample answer: \(\angle 1\) and \(\angle 3\); Since \(\angle 1\) and \(\angle 3\) are opposite angles formed by the intersection of two lines, they are vertical angles.

23. 925a. vertical 25b. adjacent 25c. adjacent 25d. vertical 27. 134° 29. 38° rectangle

Page 524 Chapter Review Key Concept Check
1. solution 3. equivalent equations

Chapter 7 Geometric Figures

Page 534 Chapter 7 Are You Ready?
1. 40° 3. 90° 5. 6.72 yd²

23b. The lines appear to be perpendicular. 23c. line a: 1; line b: –1 25. x°; 90°; 180°; 45°; 45°
27. y

Pages 559–560 Lesson 7-3

1. acute equilateral; Sample answer:

3. acute equilateral

5. obtuse isosceles

7. 118

9. acute isosceles

11. 125 + a = 180, so a = 55; a + b + 60 = 180, so b = 65; 60 + d = 90, so d = 30; c + d = 90 = 180, so c = 60

13a. never; Sample answer: The sum of the interior angles of a triangle is 180°. Two right angles have a sum of 180°. This means the third angle would equal 0°, which is impossible.

13b. never; Sample answer: The sum of the interior angles of a triangle is 180°. The measure of an obtuse angle is greater than 90°. So, a triangle cannot have more than one obtuse angle.

Pages 561–562 Lesson 7-3

15. acute isosceles

17. right scalene

19. obtuse isosceles;

Sample answer:

21. 90

23. 33°

25. 30

27a. False

27b. True

27c. False

9. triangle; It is the only two-dimensional figure.

11a. never

11b. never

11c. sometimes

Pages 569 Problem-Solving Investigation

Make a Model

Case 3. 15 tables; 2 people can sit on the ends. Then divide the remaining people by 2. (32 − 2) ÷ 2 = 15. Case 5. Faith: Spanish; Sarah: German; Guadalupe: French

Pages 579–580 Lesson 7-4

1. 102.6 mi

2. 12 cm; \( \frac{1}{3} \)

3. 108 ft²

9. always;

Sample answer: A scale factor of \( \frac{1}{3} \) means that 3 units of the drawing is equal to 1 unit of the object, so the scale drawing or model will be larger than the actual object.

Pages 581–582 Lesson 7-4

11. 30 km

13. 102.5 km

15. 109 \( \frac{3}{8} \) ft

17. 3,420 ft²

19. 40 ft by 60 ft; Sample answer: Set up and solve proportions to find the actual length and width: \( \frac{1}{20} \) in. = \( \frac{1}{w} \) in. and \( \frac{1}{20} \) ft = \( \frac{3}{\ell} \) ft

21. 10

23. 22

Copyright © McGraw-Hill Education
Circumference will be a little more than 3 times 8, or 24 feet.

Page 617–618 Lesson 8-1 Independent Practice
1. The circumference would double. For example, with a diameter of 4 feet, the circumference is about 12.6 feet. With a diameter of 8 feet, the circumference is about 25.1 feet.

Pages 619–620 Lesson 8-1 Extra Practice
19. 3.5 in.  21. 72 ft  23. \( \frac{22}{7} \times 21 = 66 \) ft  25. \( \frac{22}{7} \times 42 = 132 \) mm  27. 37.7 cm  29. Each is \( \pi \), or about 3.14, units longer than the previous circle. 31a. False  31b. True  31c. False

Pages 627–628 Lesson 8-2 Independent Practice
1. 3.14 \times 6 \times 6 = 113.0 cm²  3. 3.14 \times 5.5 \times 5.5 = 95.0 ft²  5. 3.14 \times 6.3 \times 6.3 = 124.6 mm²  7. 254.3 ft²
9. 226.1 in²  11. 163.3 yd²  13. The large pizza; the medium pizza’s area is 78.5 square inches and costs $0.102 per square inch. The large pizza’s area is 153.86 square inches and costs $0.097 per square inch. 15. When the radius of a circle is doubled, the circumference doubles and the area is 4 times as large. In the formula for area of a circle, the radius is squared, so when the radius of a circle is doubled, the area is \( 2^2 \) or 4 times as large. 17. 5.9 in²  19. Sample answer: To find the area of the quarter circle, multiply the area of the entire circle by 14; \( A = \frac{1}{4} \pi r^2 \); 19.6 in²

