Lesson 1 Skills Practice

A Plan for Problem Solving

Use the four-step plan to solve each problem.

1. Jackie wants to take out an ad in the newspaper for her upcoming garage sale. She can buy a 4-line ad for $4.35 that will run for three days. If she wants to spend no more than $15 on advertising, how long can she advertise?

2. Cy Young pitched in 815 games over 22 years. He won 511 games. About how many games did he win per year?

3. Find the next term in the pattern 63, 54, 45, 36, 27, ...

4. Each month, Kevin’s car costs $59 for insurance, $42 for maintenance, and $58 for gas. About how much does it cost Kevin to drive his car for a year?

5. How many ways can you make change for a dollar using nickels, dimes, and/or quarters?

6. Friday night Joe decided to order a 1-topping pizza. He had a choice of thin or thick crust and a choice of five toppings (pepperoni, mushrooms, sausage, onions, or peppers). How many different pizzas could he choose from?

7. Julie wants to buy a guitar that costs $164. The guitar is on sale for 10% off. Additionally, Julie has a gift certificate for $25. How much will Julie pay for the guitar (before tax)?

8. The number of seats in the first 5 rows of the Majestic Theatre is as follows: 10, 14, 18, 22, and 26. Assuming the pattern continues, how many seats are in the next row?

9. Aisha’s first summer job requires her to travel downtown. She is interested in finding out how most people get to work each day, so she finds the results of an online survey. According to the survey below, what percent of the workers walk to work?

<table>
<thead>
<tr>
<th>Workers Ages 16 and Over</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>drive alone</td>
<td>7,862,418</td>
</tr>
<tr>
<td>carpool</td>
<td>1,120,982</td>
</tr>
<tr>
<td>take public transit</td>
<td>144,959</td>
</tr>
<tr>
<td>walk</td>
<td>138,496</td>
</tr>
<tr>
<td>other means</td>
<td>149,641</td>
</tr>
<tr>
<td>work at home</td>
<td>346,626</td>
</tr>
</tbody>
</table>

10. Roger likes to eat Crunchy Flakes cereal for breakfast every morning. Crunchy Flakes comes in a 20-ounce box that costs $4.20 and a 30-ounce box that costs $6.00. Explain which box of cereal is the better buy.
Lesson 2 Skills Practice

Words and Expressions

Write a numerical expression for each verbal phrase.

1. the difference of seventeen and three
2. eleven more than six
3. the sum of eight, twenty, and thirty-five
4. the quotient of eighty and eight
5. one hundred decreased by twenty-five
6. three more than one dozen
7. the product of twenty and thirty
8. five less than fifty

Evaluate each expression.

9. $2 - 3 \cdot 0$
10. $25 \div 5 - 4$
11. $5 + 2 - 3$
12. $2 \cdot 5 + 6$
13. $9 \div 3 \cdot 2 + 1$
14. $5 + 2 \cdot 8 + 2 - 5$
15. $4 + 2 \cdot 8$
16. $30 - 12 \cdot 2$
17. $5 + 2 \cdot 3 + 4$
18. $10 - 2 \cdot 4 - 1$
19. $15 - 10 \div 2$
20. $25 - 6 \cdot 4 + 9$
21. $(14 + 6) \div 5$
22. $100 + 50 \div 10$
23. $14 - (4 \cdot 2)$
24. $(3 + 4) \cdot (5 + 3)$
25. $6(4 + 5)$
26. $\frac{(8 \cdot 9)}{(3 \cdot 4)}$
27. $(2 + 3) \cdot 5 + 1$
28. $24 - 24 \div 8$
29. $56 \div (3 + 4)$
30. $2[(4 + 5) \cdot 3]$
Lesson 3 Skills Practice

Variables and Expressions

Translate each phrase into an algebraic expression.

1. two inches shorter than Kathryn's height
2. the quotient of some number and thirteen
3. some number added to seventeen
4. six centimeters shorter than the length of the pencil
5. three pounds lighter than Adlai's weight
6. the difference of some number and eighteen
7. three dollars more than the cost of a ticket
8. eight more than the product of a number and four
9. half as many pieces of candy
10. twice as long as the length of the string

Evaluate each expression if \( x = 4, \ y = 6, \) and \( z = 3. \)

11. \( x + y + z \)
12. \( 3x + y \)
13. \( x - z \)
14. \( x + y - 3z \)
15. \( 15z \)
16. \( 3(x + z) \)
17. \( xz \div y \)
18. \( yz - x \)
19. \( \frac{xy}{z} \)

Evaluate each expression if \( a = 7, \ b = 9, \ c = 2, \) and \( d = 5. \)

20. \( a + b + c \)
21. \( a + b - (c + d) \)
22. \( 3a + 4d \)
23. \( bcd \)
24. \( (a + b) \cdot (c + d) \)
25. \( c(4 + d) \)
26. \( \frac{b}{a + c} \)
27. \( a + b - 3c \)
28. \( ab - cd \)
29. \( \frac{bc}{a - d} \)
Lesson 4 Skills Practice

Properties of Numbers

Name the property shown by each statement.

1. $9 \cdot 7 = 7 \cdot 9$

2. $37 \cdot 0 = 0$

3. $1 \cdot 87 = 87$

4. $14 + 6 = 6 + 14$

5. $3(6a) = (3 \cdot 6)a$

6. $2b + 0 = 2b$

7. $4 + (6 + 8) = (4 + 6) + 8$

8. $2 \cdot (15 \cdot 10) = 2 \cdot (10 \cdot 15)$

Simplify each expression.

9. $(a \cdot 0) \cdot 6$

10. $b + (7 + 5)$

11. $4w(9)$

12. $20(t \cdot 1)$

13. $(x + 5) + 4$

14. $(6a)10$

15. $38 + (v + 12)$

16. $8(3q)$

17. $16p \cdot 0$

18. $16 + (22 + c)$

19. $8(9p)$

20. $(17 + 33) + x$

21. $3(11k)$

22. $16 + (y + 9)$

23. $m(13 \cdot 5)$

24. $17 + (n + 0)$

Math Accelerated • Chapter 1 The Language of Algebra
Lesson 5 Skills Practice

Problem-Solving Strategies

Use a strategy to solve each problem.

1. When four is added to a number, and then their sum is divided by 3, the result is 2. What is the number?

2. The length of each side of the squares below is 2 ft. Find the perimeters of the next two figures in the pattern.

   \[
   \begin{array}{ccc}
   & & \\
   & \square & \\
   \square & & \\
   \end{array}
   \]

3. The list shows the ages of 25 adults selected at random from the audience of a jazz band concert in the park. How many people that attended the concert are between the ages of 58 years and 67 years?

   \[
   \begin{array}{ccccccc}
   30 & 45 & 18 & 75 & 56 \\
   59 & 61 & 64 & 36 & 72 \\
   54 & 19 & 55 & 60 & 62 \\
   63 & 68 & 32 & 45 & 40 \\
   77 & 62 & 66 & 50 & 73 \\
   \end{array}
   \]

4. There was a total of $548 collected for tickets to the school play. The adult tickets cost $6, and the student tickets cost $4. If 12 more student tickets were sold than adult tickets, find the numbers of adult and student tickets sold.

5. In the sequence below, which expression can be used to find the value of the term in the \( n \)th position?

   \[
   \begin{array}{cccccc}
   \text{Position} & 1 & 2 & 3 & 4 & 5 & n \\
   \text{Value of Term} & 8 & 9 & 10 & 11 & 12 & ? \\
   \end{array}
   \]

6. Amy is catching a flight for London at 12:00 noon. Prior to leaving for the airport, she needs to allow 30 minutes for a shower and 30 minutes to finish packing last minute items. She also needs to give herself 1 hour to drive to the airport. If she needs to arrive for her international flight two hours before departure, then she needs to set her alarm to wake up by what time in order to be on schedule?
Lesson 6 Skills Practice

Ordered Pairs and Relations

Graph each ordered pair on the coordinate plane.

1. A(2, 5)
2. M(6, 4)
3. Z(1, 1)
4. R(3, 0)
5. Q(7, 8)
6. W(0, 6)

Write the ordered pair that names each point.

7. N
8. K
9. A
10. V
11. Z
12. G
13. R
14. B

Express each relation as a table and as a graph. Then determine the domain and range.

15. \{(3, 7), (1, 1), (6, 5), (2, 4)\}

16. \{(0, 3), (5, 7), (1, 8)\}

17. \{(2, 3), (3, 2), (1, 7), (7, 1)\}

18. \{(5, 6), (0, 2), (4, 4) (8, 3)\}
Lesson 7 Skills Practice

Words, Equations, Tables, and Graphs

Copy and complete each table. Then state the domain and range of the relation.

1. A phone call costs $3 a minute.

<table>
<thead>
<tr>
<th>m</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

2. Jared has 4 less than 3 times the number of trophies that Zach has.

<table>
<thead>
<tr>
<th>z</th>
<th>j</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

3. The cost for a class trip is $5 per student plus $100 for the bus.

<table>
<thead>
<tr>
<th>s</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

4. A child’s admission is $4 more than half an adult’s admission.

<table>
<thead>
<tr>
<th>a</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td></td>
</tr>
</tbody>
</table>

5. There are 12 inches in 1 foot.
   a. Write an equation to find the number of inches in any number of feet.
   b. Make a table to find the number of inches in 4, 6, 8, and 10 feet.
   c. Graph the ordered pairs for the relation.
Lesson 1 Skills Practice

Integers and Absolute Value

Write an integer for each situation. Identify its opposite and describe its meaning. Then graph the integer and its opposite on a number line.

1. a bank deposit of $200
2. a loss of 10 yards
3. 450 feet above sea level
4. 7°F below normal

Replace each • with <, >, or = to make a true sentence.

5. 1 • 0
6. −3 • 0
7. 0 • −1
8. 0 • 9
9. −7 • −7
10. 2 • −2
11. −2 • 8
12. −4 • 4
13. 5 • 5
14. 0 • −6
15. 4 • 10
16. 6 • −6
17. 3 • 7
18. −1 • −2
19. 3 • 4
20. −3 • −4

Evaluate each expression.

21. |1|
22. |−10|
23. |−8|
24. |10|
25. |4| + |−4|
26. |9| − |−5|
27. 0 + |−1|
28. |−6| + |−5|
29. |−8| − |−8|
30. |12| + |−3|
31. |−15| − |6|
32. |−13| + |−7|

Evaluate each expression if \( a = −3 \), \( b = 0 \), and \( c = 1 \).

33. \(|a| − b|
34. \(|c| + 2|
35. 9 − |a|
36. 25 − |b|
37. 10 − |b|
38. |−8| + |a|
Lesson 2 Skills Practice

Adding Integers

Find each sum.

1. \(-7 + (-5)\)  
2. \(10 + 9\)  
3. \(-12 + (-5)\)  
4. \(-13 + (-3)\)  

5. \(-10 + 12\)  
6. \(-7 + 8\)  
7. \(-11 + (-6)\)  
8. \(0 + (-21)\)  

9. \(72 + (-10)\)  
10. \(72 + 10\)  
11. \(-13 + (-11)\)  
12. \(-52 + 52\)  

13. \(-6 + (-12)\)  
14. \(14 + (-8)\)  
15. \(-17 + (-2)\)  
16. \(50 + (-8)\)  

17. \(-22 + 4\)  
18. \(14 + 8\)  
19. \(-21 + (-9)\)  
20. \(15 + (-5)\)  

21. \(9 + 10\)  
22. \(-12 + (-15)\)  
23. \(-13 + 6\)  
24. \(-1 + (-18)\)  

25. \(0 + 31\)  
26. \(-45 + (-15)\)  
27. \(-6 + 20\)  
28. \(24 + (-11)\)  

29. \(7 + (-14)\)  
30. \(-34 + (-10)\)  
31. \(-8 + (-25)\)  
32. \(-31 + 25\)  

33. \(4 + 5 + (-4)\)  
34. \(-4 + (-5) + 6\)  
35. \(-3 + 8 + (-9)\)  

36. \(-6 + (-2) + (-1)\)  
37. \(10 + (-5) + 6\)  
38. \(-8 + 8 + (-10)\)  

39. \(0 + (-8) + 22\)  
40. \(-31 + 19 + (-19)\)  
41. \(32 + (-4) + (-9)\)

Math Accelerated • Chapter 2 Operations with Integers
Lesson 3 Skills Practice

Subtracting Integers

Find each difference.

1. \(-2 - (-8)\)  
2. \(4 - (-11)\)  
3. \(-7 - 6\)  
4. \(15 - 2\)

5. \(-7 - (-1)\)  
6. \(1 - 9\)  
7. \(-5 - (-3)\)  
8. \(6 - (-5)\)

9. \(-4 - (-10)\)  
10. \(4 - 6\)  
11. \(0 - (-15)\)  
12. \(-16 - (-10)\)

13. \(0 - 16\)  
14. \(11 - (-9)\)  
15. \(-9 - 1\)  
16. \(-1 - (-8)\)

17. \(1 - (-2)\)  
18. \(-2 - (-19)\)  
19. \(13 - 17\)  
20. \(20 - (-15)\)

21. \(-10 - (-21)\)  
22. \(4 - 22\)  
23. \(-8 - 16\)  
24. \(12 - (-9)\)

Find the distance between the integers on a number line.

25. 8 and \(-9\)  
26. \(-10\) and 0  
27. \(-6\) and 6

28. \(-5\) and 13  
29. 22 and 2  
30. 8 and \(-21\)

31. 0 and 13  
32. \(-4\) and \(-7\)  
33. \(-6\) and \(-22\)

34. \(-7\) and \(-22\)  
35. \(-33\) and \(-39\)  
36. \(-12\) and 32
Lesson 4 Skills Practice

Multiplying Integers

Find each product.

1. \(-2(8)\)  
2. \(-4(-4)\)  
3. \(6(-2)\)  
4. \(-7(-3)\)  
5. \(12(1)\)  
6. \(0(-2)\)  
7. \(-11(5)\)  
8. \(-9(-3)\)  
9. \(-13(0)\)  
10. \(-1(-7)\)  
11. \(-1(1)\)  
12. \(1(-16)\)  
13. \(-5(20)\)  
14. \(16(-2)\)  
15. \(18(-3)\)  
16. \(-5(-5)\)  
17. \(8(6)(-2)\)  
18. \(-1(50)(-1)\)  
19. \(6(0)(-2)\)  
20. \((-3)(-2)(-1)\)

21. \(-4(5)(-3)\)  
22. \(10(-3)(2)\)  
23. \(-9(8)(1)\)  
24. \(-1(-1)(-1)\)

Simplify each expression.

25. \(-2 \cdot 3x\)  
26. \(-4 \cdot 5y\)  
27. \(9 \cdot (-2z)\)  
28. \(-5 \cdot (-6a)\)  
29. \(8t \cdot (-3)\)  
30. \(2n \cdot (-1)\)  
31. \(-5 \cdot 2w\)  
32. \(8c \cdot (-2)\)  
33. \(-3c \cdot (-5d)\)  
34. \(4r \cdot 7s\)  
35. \(-3x \cdot (-z)\)  
36. \(-4ab \cdot (-6)\)  
37. \((-3)(4)(-x)\)  
38. \(-3(5)(-y)\)  
39. \((-6)(-2)(8r)\)  
40. \(-5(0)(-xy)\)

Evaluate each expression if \(x = -5\) and \(y = -6\).

41. \(3y\)  
42. \(-8x\)  
43. \(-4y\)  
44. \(12x\)  
45. \(xy\)  
46. \(-xy\)  
47. \(-6xy\)  
48. \(4xy\)
Lesson 5 Skills Practice

Dividing Integers

Find each quotient.

1. \(16 \div 4\)  
2. \(-27 \div 3\)  
3. \(25 \div (-5)\)  
4. \(63 \div (-9)\)

5. \(-15 \div (-3)\)  
6. \(14 \div (-7)\)  
7. \(-124 \div 4\)  
8. \(60 \div 15\)

9. \(28 \div (-4)\)  
10. \(-56 \div (-8)\)  
11. \(72 \div 8\)  
12. \(-21 \div (-7)\)

13. \(-\frac{32}{4}\)  
14. \(\frac{45}{9}\)  
15. \(-\frac{45}{3}\)  
16. \(-\frac{25}{5}\)

17. \(\frac{35}{-7}\)  
18. \(-\frac{63}{-7}\)  
19. \(-\frac{144}{12}\)  
20. \(\frac{48}{-6}\)

Evaluate each expression if \(x = -8\) and \(y = -12\).

21. \(x \div 2\)  
22. \(x \div (-4)\)  
23. \(36 \div y\)  
24. \(0 \div y\)

25. \(-60 \div y\)  
26. \(56 \div x\)  
27. \(8 \div x\)  
28. \(-108 \div y\)

29. \(\frac{x}{-2}\)  
30. \(\frac{y}{3}\)  
31. \(\frac{0}{x}\)  
32. \(-\frac{112}{x}\)

33. \(\frac{y}{-6}\)  
34. \(\frac{x}{4}\)  
35. \(-\frac{144}{y}\)  
36. \(-\frac{136}{x}\)

Find the average (mean) of each group of numbers.

37. 3, 12, 6  
38. \(-8, -1, -3\)  
39. \(-8, 15, 5, 8\)  
40. \(-3, -10, 2, -4, 0\)

41. \(-10, -7, 7, 10\)  
42. \(12, 24, 9, 15, 18, 20, 16, 14\)  
43. \(-4, -11, -6, 1, 8, -12\)
Lesson 6 Skills Practice

Graphing in Four Quadrants

Name the ordered pair for each point graphed at the right.

1. A  
2. B  
3. C  
4. D  
5. E  
6. F  
7. G  
8. H  
9. I  
10. J

Graph and label each point on the coordinate plane. Name the quadrant in which each point is located.

11. K (1, 0)  
12. L (0, 2)  
13. M (−2, 4)  
14. N (−5, −4)  
15. P (6, −2)  
16. Q (7, −6)  
17. R (−3, −4)  
18. S (4, −7)  
19. T (3, 6)  
20. U (−7, 4)

21. Make a table of values and graph six sets of ordered pairs for the equation \( y = x - 4 \). Describe the graph.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
<th>((x, y))</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

\( y = x - 4 \)
Lesson 1 Skills Practice

Fractions and Decimals

Write each fraction as a decimal. Use a bar to show a repeating decimal.

1. \( \frac{3}{4} \)  
2. \( \frac{2}{5} \)  
3. \( \frac{5}{10} \)  
4. \( \frac{5}{5} \)  
5. \( \frac{13}{100} \)  
6. \( \frac{4}{5} \)  
7. \( \frac{7}{10} \)  
8. \( \frac{7}{8} \)  
9. \( \frac{1}{4} \)  
10. \( \frac{7}{50} \)  
11. \( -\frac{3}{10} \)  
12. \( \frac{1}{11} \)  
13. \( \frac{1}{8} \)  
14. \( \frac{1}{12} \)  
15. \( \frac{7}{30} \)  
16. \( \frac{1}{15} \)  
17. \( \frac{7}{11} \)  
18. \( -\frac{5}{9} \)  
19. \( -\frac{3}{5} \)  
20. \( \frac{1}{6} \)  

Replace each \( \bullet \) with \(<\), \(>\), or \(=\) to make a true sentence.

21. \( \frac{1}{8} \bullet 0.12 \)  
22. \( \frac{2}{3} \bullet 0.7 \)  
23. \( -\frac{3}{10} \bullet -0.3 \)  
24. \( 0.395 \bullet \frac{2}{5} \)  
25. \( 0.1 \bullet \frac{1}{11} \)  
26. \( 0.16 \bullet \frac{1}{6} \)  
27. \( \frac{3}{5} \bullet \frac{3}{4} \)  
28. \( -\frac{1}{4} \bullet -0.25 \)  

29. Order \( \frac{9}{11}, 0.99, \) and \( \frac{9}{10} \) from least to greatest.

30. Order \( 0.5, \frac{4}{9}, \) and \( \frac{2}{5} \) from least to greatest.
Lesson 2 Skills Practice

*Rational Numbers*

Write each number as a fraction.