Pages 629–630 Lesson 8-2 Extra Practice
21. 3.14 \times 6.3 \times 6.3 = 124.6 cm²  23. 3.14 \times 5.4 \times 5.4 = 91.6 yd²  25. 3.14 \times 9.3 \times 9.3 = 271.6 mm²  27. 144.7 ft²
29. 64.3 in²  31. circle; \( \frac{1}{2} \times 100 \times 100 < 3 \times 50 \times 50 
33. 154 in²; Sample answer: Using \( \frac{22}{7} \) makes the computation easier since the radius is 7. The 7s cancel out in the multiplication. 35. 210 in²  37. 39.5 cm²

Pages 635–636 Lesson 8-3 Independent Practice
1. 64 cm²  3. 220.5 cm²  5. 38.6 ft²  7. 119.5 ft²
9. 77 cm²  11. 44.6 ft²; 30.3 ft  13. 110.8 ft²

Pages 637–638 Lesson 8-3 Extra Practice
15. 87.5 m²  17. 180 cm²  19. 9 cm²  21. 240 ft²
23a. 36  23b. 14.14  23c. 92.56  25. 3.7 cm²  27. 4.7 m

Pages 643–644 Lesson 8-4 Independent Practice
1. 192 m³  3. 108 m³  5a. 96 ft³; 128 ft³; 168 ft³; 160 ft³; 120 ft³  5b. The height must allow the water to be deep enough for someone to get wet and the length and width must allow a person to fit. So the first and last sets of dimensions would not work. 7a. Sample answer: There is a direct relationship between the volume and the length. Since the length is doubled, the volume is also doubled. 7b. The volume is eight times greater. 7c. Neither; Sample answer: doubling the height will result in a volume of \( 4 \times 4 \times 10 \) or 160 in³; doubling the width will result in a volume of \( 4 \times 8 \times 5 \) or 160 in³.
Selected Answers

Page 645–646 Lesson 8-4 Extra Practice
11. 236.3 cm³  13. 20.4 mm³  15. 306.52 = 19.4h; 15.8 m
17. 166 1/4 yd³  19. 2 in. by 1.5 in. by 0.5 in.; 3 in. by 1 in. by 0.5 in.  21. 25.8 m  23. 29.2 cm

Page 649 Problem-Solving Investigation Solve a Simpler Problem
Case 3. 80 chairs  Case 5. 7,763,270.6 mi²; Sample answer: The area of Asia is about 17,251,712.4 mi² and the area of North America is about 9,488,441.8 mi². 17,251,712.4 - 9,488,441.8 = 7,763,270.6

Page 657–658 Lesson 8-5 Independent Practice
1. 80 ft³  3. 42 ft³  5. 14 in.  7. 10 in³  9. The volume is eight times greater; Sample answer: Since each dimension is two times greater, the volume is 2 x 2 x 2 or eight times greater. 11. Sample answer: first set: area of the base, 40 ft²; height of the pyramid, 12 ft; second set: area of the base, 30 ft²; height of the pyramid, 16 ft  13. The volumes are the same.

Page 659–660 Lesson 8-5 Extra Practice
15. 60 in³  17. 195 yd³  19. 11 ft  21. 22 in.
23. 1,234.2 m³  25. 24 in.; Sample answer: Replace V with 1,560 and B with 13 x 15 in the formula V = 1/3 Bh. Then solve for h.

Page 669–670 Lesson 8-6 Independent Practice
13. 833.1 mm²  15. 96 ft²  17. Yes; there are 2,520 ft² of fencing. Since 8 gallons of paint will cover 350 x 8 or 2,800 ft² and 2,800 ft² > 2,520 ft², 8 gallons is enough paint.
19. 64.5 in²  21a. 12.5  21b. 50  21c. 70  21d. 195
23. triangle; triangle; triangle  25. rectangle; circle; oval

Page 671–672 Lesson 8-6 Extra Practice
9. 6.5 cm
11. Sample answer: Both a square pyramid and a rectangular pyramid have isosceles triangles as their lateral faces. All the lateral faces are congruent on a square pyramid but, on a rectangular pyramid, the opposite pairs of lateral faces are congruent.

Page 683–684 Lesson 8-7 Extra Practice
13. 197.1 m²  15. 765 cm²  17. 26.1 ft²
19. Area of the base  Slant height

Page 699 Chapter Review Vocabulary Check
1. diameter  3. circle  5. circumference  7. semicircle
9. volume  11. lateral

Page 700 Chapter Review Key Concept Check
1. twice  3. height
Chapter 9 Probability

Page 710  Chapter 9  Are You Ready?