1. 13
2. \(1 \frac{1}{4}\)
3. 57

4. \(-25\)
5. \(-3 \frac{4}{5}\)
6. \(6 \frac{5}{8}\)

7. \(-1\)
8. \(2 \frac{2}{9}\)
9. 12

Write each decimal as a fraction or mixed number in simplest form.

10. 0.6
11. 0.25
12. 0.4

13. \(-1.\overline{1}\)
14. 0.11
15. 2.8

16. 7.03
17. \(-2.\overline{12}\)
18. 3.2

19. 1.125
20. 8.65
21. 16.7

22. 0.16
23. 4.06
24. \(-5.\overline{8}\)

25. Write 85 hundredths as a fraction in simplest form.

26. Write 9 and 250 thousandths as a mixed number in simplest form.

Identify all sets to which each number belongs.

27. 16
28. \(-2.54\)
29. \(\frac{9}{3}\)

30. \(0.\overline{95}\)
31. \(-4\)
32. 2.2020020002...
Lesson 3 Skills Practice

Multiplying Rational Numbers

Find each product. Write in simplest form.

1. \( \frac{1}{3} \cdot \left( -\frac{1}{4} \right) \)
2. \( -\frac{2}{5} \cdot \frac{6}{7} \)
3. \( \frac{2}{7} \cdot \frac{3}{11} \)
4. \( \frac{3}{13} \cdot \frac{2}{5} \)
5. \( \frac{2}{9} \cdot \frac{3}{5} \)
6. \( \frac{3}{11} \cdot \frac{5}{9} \)
7. \( -\frac{1}{4} \cdot \frac{4}{9} \)
8. \( \frac{3}{5} \cdot \frac{15}{18} \)
9. \( \frac{3}{4} \cdot \frac{2}{5} \)
10. \( -\frac{1}{6} \cdot \left( -\frac{4}{7} \right) \)
11. \( \frac{5}{14} \cdot \left( -\frac{7}{9} \right) \)
12. \( -\frac{2}{3} \cdot \frac{9}{10} \)
13. \( \frac{5}{16} \cdot 4 \)
14. \( \frac{5}{2} \cdot \frac{2}{11} \)
15. \( -3 \cdot \left( -\frac{8}{9} \right) \)
16. \( -\frac{3}{5} \cdot \frac{6}{2}{3} \)
17. \( -12\frac{2}{3} \cdot 7\frac{1}{2} \)
18. \( -\frac{5}{36} \cdot \left( -\frac{9}{25} \right) \)
19. \( 8\frac{4}{5} \cdot 2\frac{5}{10} \)
20. \( 3\frac{1}{3} \cdot 9\frac{3}{4} \)
21. \( -6\frac{2}{5} \cdot \left( -\frac{2}{9} \right) \)
22. \( \frac{7}{45} \cdot \frac{9}{42} \)

Evaluate each expression if \( a = \frac{9}{12}, b = -2\frac{1}{4}, \) and \( c = \frac{2}{5}. \) Write the product in simplest form.

23. \( ab \)
24. \( -2b \)
25. \( \frac{5}{8}ac \)
26. \( 3bc \)
27. \( -\frac{5}{2}ab \)
28. \( \frac{1}{3}abc \)
Lesson 4 Skills Practice

Dividing Rational Numbers

Find the multiplicative inverse of each number.

1. \(\frac{7}{12}\)  
2. \(-\frac{3}{10}\)  
3. \(\frac{1}{8}\)

4. \(-64\)  
5. \(8\frac{1}{3}\)  
6. \(-10\frac{2}{3}\)

7. \(-6\frac{5}{6}\)  
8. \(1\frac{1}{8}\)  
9. \(20\)

Find each quotient. Write in simplest form.

10. \(\frac{1}{3} \div \frac{7}{18}\)  
11. \(-\frac{2}{5} \div \frac{4}{25}\)  
12. \(-5 \div \frac{1}{7}\)

13. \(\frac{2}{3} \div \frac{2}{3}\)  
14. \(\frac{4}{5} \div (-\frac{1}{15})\)  
15. \(\frac{19}{20} \div \frac{4}{5}\)

16. \(3 \div \frac{1}{4}\)  
17. \(-15 \div \frac{1}{2}\)  
18. \(\frac{4}{9} \div \frac{5}{12}\)

19. \(\frac{7}{10} \div (-\frac{4}{5})\)  
20. \(\frac{7}{12} \div (-\frac{1}{6})\)  
21. \(1\frac{5}{8} \div \frac{5}{8}\)

22. \(\frac{123}{5} \div 2\frac{7}{10}\)  
23. \(-\frac{3}{11} \div \frac{6}{22}\)  
24. \(\frac{1}{8} \div \frac{15}{16}\)

25. \(-\frac{123}{5} \div (-\frac{1}{15})\)  
26. \(1\frac{12}{13} \div \frac{25}{26}\)  
27. \(-\frac{7}{3} \div 2\frac{1}{5}\)

28. \(\frac{x}{6} \div \frac{x}{30}\)  
29. \(\frac{12}{5x} \div \frac{6}{2x}\)  
30. \(\frac{m}{16} \div \frac{mp}{7}\)

31. \(\frac{3r}{s} \div \frac{4rs}{s^2}\)  
32. \(\frac{a}{b} \div \frac{5}{b}\)  
33. \(\frac{2a}{b} \div \frac{3a^2}{b^2}\)

34. \(\frac{3}{5c} \div \frac{1}{10c}\)  
35. \(\frac{pq}{6} \div \frac{q}{8}\)  
36. \(\frac{x^2}{7} \div \frac{2x}{21}\)

37. \(\frac{gh}{6} \div \frac{36}{h}\)  
38. \(\frac{3n}{2m} \div \frac{5n}{5m}\)  
39. \(\frac{4b}{c} \div \frac{5bc}{c}\)

Math Accelerated • Chapter 3 Operations with Rational Numbers
Lesson 5 Skills Practice

Adding and Subtracting Like Fractions

Find each sum or difference. Write in simplest form.

1. \( \frac{4}{15} + \frac{6}{15} \)
2. \( \frac{7}{12} + \frac{11}{12} \)
3. \( \frac{7}{10} + \frac{9}{10} \)
4. \( \frac{20}{21} - \frac{2}{21} \)
5. \( \frac{11}{12} - \frac{5}{12} \)
6. \( \frac{5}{8} + \frac{7}{8} \)
7. \( \frac{10}{11} + \frac{9}{11} \)
8. \( \frac{17}{30} - \frac{7}{30} \)
9. \( \frac{5}{6} + \frac{5}{6} \)
10. \( 4 \frac{4}{5} + 3 \frac{2}{5} \)
11. \( 20 \frac{1}{25} + 1 \frac{4}{25} \)
12. \( 5 \frac{11}{15} + 3 \frac{14}{15} \)
13. \( 26 \frac{7}{12} + 11 \frac{11}{12} \)
14. \( 20 \frac{3}{4} - 3 \frac{1}{4} \)
15. \( 25 \frac{4}{5} - 3 \frac{2}{5} \)
16. \( \frac{10}{15} - \frac{13}{15} \)

Evaluate each expression if \( x = \frac{5}{8} \), \( y = 1 \frac{3}{8} \), and \( z = \frac{1}{8} \).

17. \( x + y \)
18. \( y - x \)
19. \( x - z \)
20. \( x + y + z \)

Find the distance between each set of points. Simplify, if necessary.

21. \(-\frac{2}{3} \) and \(-\frac{1}{3}\)
22. \(-\frac{2}{5} \) and \(\frac{1}{5}\)
23. \(-\frac{6}{7} \) and \(-\frac{3}{7}\)
24. \(-\frac{1}{6} \) and \(\frac{5}{6}\)
Lesson 6 Skills Practice

Adding and Subtracting Unlike Fractions

Find each sum or difference. Write in simplest form.

1. \( \frac{4}{7} + \frac{1}{3} \)

2. \( \frac{2}{5} + \frac{3}{4} \)

3. \( \frac{1}{2} + \left( -\frac{3}{10} \right) \)

4. \( -\frac{5}{6} + \frac{7}{9} \)

5. \( \frac{5}{12} + \frac{23}{24} \)

6. \( \frac{10}{11} - \frac{1}{2} \)

7. \( \frac{4}{5} - \left( -\frac{1}{3} \right) \)

8. \( \frac{5}{6} - \frac{1}{12} \)

9. \( \frac{19}{20} + \frac{1}{4} \)

10. \( -\frac{9}{10} - \frac{1}{3} \)

11. \( \frac{13}{15} - \frac{2}{3} \)

12. \( \frac{7}{10} + \frac{1}{5} \)

13. \( -\frac{3}{8} + \frac{1}{6} \)

14. \( \frac{33}{100} - \frac{1}{10} \)

15. \( \frac{11}{12} - \left( -\frac{7}{8} \right) \)

16. \( \frac{4}{5} - \frac{1}{8} \)

17. \( 5\frac{2}{3} + 2\frac{1}{6} \)

18. \( 1\frac{7}{8} + 3\frac{1}{3} \)

19. \( 3\frac{2}{3} - \frac{1}{9} \)

20. \( 23\frac{3}{4} - 12\frac{5}{16} \)

21. \( -7\frac{1}{2} + \frac{3}{4} \)

22. \( 2\frac{2}{3} + 1\frac{1}{4} \)

23. \( -12\frac{1}{2} - 17\frac{1}{2} \)

24. \( 12\frac{1}{3} - \frac{3}{5} \)

25. \( 11\frac{15}{16} - 7\frac{1}{2} \)

26. \( 8\frac{5}{9} + 1\frac{1}{6} \)

27. \( -7\frac{1}{2} + 3\frac{1}{7} \)

28. \( 60\frac{1}{2} + \left( -37\frac{1}{6} \right) \)

29. \( 8\frac{2}{3} - 3\frac{1}{3} \)

30. \( -21\frac{7}{16} + 13\frac{1}{4} \)
Lesson 1 Skills Practice

Powers and Exponents

Write each expression using exponents.

1. \(7 \cdot 7\)
2. \((-3)(-3)(-3)(-3)(-3)\)
3. \(4\)
4. \((k \cdot k)(k \cdot k)(k \cdot k)\)
5. \(p \cdot p \cdot p \cdot p \cdot p \cdot p\)
6. \(3 \cdot 3\)
7. \((-a)(-a)(-a)(-a)\)
8. \(6 \cdot 6 \cdot 6 \cdot 6\)
9. \(9 \cdot 9 \cdot 9\)
10. \(4 \cdot y \cdot z \cdot z \cdot z\)
11. \(r \cdot r \cdot r \cdot t \cdot u \cdot u\)
12. \(5 \cdot 5 \cdot 5 \cdot q \cdot q\)
13. \(8 \cdot 8 \cdot c \cdot c \cdot c \cdot c \cdot d \cdot d \cdot d\)
14. \((-w)(-w)(v)(v)(v)(v)\)
15. \(b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b \cdot b\)
16. \(10 \cdot 10 \cdot 10 \cdot (-2) \cdot (-2) \cdot (-2) \cdot m \cdot m \cdot m\)

Evaluate each expression if \(a = -3\), \(b = 8\), and \(c = 2\).

17. \(4^c\)
18. \(c^4\)
19. \(b^3\)
20. \(c^3 \cdot 3^c\)
21. \(3^c\)
22. \(c^6\)
23. \(c^2 + a\)
24. \(2b^2\)
25. \(b^3 + c^3\)
26. \(a^5\)
27. \(a^5\)
28. \(b^2 + a^3\)
29. \(b^2a\)
30. \((b - c)^2\)
Lesson 2 Skills Practice

Negative Exponents

Write each expression using a positive exponent.

1. \(3^{-4}\)  \hspace{1cm} 2. \(8^{-7}\)  \hspace{1cm} 3. \(10^{-4}\)

4. \((-2)^{-6}\) \hspace{1cm} 5. \((-40)^{-3}\) \hspace{1cm} 6. \((-17)^{-12}\)

7. \(n^{-10}\)  \hspace{1cm} 8. \(b^{-8}\)  \hspace{1cm} 9. \(q^{-5}\)

10. \(m^{-4}\)  \hspace{1cm} 11. \(v^{-11}\)  \hspace{1cm} 12. \(p^{-2}\)

Write each fraction as an expression using a negative exponent other than \(-1\).

13. \(\frac{1}{8^2}\)  \hspace{1cm} 14. \(\frac{1}{10^5}\) \hspace{1cm} 15. \(\frac{1}{2^3}\)

16. \(\frac{1}{6^7}\)  \hspace{1cm} 17. \(\frac{1}{17^4}\)  \hspace{1cm} 18. \(\frac{1}{21^2}\)

19. \(\frac{1}{3^7}\)  \hspace{1cm} 20. \(\frac{1}{9^2}\)  \hspace{1cm} 21. \(\frac{1}{3^2}\)

22. \(\frac{1}{121}\)  \hspace{1cm} 23. \(\frac{1}{25}\)  \hspace{1cm} 24. \(\frac{1}{36}\)

Evaluate each expression if \(x = 1\), \(y = 2\), and \(z = -3\).

25. \(y^{-z}\)  \hspace{1cm} 26. \(z^{-2}\)  \hspace{1cm} 27. \(x^{-8}\)

28. \(y^{-5}\)  \hspace{1cm} 29. \(z^{-3}\)  \hspace{1cm} 30. \(y^{-1}\)

31. \(z^{-4}\)  \hspace{1cm} 32. \(5^z\)  \hspace{1cm} 33. \(x^{-99}\)

34. \(1^z\)  \hspace{1cm} 35. \(4^z\)  \hspace{1cm} 36. \(y^z\)
Lesson 3 Skills Practice

Multiplying and Dividing Monomials

Find each product. Express using positive exponents.

1. \(2^3 \cdot 2^5\)  
2. \(10^2 \cdot 10^7\)

3. \(1^4 \cdot 1\)  
4. \(6^3 \cdot 6^{-3}\)

5. \((-3)^2(-3)^3\)  
6. \((-9)^2(-9)^2\)

7. \(a^2 \cdot a^3\)  
8. \(n^8 \cdot n^3\)

9. \((p^4)(p^4)\)  
10. \((z^6)(z^7)\)

11. \((6b^3)(3b^{-4})\)  
12. \((-v)^{-3}(-v)^7\)

13. \(11a^2 \cdot 3a^{-6}\)  
14. \(10t^2 \cdot 4t^{10}\)

15. \((8c^3)(9c)\)  
16. \((4f^9)(5f^6)\)

Find each quotient. Express using positive exponents.

17. \(\frac{5^{10}}{5^2}\)  
18. \(\frac{10^6}{10^2}\)

19. \(\frac{7^9}{7^6}\)  
20. \(\frac{12^8}{12^5}\)

21. \(\frac{100^9}{100^8}\)  
22. \(\frac{(-2)^3}{-2}\)

23. \(\frac{r^8}{r^2}\)  
24. \(\frac{z^{-10}}{z^2}\)

25. \(\frac{q^4}{q^6}\)  
26. \(\frac{g^{12}}{g^8}\)

27. \(\frac{(-y)^7}{(-y)^2}\)  
28. \(\frac{(-z)^{12}}{(-z)^5}\)

29. the product of two squared and two to the sixth power

30. the product of \(y^2\) and \(y^3\)

31. the quotient of \(a^{20}\) and \(a^{10}\)
Lesson 4 Skills Practice

Scientific Notation

Express each number in standard form.

1. \(1.5 \times 10^3\)
2. \(4.01 \times 10^4\)
3. \(6.78 \times 10^2\)
4. \(5.925 \times 10^6\)
5. \(7.0 \times 10^8\)
6. \(9.99 \times 10^7\)
7. \(3.0005 \times 10^5\)
8. \(2.54 \times 10^5\)
9. \(1.75 \times 10^4\)
10. \(1.2 \times 10^{-6}\)
11. \(7.0 \times 10^{-1}\)
12. \(6.3 \times 10^{-3}\)
13. \(5.83 \times 10^{-2}\)
14. \(8.075 \times 10^{-4}\)

Express each number in scientific notation.

15. 1,000,000
16. 17,400
17. 500
18. 803,000
19. 0.00027
20. 5300
21. 18
22. 0.125
23. 17,000,000,000
24. 0.01
25. 21,800
26. 2,450,000
27. 0.0054
28. 0.000099

Choose the greater number in each pair.

29. \(8.8 \times 10^3, 9.1 \times 10^{-4}\)
30. \(5.01 \times 10^2, 5.02 \times 10^{-1}\)
31. \(6.4 \times 10^3, 900\)
32. \(1.9 \times 10^{-2}, 0.02\)
33. \(2.2 \times 10^{-3}, 2.1 \times 10^2\)
34. \(8.4 \times 10^3, 839\)

Order each set of numbers from least to greatest.

35. \(3.6 \times 10^4, 5.8 \times 10^{-3}, 2.1 \times 10^6, 3.5 \times 10^5\)
36. \(64,000,000; 6.2 \times 10^6; 6,400,000; 6.4 \times 10^5\)
Lesson 5 Skills Practice

Compute with Scientific Notation

Evaluate each expression. Express the result in scientific notation.

1. \((8.3 \times 10^{-3})(69,500)\)
2. \((2.13 \times 10^{9})(5.6 \times 10^{-7})\)
3. \((4.3 \times 10^{5})(3.7 \times 10^{3})\)
4. \((3600)(7.5 \times 10^{-3})\)
5. \(\frac{1.8 \times 10^2}{7.5}\)
6. \(\frac{5.32 \times 10^6}{7.6 \times 10^{-2}}\)
7. \(\frac{3.6 \times 10^{-4}}{2.88 \times 10^3}\)
8. \(\frac{3.92 \times 10^{-3}}{9.8 \times 10^{-4}}\)
9. \((2.2 \times 10^{5})(2,500)\)
10. \((9.66 \times 10^{3})(2.6 \times 10^{-5})\)
11. \((5.24 \times 10^{-8})(6.9 \times 10^{3})\)
12. \((1.1 \times 10^{8})(7.7 \times 10^{-1})\)
13. \(\frac{9.45 \times 10^6}{2.7 \times 10^4}\)
14. \(\frac{1.8 \times 10^{-3}}{7.5 \times 10^{-1}}\)
15. \(\frac{26,607}{5.43 \times 10^2}\)
16. \(\frac{3.6 \times 10^{-1}}{4 \times 10^7}\)
17. \((1.6 \times 10^{3}) + (4.77 \times 10^{2})\)
18. \((8.735 \times 10^{4}) + (2.8 \times 10^{5})\)
19. \((3.31 \times 10^9) - (2.2 \times 10^6)\)
20. \((9.475 \times 10^{5}) - (1.9 \times 10^{3})\)
21. \((34,500) - (6.3 \times 10^{2})\)
22. \((8.8 \times 10^{7}) - (49,000)\)
23. \((7.28 \times 10^{10}) + (1.9 \times 10^{10})\)
24. \((3.325 \times 10^{5}) + (2.7 \times 10^{3})\)
25. \((4500) - (3.0 \times 10^{2})\)
26. \((7.89 \times 10^{6}) - (4.5 \times 10^{6})\)
27. \((7.7 \times 10^{9}) + (12,000)\)
28. \((5.62 \times 10^{3}) + (8.0 \times 10^{3})\)
29. \((9.13 \times 10^{9}) + (4.3 \times 10^{8})\)
30. \((7.1 \times 10^{7}) + (1,500,000)\)
31. \((1.78 \times 10^{7}) - (2.7 \times 10^{5})\)
32. \((8.9 \times 10^{6}) - (1.9 \times 10^{6})\)
Lesson 6 Skills Practice

Square Roots and Cube Roots

Find each square root.