1. \(\frac{1}{3}\)  3. \(\frac{2}{3}\)  5. 30  7. 24

Pages 715–716 Lesson 9-1 Independent Practice

1. \(\frac{1}{4}\), 25%, or 0.25  3. \(\frac{1}{1}\), 100%, or 1  5. \(\frac{1}{5}\), 0.2, or 20%; Sample answer: Since 80% arrive on time, that means that 20% do not arrive on time.  7. Picking a black jelly bean is impossible since the probability of picking a black jelly bean is 0%.

9a. \(\frac{1}{8}\), 0.125, 12.5%  9b. \(\frac{3}{4}\), 0.75, 75%

11. 70%, \(\frac{1}{3}\); Sample answer: 70% and \(\frac{1}{3}\) are probabilities that are not complementary because \(0.7 + 0.3 \neq 1\). The other sets of probability are complementary.

Pages 717–718 Lesson 9-1 Extra Practice

13. \(\frac{1}{5}\), 20%, or 0.2  15. \(\frac{7}{10}\), 70%, or 0.7  17. \(\frac{1}{2}\), 50%, or 0.5

19. \(\frac{3}{5}\), 60%, or 0.6  21. The complement of selecting a girl is selecting a boy. The probability of the complement is \(\frac{3}{25}\), or 0.12. So, 25% misses more foul shots than Dwayne.

Pages 725–726 Lesson 9-2 Independent Practice

1. \(\frac{1}{5}\); The experimental probability is close to the theoretical probability of \(\frac{1}{6}\).  2. \(\frac{9}{10}\); The experimental probability is close to the theoretical probability of \(\frac{5}{6}\).

3a. 162 people  3b. about 134 people  5a. \(\frac{1}{3}\)

b. \(\frac{6}{25}\), \(\frac{13}{50}\)

c. Sample answer: Section B should be one half of the spinner and sections A and C should each be one fourth of the spinner.

7. Yes; Sample answer: \(\frac{5}{10}\) sharpened \(\frac{20}{x}\) unsharpened. So, \(x = 40\).

Pages 727–728 Lesson 9-2 Extra Practice

9. \(\frac{9}{20}\); The experimental probability of \(\frac{9}{20}\) is close to the theoretical probability of \(\frac{1}{2}\).  11. 50 customers

13. experimental; 40; less  15. P(not red)  17. vanilla sundae, vanilla cone, chocolate sundae, chocolate cone, strawberry sundae, strawberry cone; equally likely
Sample answer: Spin a spinner with 4 equal-size sections 50 times. 3. Sample answer: Spin a spinner divided into 3 equal sections and roll a number cube. Repeat the simulation until all types of cookies are obtained. 5. Sample answer: Use 3 red marbles to represent winning and 7 blue marbles to represent losing. Draw 1 marble 4 times, replacing the marble each time. 7. Sample answer: a survey of 100 people voting on whether or not to enact a tax increase, where each person is equally likely to vote yes or no. Toss a coin 100 times. 9. Sample answer: sometimes; The spinner must have equal-sized sections.

11. Sample answer: Use a spinner with 5 equal sections to represent winning and 7 blue marbles to represent not winning a prize; Roll a number cube. Let rolling a 1 represent winning a prize and let rolling a 2, 3, 4, 5, or 6 represent not winning a prize; Roll a number cube. Let spinning A represent winning a prize and let spinning other letters represent winning a prize; Roll a number cube. Let rolling a 1 represent winning a prize and let rolling a 2, 3, 4, 5, or 6 represent not winning a prize.

Case 3. 31 Case 5. unfair; Sample answer: There are 20 out of 36 outcomes that are multiples of 3 and only 15 that are multiples of 4. Jason has a greater chance of winning.

12. 3.84 5. 6 possible routes; 1 of 6 or about 17% 7. about 1/50; very unlikely 9. No; the number of selections is 32 · 11 or 352, which is less than 365. 11. 10 groups, 8 activities have 80 outcomes; the other two have 72 outcomes. 13. 6

15. 8 17. 27 19. 16 21. 4/48 or 1/12. Sample answer: There are 3 · 4 · 4 or 48 different possible outcomes of a phone plan. There are 1 · 4 · 1 or 4 different possible outcomes of a phone plan that includes Brand B and has a headset. 23. 108 = 9 x c x 2; 6 colors 25. 1/3 27. Sample answer: Assign each number of a number cube to a toy. Roll the number cube. Repeat until all numbers are rolled.