1. \(\sqrt{1}\)  
2. \(\sqrt{9}\)  
3. \(\sqrt{25}\)  
4. \(\sqrt{49}\)  
5. \(\sqrt{64}\)  
6. \(\sqrt{169}\)  
7. \(-\sqrt{36}\)  
8. \(\sqrt{-81}\)  
9. \(-\sqrt{64}\)  
10. \(-\sqrt{169}\)  
11. \(\sqrt{-196}\)  
12. \(-\sqrt{121}\)  
13. \(\sqrt{225}\)  
14. \(\sqrt{441}\)  
15. \(\sqrt{625}\)  
16. \(\pm\sqrt{289}\)  
17. \(\pm\sqrt{324}\)  
18. \(\pm\sqrt{8100}\)  
19. \(\sqrt{2.25}\)  
20. \(\sqrt{0.16}\)  
21. \(\sqrt{3.24}\)  

Estimate each square root to the nearest integer.

22. \(\sqrt{38}\)  
23. \(\sqrt{84}\)  
24. \(\sqrt{389}\)  
25. \(\sqrt{5}\)  
26. \(\sqrt{118}\)  
27. \(\sqrt{230}\)  
28. \(-\sqrt{83}\)  
29. \(-\sqrt{19}\)  
30. \(-\sqrt{119}\)  

Find each cube root.

31. \(\sqrt[3]{-64}\)  
32. \(\sqrt[3]{-216}\)  
33. \(\sqrt[3]{-1000}\)  
34. \(\sqrt[3]{1}\)  
35. \(\sqrt[3]{-343}\)  
36. \(\sqrt[3]{125}\)  
37. \(\sqrt[3]{2197}\)  
38. \(\sqrt[3]{0}\)  
39. \(\sqrt[3]{216}\)  
40. \(\sqrt[3]{-27}\)  
41. \(\sqrt[3]{-1331}\)  
42. \(\sqrt[3]{512}\)  

Estimate each cube root to the nearest integer.

43. \(\sqrt[3]{205}\)  
44. \(\sqrt[3]{577}\)  
45. \(\sqrt[3]{-32}\)  
46. \(\sqrt[3]{908}\)  
47. \(\sqrt[3]{1012}\)  
48. \(\sqrt[3]{-736}\)  
49. \(\sqrt[3]{-611}\)  
50. \(\sqrt[3]{2698}\)  
51. \(\sqrt[3]{8564}\)
Lesson 7 Skills Practice

The Real Number System

Name all sets of numbers to which each real number belongs. Write natural, whole, integer, rational, or irrational.

1. 12
2. 25
3. −5
4. \( \frac{1}{8} \)
5. \( \frac{1}{9} \)
6. 0.343434…
7. \( \sqrt{31} \)
8. \( \sqrt{7} \)
9. \( \frac{25}{3} \)
10. \( -\frac{32}{4} \)
11. 6.54
12. 24.6
13. 418
14. 0
15. 0.050050005…

Determine whether each statement is sometimes, always, or never true.
16. A whole number is a rational number.
17. A rational number is a whole number.
18. A negative number is an integer.
19. Zero is an irrational number.

Replace each \(_{\_}\) with <, >, or = to make a true sentence.
20. \( \sqrt{4} \_ 2 \frac{3}{7} \)
21. \( \sqrt{5} \_ 2.1 \)
22. \( -\sqrt{12} \_ -3.5 \)
23. \( \sqrt{104.04} \_ 10.2 \)
24. 7.8 \_ \( \sqrt{55} \)
25. 15.1 \_ \( \sqrt{231} \)

Order each set of numbers from least to greatest.
26. 5 \( \frac{1}{3} \), 5.3, \( \sqrt{28} \), 2 \( \frac{1}{4} \)
27. \( \sqrt{53} \), 7 \( \frac{1}{4} \), \( \frac{36}{5} \), 7.27
28. −9.35, −\( \sqrt{72.75} \), −9 \( \frac{2}{10} \), −9

Solve each equation. Round to the nearest tenth, if necessary.
29. \( a^2 = 64 \)
30. \( d^2 = 169 \)
31. \( f^2 = 441 \)
32. −512 = \( g^3 \)
33. 115 = \( h^2 \)
34. \( k^3 = 9261 \)
35. \( b^3 = 4.41 \)
36. \( y^3 = 0.343 \)
37. \( m^3 = 0.0025 \)
Lesson 1 Skills Practice

Ratios

Express each ratio as a fraction in simplest form.

1. 8 pencils to 12 pens
2. 42 textbooks to 28 students

3. 27 rooms to 48 windows
4. 15 angel fish to 75 fish

5. 75 cats to 100 dogs
6. 6 aces out of 24 serves

7. 42 flowers to 7 vases
8. 14 boys to 21 girls

9. 50 nickels out of 125 coins
10. 9 children to 24 adults

11. 3 gallons to 15 quarts
12. 30 feet to 11 yards

13. 18 inches to 3 feet
14. 1 yard to 1 foot

15. 2 cups to 4 pints
16. 12 seconds to 1 minute

17. 3 pounds to 15 ounces
18. 15 inches to 2 yards

19. 1 pint to 4 quarts
20. 3 minutes to 1 hour

21. 8 ounces to 2 pounds
22. 7 quarts to 2 gallons

23. 6 ounces to 1 cup
24. 2 feet to 3 inches
Lesson 2 Skills Practice

Unit Rates

Express each rate as a unit rate. Round to the nearest tenth or nearest cent, if necessary.

1. $9 for 6 cans of soup

2. $39 for a case of 75 bananas

3. 108 miles in 6 days

4. 51 meters in 8 seconds

5. 21 new pairs of sneakers in 7 years

6. 52 feet for 8 costumes

7. 40 sneezes in 20 minutes

8. $2702 from 28 people

9. A 64-ounce container of sports juice costs $6.50. A 48-ounce container of the same juice costs $4.25. Which size container is the better buy?

10. Charmaine can knit 15 rows in 22 minutes. How many full rows could she knit in 90 minutes?

11. There are 156 sixth graders and 7 sixth-grade teachers. There are 120 fifth graders and 5 fifth-grade teachers. Which grade has the lower student to teacher ratio?

12. Cell phone Company X charges $15 for 120 minutes. Cell phone Company Y charges $25.95 for 300 minutes. Which company has the better per minute rate?

13. During normal sleep, a bear’s heart beats about 50 times a minute. In its deepest state of hibernation, a bear’s heart may beat 50 times in 6 minutes. During deep hibernation, how many times would the bear’s heart beat in 45 minutes?

14. An airplane traveled 1536 miles in 3 hours. At this same rate, how far could the plane travel in 8 hours?

15. An ice cream store makes 144 quarts of ice cream in 8 hours. How many quarts could be made in 12 hours?
Lesson 3 Skills Practice

Complex Fractions and Unit Rates

Simplify.

1. \( \frac{1}{2} - \frac{5}{5} \)

2. \( \frac{4}{5} - \frac{8}{8} \)

3. \( \frac{4}{8} - \frac{8}{8} \)

4. \( \frac{10}{5} - \frac{12}{12} \)

5. \( \frac{8}{3} - \frac{4}{4} \)

6. \( \frac{5}{7} - \frac{10}{10} \)

7. \( \frac{2}{5} - \frac{4}{9} \)

8. \( \frac{2}{5} - \frac{4}{9} \)

9. \( \frac{5}{6} - \frac{12}{12} \)

10. \( \frac{3}{8} - \frac{7}{12} \)

11. \( \frac{7}{9} - \frac{14}{14} \)

12. \( \frac{6}{7} - \frac{15}{15} \)

13. \( \frac{8}{11} - \frac{4}{5} \)

14. \( \frac{30}{5} - \frac{7}{7} \)

15. \( \frac{6}{7} - \frac{21}{21} \)

16. \( \frac{15}{5} - \frac{9}{9} \)

17. \( \frac{1}{3} - \frac{8}{9} \)

18. \( \frac{2}{3} - \frac{24}{25} \)
Lesson 4 Skills Practice

Converting Rates

Convert each rate using dimensional analysis. Round to the nearest hundredth.

1. 12 m/min = □ cm/s
2. 8 qt/min = □ gal/h

3. 44 yd/s = □ mi/h
4. 10 c/min = □ qt/h

5. 32 ft/h = □ yd/day
6. 56 mi/h = □ ft/min

7. 40 cm/s = □ m/min
8. 180 in./min = □ yd/h

9. 220 mi/h = □ yd/min
10. 3 km/h = □ m/s

11. 10 km/h ≈ □ mi/h
12. 40 gal/s ≈ □ L/h

13. 24 yd/min ≈ □ cm/min
14. 16 L/h ≈ □ gal/h

15. 300 mi/h ≈ □ km/min
16. 120 mi/day ≈ □ km/week

17. 100 L/day ≈ □ qt/h
18. 55 m/min ≈ □ in./s

19. 12 pt/h ≈ □ L/min
20. 2800 mi/h ≈ □ km/h

Complete each conversion. Round to the nearest hundredth.

21. 5 m ≈ □ yd
22. 1500 mi ≈ □ m

23. 20 L ≈ □ gal
24. 70 kg ≈ □ lb

25. 42 in. ≈ □ cm
26. 38 ft ≈ □ m

27. 2 kg ≈ □ oz
28. 55 oz ≈ □ g

29. 1200 km ≈ □ ft
30. 18 qt ≈ □ mL
Lesson 5 Skills Practice

Proportional and Nonproportional Relationships

Determine whether the set of numbers in each table is proportional. If the relationship is proportional, identify the constant of proportionality. Explain your reasoning.

1. Number of Socks | 1 | 2 | 3 | 4
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$2</td>
<td>$4</td>
<td>$6</td>
<td>$6</td>
</tr>
</tbody>
</table>

2. Number of Guests | 2 | 4 | 6 | 8
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cookies</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

3. Days | 1 | 3 | 5 | 6
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages Read</td>
<td>100</td>
<td>300</td>
<td>550</td>
<td>600</td>
</tr>
</tbody>
</table>

4. Cups of Flour | 2 | 4 | 8 | 10
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaves of Bread</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Complete each table. Determine whether the pattern forms a proportion. If the relationship is proportional, identify the constant of proportionality.

5. Aliya earns $7 per hour baby-sitting her neighbors.

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings</td>
<td>$7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Antonio’s Pizzaria charges $10 for a large pizza, plus $1.50 for each additional topping.

<table>
<thead>
<tr>
<th>Number of Toppings</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. On a cross-country road trip, a family drives 240 miles each day. Find the constant of proportionality. Then write an equation relating distance to time. How far has the family traveled after 4 days?
Lesson 6 Skills Practice

Graphing Proportional Relationships

Determine whether each relationship is proportional by graphing on a coordinate plane. Explain your reasoning.

1. | Time (hr) | 0 | 1 | 2 | 3 | 4 |
   | Distance (mi) | 0 | 45 | 90 | 135 | 180 |

2. | Number of Tickets | 4 | 8 | 12 | 16 | 20 |
   | Cost ($) | 100 | 190 | 264 | 316 | 340 |

3. | Number of Chicken Dinners | 2 | 4 | 6 | 8 | 10 |
   | Cost ($) | 12 | 24 | 36 | 48 | 60 |

Find and interpret the constant of proportionality.

4. The number of lifeguards on duty at the local swim club is proportional to the number of swimmers. The graph shows the relationship (swimmers, lifeguards).
Lesson 7 Skills Practice

Solving Proportions

Solve each proportion.

1. \( \frac{a}{5} = \frac{4}{20} \)
2. \( \frac{3}{8} = \frac{12}{m} \)
3. \( \frac{4}{5} = \frac{y}{10} \)

4. \( \frac{12}{20} = \frac{c}{30} \)
5. \( \frac{3}{r} = \frac{27}{36} \)
6. \( \frac{d}{18} = \frac{2}{9} \)

7. \( \frac{g}{9} = \frac{2}{3} \)
8. \( \frac{15}{18} = \frac{k}{12} \)
9. \( \frac{15}{24} = \frac{3}{p} \)

10. \( \frac{v}{72} = \frac{50}{100} \)
11. \( \frac{10}{8.4} = \frac{z}{4.2} \)
12. \( \frac{12}{4.8} = \frac{w}{3.2} \)

13. \( \frac{8}{4} = \frac{t}{8} \)
14. \( \frac{n}{9} = \frac{4}{18} \)
15. \( \frac{3}{v} = \frac{12}{32} \)

16. \( \frac{25}{60} = \frac{s}{12} \)
17. \( \frac{21}{28} = \frac{3}{w} \)
18. \( \frac{c}{12} = \frac{5}{6} \)

19. \( \frac{4}{r} = \frac{5}{20} \)
20. \( \frac{12}{18} = \frac{m}{81} \)
21. \( \frac{2}{9} = \frac{6}{k} \)

22. \( \frac{h}{35} = \frac{3}{7} \)
23. \( \frac{3}{16} = \frac{u}{40} \)
24. \( \frac{6}{a} = \frac{1}{3} \)

25. \( \frac{e}{9.5} = \frac{6.4}{7.6} \)
26. \( \frac{2.7}{3} = \frac{3.6}{x} \)
27. \( \frac{1.68}{w} = \frac{7}{12} \)
Lesson 8 Skills Practice

Scale Drawings and Models

On a set of architectural drawings for a new school building, the scale is \( \frac{1}{4} \) inch = 2 feet. Find the missing lengths of the rooms.

<table>
<thead>
<tr>
<th>Room</th>
<th>Drawing Length</th>
<th>Actual Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lobby</td>
<td></td>
<td>16 feet</td>
</tr>
<tr>
<td>2. Principal's Office</td>
<td>1.25 inches</td>
<td></td>
</tr>
<tr>
<td>3. Library</td>
<td></td>
<td>20 feet</td>
</tr>
<tr>
<td>4. School Room</td>
<td>3 inches</td>
<td></td>
</tr>
<tr>
<td>5. Science Lab</td>
<td>1.5 inches</td>
<td></td>
</tr>
<tr>
<td>6. Cafeteria</td>
<td></td>
<td>48 feet</td>
</tr>
<tr>
<td>7. Music Room</td>
<td>4 inches</td>
<td></td>
</tr>
<tr>
<td>8. Gymnasium</td>
<td>13 inches</td>
<td></td>
</tr>
<tr>
<td>9. Auditorium</td>
<td></td>
<td>56 feet</td>
</tr>
<tr>
<td>10. Teachers' Lounge</td>
<td>1.75 inches</td>
<td></td>
</tr>
</tbody>
</table>

11. Refer to Exercises 1—10. What is the scale factor?

12. What is the scale factor if the scale is 10 inches = 1 foot?

13. A barn is 40 feet wide by 100 feet long. Make a scale drawing of the barn that has a scale of \( \frac{1}{2} \) inch = 10 feet.

14. On a map, the key indicates that 1 centimeter equals 3.5 meters. A road is shown on this map that runs for 30 centimeters. How long is this road?

15. The Golden Gate Bridge is 8980 feet long. For a science project, Gabriel built a scale model of the bridge. How long is the model if he used the scale 1 millimeter = 20 feet?

16. Miley has a photograph that is 10 centimeters by 15 centimeters. She wants to enlarge the photograph using the scale is 1 centimeter = 1.5 inches. What are the dimensions of the enlarged photograph?

17. On a map, the key indicates that 1 inch equals 50 miles. It is 600 miles from Ricky's house to the Willis Tower in Chicago. What is the distance from Ricky's house to the Willis Tower on the map?
Lesson 9 Skills Practice

Similar Figures

The figures are similar. Find each missing measure.

1. △ABC
   - A: 3 in.
   - B: 4 in.
   - C: 6 in.
   - x in.

2. PMN
   - P: 5 m
   - M: 2 m
   - N: x m
   - O: 4 m

3. HJL
   - G: 6 ft
   - J: 8 ft
   - I: x ft
   - L: x ft

4. PQR
   - P: 12 m
   - Q: x m
   - R: 18 m

5. VWN
   - U: 15 m
   - V: x cm
   - W: 24 cm
   - N: 21 cm

6. ABCD
   - E: 10 in.
   - F: 8 in.
   - G: 16 in.
   - H: x in.

7. GHI
   - H: 18 m
   - I: x m
   - J: 35 m

8. MNO
   - N: 10 yd
   - O: 15 yd
   - M: 12 yd

9. How far is the store from the bank?

10. How far is the tree from the flagpole?
Lesson 10 Skills Practice

Indirect Measurement

1. At the same time a 12-foot adult elephant casts a 4.8-foot shadow, a baby elephant casts a 2-foot shadow. How tall is the baby elephant?

2. If a 12-meter-tall airplane hangar casts a 18-meter shadow at the same time a parked jet casts a 6-meter shadow, how tall is the jet?

3. Suppose a Ferris wheel is 160 feet high and casts a shadow that is 64 feet long. At the same time, a ticket booth next to the Ferris wheel casts a shadow that is 2.8 feet long. What is the height of the ticket booth?

4. A building casts a shadow that is 72 feet long. A garage next to the building is 27 feet high and casts a shadow that is 4.5 feet long. What is the height of the building?

5. A silo casts a shadow that is 99 feet long. Next to the silo is an 18-foot-tall barn that casts a shadow that is 13.5 feet long. How tall is the silo?

6. In New Salem, North Dakota, there is a 38-foot-tall statue of a cow named Salem Sue. Suppose the statue’s shadow was 57 feet long and a 3.5-foot child was standing next to the statue. How long would the child’s shadow be?

7. The triangles below are similar. How far is Clayton from Wiley’s Junction?

8. The triangles below are similar. What is the distance between the skate park and the movie theater?
Lesson 1 Skills Practice

Using the Percent Proportion

Use the percent proportion to solve each problem. Round to the nearest tenth, if necessary.

1. 64 is what percent of 200?
2. What percent of 12 is 9?

3. 2 is what percent of 80?
4. What percent of 42 is 32?

5. 10 is what percent of 80?
6. What percent of 30 is 6?

7. 15 is what percent of 24?
8. What percent of 36 is 9?

9. 28 is what percent of 42?
10. What percent of 72 is 21?

11. 8 is 40% of what number?
12. 16 is 5% of what number?

13. 25 is 80% of what number?
14. 0.84 is 28% of what number?

15. 71 is 10% of what number?
16. 52 is 97% of what number?

17. 39 is 17% of what number?
18. 12 is 4% of what number?

19. 48.5 is 7% of what number?
20. What is 10.6% of 11?

21. What is 15% of 98.4?
22. What is 0.5% of 75?

23. What is 4% of 512.5?
24. What is 50% of 1?

25. What is 25% of 12?
26. What is 12% of 25?

27. What is 90% of 50?
28. What is 50% of 90?
Lesson 2 Skills Practice

Find Percent of a Number Mentally

Find the percent of each number mentally.

1. 10% of 582
2. 50% of 86
3. 40% of 1500

4. 20% of 75
5. 15% of 20
6. 80% of 45

7. 30% of 120
8. 75% of 44
9. 5% of 40

10. 33\(\frac{1}{3}\)% of 99
11. 60% of 450
12. 37\(\frac{1}{2}\)% of 56

13. 25% of 480
14. 300% of 5
15. 150% of 82

16. 66\(\frac{2}{3}\)% of 210
17. 125% of 800
18. 175% of 400

Estimate.

19. 28% of 19
20. 55% of 32
21. 87% of 158

22. 35% of 544
23. 42% of 495
24. 19% of 319

25. 65% of 73
26. 8% of 224
27. 83% of 9

28. 17% of 331
29. 78% of 14
30. 12% of 879

31. \(\frac{1}{3}\)% of 941
32. \(\frac{1}{2}\)% of 376
33. \(\frac{1}{5}\)% of 2052

34. 164% of 318
35. 247% of 192
36. 508% of 1073
Lesson 3 Skills Practice

Using the Percent Equation

Solve each problem using a percent equation.