11. Sample answer: The number of ways you can order 3 books on a shelf is 3 · 2 · 1 or 6. 13a. 15 13b. 120 13c. 10 13d. 28
Selected Answers

Pages 805–806 Lesson 10-2 Independent Practice
1. The conclusion is valid. This is an unbiased systematic random sample.
3. This is a simple random sample. So, the sample is valid; about 205 people.
5. Sample answer: Questions should be asked in a neutral manner. For example, the question “You really don’t like Brand X, do you?” might not get the same answer as the question “Do you prefer Brand X or Brand Y?”
7. Sometimes; Sample answer: The sample needs to represent the entire population to be valid.
9. Sample answer: The sample will be biased because it is a convenience sample. Marisol will be asking only basketball fans.

Pages 807–808 Lesson 10-2 Extra Practice
11. This is an unbiased, simple random sample because randomly selected Californians were surveyed. So, the conclusion is valid.
13. This is an unbiased, simple random sample. So, the conclusion is valid; 304 students.
15. The survey results in a convenience sample; Sample answer: The school district should survey every tenth family living within the school district’s boundaries.
17a. Invalid
17b. Valid
17c. Valid
19. median; Sample answer: She scored better than the mean on four of the tests. She scored lower than the mode on four of the tests.

Pages 817–818 Lesson 10-3 Independent Practice
1. Graph B; Sample answer: The ratio of the area of the gas pumps in the graph on the right are not proportional to the cost of gas.
3. The median or the mode because they are much closer in value to most of the data.
5.

Pages 819–820 Lesson 10-3 Extra Practice
11. Sample answer: The scale of the graph is not divided into equal intervals, so differences in heights appear less than they actually are.
13. Sample answer: The mode is 100, but she only received 100 two times out of 6 tests.
15. The intervals on the vertical scale are inconsistent.

Page 823 Problem-Solving Investigation Use a Graph
Case 3. Sample answer: 2017

Pages 833–834 Lesson 10-4 Independent Practice
1. Sample answer: The times at Lucy’s Steakhouse have a median of 20 minutes with an interquartile range of 20 minutes. The times at Gary’s Grill have a median of 15 minutes with an interquartile range of 10 minutes. In general, a customer will wait longer at Lucy’s Steakhouse.
3a. Plant A: 2.75, 0.75; Plant B: 3.1, 0.7
3b.
3c. Sample answer: Both populations have similar interquartile ranges. The median for Plant B is greater. So, Plant B generally showed more growth.
5. The data shown in the histograms are only shown in intervals. Specific values are not shown.

Pages 835–836 Lesson 10-4 Extra Practice
9. this season; Sample answer: Both seasons’ scores have a median of 20 points, but last season’s scores have an interquartile range of 15 points while this season’s interquartile range is 10 points. So, the football team’s performance was more consistent this season.
11. Sample answer: 2, 4, 4, 5, 8, 9, 10
13a. False
13b. False
13c. True
15. 1.74 million
17. Sample answer: The shape of the distribution is not symmetric since the lengths of each box and whisker are not the same. There are no outliers.
3. A box plot is an appropriate graph because there is a large set of data and it will show the measures of variation of the data set. This graph has a median of 41.

**Number of Push-ups**

35 36 37 38 39 40 41 42 43 44 45 46 47 49 48 50

5a. Situation B; Sample answer: A bar graph can show the number of customers who made a purchase by each individual age.  
5b. Yes; Sample answer: line plot; A line plot shows the frequency of data on a number line.  
7. always; Sample answer: The sections of the circle graph can be taken from the bars of the graph and the percents can be found by dividing each bar’s value by the total number of data values.  
9. Sample answer: Both use bars to show how many things are in each category. A histogram shows the frequency of data that has been organized into equal intervals, so there is no space between the bars. It would be appropriate to use a histogram instead of a bar graph when the data can be organized into equal intervals.

11. circle graph; compares parts to a whole

13a. **Volume of the Great Lakes**

<table>
<thead>
<tr>
<th>Great Lakes</th>
<th>Erie</th>
<th>Huron</th>
<th>Ontario</th>
<th>Michigan</th>
<th>Superior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Total Volume</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

13b. Sample answer: The circle graph is most appropriate because it shows how each lake compares to the whole.

15. A histogram is an appropriate graph because the data is given in intervals. The graph shows people ages 26–30 text the least amount.

17. line graph; circle graph; bar graph

19. 65 men; 65 women

---

**Across**

5. population  
9. sample

**Down**

1. systematic  
3. simple  
7. unbiased

---

Page 849  Chapter Review  Vocabulary Check

Page 850  Chapter Review  Key Concept Check

1. survey  
3. biased sample