1. What is 5% of 80?  
2. What is 10% of 100?

3. What is 58% of 35?  
4. What is 32% of 150?

5. What is 91% of 3800?  
6. Find 25% of 68.

7. Find 80% of 75.  
8. Find 75% of 80.

9. Find 1.5% of 8400.  
10. Find 33.5% of 22.

11. 23 is what percent of 115?  
12. 27 is what percent of 75?

13. 80 is what percent of 160?  
14. 85 is what percent of 500?

15. 48 is what percent of 30?  
16. 321.3 is what percent of 918?

17. 0.6 is what percent of 2?  
18. 126 is what percent of 140?

19. 21 is what percent of 1050?  
20. 78 is what percent of 40?

21. 29 is 50% of what number?  
22. 9 is 45% of what number?

23. 16 is 4% of what number?  
24. 336 is 48% of what number?

25. 52 is 25% of what number?  
26. 99 is 90% of what number?

27. 343 is 70% of what number?  
28. 57 is 1% of what number?

29. 193.6 is 32% of what number?  
30. 87.1 is 67% of what number?
Lesson 4 Skills Practice

Percent of Change

Find the percent of change. Round to the nearest tenth, if necessary. Then state whether the percent of change is an increase or decrease.

1. from 12 m to 18 m
2. from 27 days to 30 days
3. from $48.50 to $38.80
4. from 25 lb to 12 lb
5. from 10 mm to 3 mm
6. from $875 to $1000
7. from $18.10 to $22.50
8. from 32 people to 3040 people
9. from 28 stray cats to 5 stray cats
10. from 12 words to 90 words

Find the percent error.

11. actual speed: 38 mph, estimated speed: 35 mph
12. estimated length: 45 cm; actual length: 50 cm
13. projected growth: 2 inches, actual growth 3 inches
14. estimated weight: 200 pounds, actual weight: 230 pounds
15. actual cost: $75, estimated cost: $66
16. actual capacity: 16 quarts, estimated capacity 13 quarts
17. actual time: 58 minutes, projected time: 45 minutes
18. actual distance: 100 yards, estimated distance 85 yards
19. estimated mass: 300 kilograms, actual mass: 284 kilograms
20. actual length: 35 centimeters, estimated length 36 centimeters
Lesson 5 Skills Practice

Discount and Markup

Find the selling price for each item given the cost and the percent of the markup or discount.

1. necklace: $30; 25% markup

2. scooter: $15; 55% markup

3. tennis shoes: $48; 10% discount

4. computer: $200; 36% markup

5. watch: $22.50; 50% markup

6. video game: $40; 28% discount

7. jeans: $18; 33% markup

8. car: $16,000; 10% markup

9. purse $120; 15% discount

10. shoes: $25; 10% markup

11. charm bead; $60; 40% discount

12. belt: $40; 10% discount

13. shirt: $15; 8% markup

14. backpack: $35; 12% markup

15. book: $39; 20% discount

16. waffle iron: $28; 18% markup

17. earrings: $12; 5% discount

18. football ticket: $135; 3% markup

19. recliner: $275; 10% discount

20. baseball glove: $80; 20% discount
Lesson 6 Skills Practice
Simple and Compound Interest

Find the simple interest to the nearest cent.

1. $720 at 8% for 5 years
2. $385 at 6.2% for 3 years
3. $1200 at 4.25% for 18 months
4. $1950 at 7.5% for 6 months
5. $4250 at 9% for 10 years
6. $2008 at 6% for 3 months
7. $680 at 8% for 48 months
8. $1111 at 11% for 11 years
9. $1620 at 5.75% for 9 months
10. $800 at 12.5% for 2 years
11. $9500 at 3.3% for 30 months
12. $50 at 13.5% for 20 years

Find the total amount in each account to the nearest cent if the interest is compounded annually.

13. $2200 at 5% for 2 years
14. $3850 at 6.25% for 3 years
15. $4075 at 4.25% for 3 years
16. $325 at 7% for 6 years
17. $1000 at 12.25% for 4 years
18. $14,950 at 5.85% for 5 years
19. $750 at 12% for 2 years
20. $620 at 10.5% for 2 years
21. $4050 at 8.5% for 4 years
22. $1986 at 8.6% for 3 years
23. $11,300 at 9.1% for 3 years
24. $575 at 2.8% for 4 years

Math Accelerated • Chapter 6 Percents
Lesson 1 Skills Practice

The Distributive Property

Use the Distributive Property to write each expression as an equivalent expression. Then evaluate the expression.

1. $8(50 + 4)$  
2. $(20 + 9)5$  
3. $2(60 + 4)$  
4. $7.5(40 - 2)$

5. $\frac{1}{2}(400 - 2)$  
6. $-4(16 + 5)$  
7. $-8(4 + 1)$  
8. $9(24 - 19)$

9. $-3(7 - 11)$  
10. $-10(12 - 4)$  
11. $(21 + 9)(-5)$  
12. $-7(1 - 10)$

13. $-2(1 - 6)$  
14. $4(15 + 25)$  
15. $\frac{1}{10}(100 + 6)$  
16. $12(22 - 52)$

Use the Distributive Property to write each expression as an equivalent algebraic expression.

17. $4(d + 2)$  
18. $1(u - 3)$  
19. $-6(f + 5)$  
20. $-2(g - 3)$

21. $3.4(x - 7)$  
22. $8(-b + 4)$  
23. $(9 - h)5$  
24. $(c + 1)(-4)$

25. $-1(2 - y)$  
26. $-7(a + 1)$  
27. $11(k - 20)$  
28. $-9(r - 1)$

29. $5(1 - b)$  
30. $\frac{1}{6}(x + 12)$  
31. $-6(p + 15)$  
32. $4(h - 16)$

33. $-3(w - 10)$  
34. $-10(c + 9)$  
35. $2.5(11 - q)$  
36. $-4(f - 12)$

37. $12(n + 2)$  
38. $16(g + 1)$  
39. $-8(b + 9)$  
40. $-5(z - 4)$

41. $6(r - 20)$  
42. $7(j - 2)$  
43. $-1(m + 1)$  
44. $-2(v - 8)$
Lesson 2 Skills Practice

Simplifying Algebraic Expressions

Identify the terms, like terms, coefficients, and constants in each expression.

1. \(7a + a\)
2. \(3k + g - k\)
3. \(m + 3m + 8\)
4. \(10b - bc + 1 + 3bc\)
5. \(9j + 8j - 4 - 7j\)
6. \(6y + 3x + 6y - 2x\)
7. \(3q + 2 - 7p\)
8. \(18 + 7x - 12 + 5x\)
9. \(12a + 3b + 18 - 9a\)

Simplify each expression.

10. \(13c - 7 + c - d\)
11. \(5h + h - 4h + 1 - 2h\)
12. \(2(v - 5) + 7v + 4\)
13. \(5(r + 9) - 5\)
14. \(1 - 4(u - 1)\)
15. \(-7(w - 4) + 3w - 27\)
16. \(-8 - 7(y + 2)\)
17. \(-18(c - 1) - 18\)
18. \(12(n - 4) - 3n\)
19. \(5m - 9 + 4m\)
20. \(-7 + g + 1 - 6g\)
21. \(x - 9x + 3 + 8x - 3\)
22. \(6(r - 4) + r + 30 - 7r\)
23. \(-5 + 5a - 4 - 2a + 3a\)
24. \(21 - 8(v + 3) + 3 + 7v\)
25. \(4x - 9 + 3x + 6 - 9x - 4\)
26. \(p - 2 + 1 - p + 1 + 2p\)
27. \(-11f + 6 - f + 4 + 13f - 9\)
28. \(3(d - 4) + 2 - 2d + 1 - d\)
29. \(1 - s + 2 + 2s - 3s + 1\)
30. \(5 - 9k + 1 + k - 2(7 - k)\)
Lesson 3 Skills Practice

Adding Linear Expressions

Add. Use models if needed.

1. \((x + 8) + (6x + 3)\)  
2. \((-2x + 8) + (-4x + 2)\)

3. \((7x + 2) + (6x + 12)\)  
4. \((10x - 4) + (12x + 8)\)

5. \((-2x + 1) + (-x + 5)\)  
6. \((9x - 1) + (-5x - 3)\)

7. \((7x + 4) + (3x - 9)\)  
8. \((-8x + 4) + (-3x + 2)\)

9. \((-2x + 3) + (2 + 6x)\)  
10. \((4x - 7) + (-6x + 18)\)

11. \((8x + 1) + (5x + 2)\)  
12. \((-x + 3) + (-4 - 7x)\)

13. \((-5x - 3) + (-4x - 7)\)  
14. \((2x + 3) + (x + 3)\)

15. \((11x + 6) + (-8x + 3)\)  
16. \((15x - 16) + (20x + 13)\)

17. \((12x - 23) + (17 + 4x)\)  
18. \((-x - 1) + (-5x + 11)\)

19. \((-20x + 15) + (14x - 19)\)  
20. \((4x + 9) + (10x - 5) + (-11x - 2)\)

21. \((2x + 1) + (4x - 3) + (x + 4)\)  
22. \((-x - 5) + (4x - 6) + (-x + 14)\)

23. \((9x + 4) + (-3x + 7) + (-2x - 1)\)  
24. \((5x + 4) + (-7x - 8) + (-2x + 1)\)
Lesson 4 Skills Practice

Subtracting Linear Expressions

Subtract. Use models if needed.

1. \((3x - 3) - (x - 1)\)
2. \((2x + 3) - (2x + 1)\)

3. \((x - 7) - (x - 2)\)
4. \((6x + 1) - (x + 1)\)

5. \((-12x - 5) - (6x - 8)\)
6. \((-3x - 5) - (-2x + 1)\)

7. \((8x - 4) - (-3 + 2x)\)
8. \((7x - 12) - (4x - 3)\)

Write the subtraction problems modeled in the problems shown.

9. 

10. 

Subtract. Use models if needed.

11. \((3x - 2) - (x - 5)\)
12. \((5x + 3) - (x + 6)\)

13. \((x - 1) - (x - 4)\)
14. \((4x + 1) - (2x + 5)\)

15. \((5x - 3) - (-7x - 3)\)
16. \((-x - 2) - (-3x + 9)\)

17. \((-8x + 6) - (7x + 2)\)
18. \((7x - 6) - (4x - 10)\)
Lesson 5 Skills Practice

Factoring Linear Expressions

Factor each expression. If the expression cannot be factored, write cannot be factored. Use algebra tiles if needed.

1. 17x + 34
2. 10x + 25

3. 30x + 18
4. 45x - 18

5. 38x - 12
6. 28x + 15

7. 3x - 27
8. 6x + 24

9. 26x - 5
10. 48x + 56

11. 15x - 14
12. 20x - 100

13. 7x + 35
14. 7x + 17

15. 9x - 63
16. 39x + 13

17. 8x + 15
18. 18x - 12

19. The area of a rectangular sandbox is (5x + 40) square feet. Factor 5x + 40 to find possible dimensions of the sandbox.
Lesson 1 Skills Practice

Solving Equations with Rational Coefficients

Solve each equation. Check your solutions.

1. \(3.2x = 25.6\)  
2. \(-\frac{1}{5} m = -15\)  
3. \(-4.5f = 18\)  
4. \(\frac{1}{2}u = 12\)

5. \(-2a = 6.4\)  
6. \(-\frac{1}{2}s = 10\)  
7. \(-2y = -2\)  
8. \(-7.3z = 7.3\)

9. \(\frac{1}{8}n = -24\)  
10. \(-\frac{3}{4}r = -\frac{1}{4}\)  
11. \(-9.7h = 87.3\)  
12. \(-\frac{1}{10}c = 1\)

13. \(-\frac{1}{15}v = -15\)  
14. \(\frac{1}{12}m = 0\)  
15. \(-12.6g = 12.6\)  
16. \(-\frac{1}{4}w = 0\)

17. \(-1.5f = 16.5\)  
18. \(-\frac{1}{2}r = 22\)  
19. \(\frac{1}{3}d = -\frac{1}{6}\)  
20. \(\frac{1}{15}r = 45\)

21. \(\frac{2}{5}k = -2\)  
22. \(-3p = 18\)  
23. \(\frac{3}{7}j = -63\)  
24. \(-\frac{1}{10}y = 10\)

25. \(-\frac{1}{8}x = -1\)  
26. \(5.5g = -22\)  
27. \(\frac{1}{6}p = 0\)  
28. \(7.9y = 11.85\)

29. \(-6q = -30\)  
30. \(-1.2c = -6\)  
31. \(-\frac{9}{10}b = 9\)  
32. \(-4k = -120\)

33. \(2.8r = 1.68\)  
34. \(-1.3t = 24.7\)  
35. \(-\frac{1}{12}n = 12\)  
36. \(-\frac{1}{5}j = 16\)

37. \(-\frac{1}{11}u = 11\)  
38. \(\frac{3}{5}c = \frac{3}{35}\)  
39. \(-9q = -36\)  
40. \(9z = -144\)
Lesson 2 Skills Practice

Solving Two-Step Equations

Solve each equation. Check your solutions.

1. $3x + 10 = 1$
2. $\frac{1}{5}a + 8 = 9$
3. $8w - 12 = -4$

4. $\frac{1}{2}r + 6 = 5$
5. $18 - 2.3q = 1.9$
6. $3j - 20 = 16$

7. $\frac{1}{12}u - 8 = -8$
8. $7p + 11 = 46.7$
9. $12.5d + 15 = -3.75$

10. $4c + 20 = 0$
11. $\frac{1}{2}n - 9 = -5$
12. $10b - 19 = 11$

13. $\frac{2}{5}h + 10 = 6$
14. $6k - 9 = 15$
15. $-\frac{1}{5}w - 4 = -2$

16. $12 - 7y = -4.8$
17. $11 - 3g = 32$
18. $12s + 13 = 25$

19. $2z - 4 - z = 4$
20. $10.1 - 5h + 2.5 = 32.6$
21. $-\frac{1}{7}r - 5 = -6$

22. $-4a + 5 - 2a - 9 = 44$
23. $-\frac{1}{3}w + 6 - 1 = 2$
24. $7k - 8k = 1$

25. $7.25f - 24.5 = 26.25$
26. $6 - \frac{1}{6}m - 8 = 0$
27. $10 - d = 19$

28. $9x + 5 - 4x = -20$
29. $3 - 4t + 11 = 20$
30. $\frac{1}{3}a - 4 + 9 = 7$

31. $\frac{5}{6}q - 4 = -14$
32. $\frac{1}{8}m - 12 - 3 = -12$
33. $5b + 6 - 6b + 2 = 19$
Lesson 3 Skills Practice

Writing Equations

Translate each sentence into an equation.

1. Eleven less than 5 times a number is 24.

2. The quotient of a number and −9 increased by 10.3 is 11.3.

3. Five less than the product of −3 and a number is −2.

4. Fifteen more than twice a number is −23.

5. The difference between one fifth of a number and 4 is 16.

6. Nine more than −8 times a number is −7.

7. The difference between 12 and one tenth of a number is −28.

8. Seven and six tenths more than three times a number is 52.6.

9. Eleven less than five times a number is 19.

10. Thirteen more than four times a number is −93.

11. Seven less than twice a number is 43.

Solve each problem by writing and solving an equation.

12. The total cost of a suit and 4 ties is $292. The suit cost $200. Each tie cost the same amount. Find the cost of one tie.

13. Mary’s sister is 7 years older than Mary. Their combined ages add up to 35. How old is Mary?
Lesson 4 Skills Practice

More Two-Step Equations

Solve each equation.

1. $3(n - 2) = 15$
2. $4(x + 2) = 28$
3. $56 = 8(p - 5)$

4. $36 = 6(y + 2)$
5. $\frac{1}{4}(d - 1) = 16$
6. $\frac{2}{3}(t + 5) = 8$

7. $14 = \frac{7}{8}(q + 3)$
8. $\frac{1}{6}(k - 9) = 4$
9. $0.4(f + 8) = 12$

10. $2.5(z + 7) = 13$
11. $\frac{2}{5}(c + 8.5) = 18$
12. $6(r + 8) = 20.4$

13. $5(g - 10) = 45$
14. $49 = \frac{7}{9}(y + 4)$
15. $-3(u + 6) = -27$

16. $4(x + 3) = 7$
17. $2(y - 5) = 5$
18. $-7(q + 1) = 3$

19. $48 = -16(d + 5)$
20. $22 = -1(t - 11)$
21. $5(j - 12) = 14$

22. $\frac{3}{8}(h + 13) = -24$
23. $1.4(s + 6) = 7$
24. $200 = 10(x + 17)$

25. $-8 = 5(m + 2)$
26. $3(p + 1) = -12$
27. $\frac{1}{4}(x - 5) = -3\frac{1}{4}$
Lesson 5 Skills Practice
Solving Equations with Variables on Each Side

Solve each equation. Check your solutions.

1. $3x + 2 = 5x$
2. $n - 12 = 3n$
3. $2 - 3b = 7b + 12$
4. $\frac{3}{4}d - 11 = \frac{1}{4}d - 6 \frac{1}{2}$
5. $2f + 3 = 11f - 24$
6. $8y + 11 = 2y + 29$
7. $5a = -3 + \frac{3}{5}a$
8. $17 - 3c = 4c + 3$
9. $2a - 3 = 9a - 10$
10. $5b = 21 + 4b$
11. $3(y - 3) = -2y + 6$
12. $3n - 5 = 7n$
13. $-s + 3 = 5s + 21$
14. $7.2 - 4c = 3c + 35.2$
15. $33 - 2n = 4n$
16. $29 + 7d = 5d + 15$
17. $16k - 23 = 6k - 13$
18. $\frac{7}{10}w - 18 = 5 \frac{1}{5}w$
19. $3.3g + 2.8 = 2.5g - 1.2$
20. $6h - 34 = -6h + 14$
21. $3t + 17 = t - 3$
22. $11j = 6j - 15$
23. $c - 2 = 3c + 14$
24. $28x - 10 = 26x + 5$
25. $5m - 6 = 8m + 9$
26. $-4p - 7 = 5p + 11$
27. $-10.4 + 3.2f = 5f + 4$
28. $2(f + 3) = 8f - 14$
29. $-7n - 16 = 4n + 17$
30. $5d = 9d - 18$

Write an equation to find each number. Then solve.

31. Three times a number equals 40 more than five times the number. What is the number?

32. A number equals four less than three times the number. What is the number?

33. Eight times a number equals 24 more than two times the number. What is the number?
Lesson 6 Skills Practice

Inequalities

Write an inequality for each sentence.

1. More than 100,000 fans attended the opening football game at The Ohio State University.

2. Her earnings at $16 per hour were no more than $96.

3. A savings account decreased by $50 is now less than $740.

4. A number increased by 7 is at least 45.

For the given value, state whether each inequality is true or false.

5. $\frac{18}{c} < 9, c = 2$

6. $\frac{x}{5} \geq 3, x = 5$

7. $6k \geq 42, k = 7$

8. $10 - x < 3, x = 7$

9. $11 + n < 32, n = 4$

10. $9 + c > 19, c = 10$

Graph each inequality on a number line.

11. $a < 6$

12. $t \geq -2$

13. $d \leq 3$

14. $b \geq 10$

15. $x \geq -7$

16. $x > 2$

Write an inequality for each graph.

17. 

18. 

19. 

20. 

21. 

22. 

Math Accelerated • Chapter 8 Equations and Inequalities
Lesson 7 Skills Practice

**Solving Inequalities**

Solve each inequality. Check your solutions.

1. \( p + 9 > 13 \)
2. \( t + 7 < -4 \)
3. \( -12 \geq 7 + x \)
4. \( 5 > -3 + y \)
5. \( r + 7 \leq -3 \)
6. \( b - 15 > 11 \)
7. \( j - 4 \leq -10 \)
8. \( -5 > h - 3 \)
9. \( 13 > w - (-14) \)
10. \( -15 \leq d + (-2) \)
11. \( 2 + c \leq -8 \)
12. \( 15 > c + 3 \)

Solve each inequality. Graph each solution on a number line.

13. \( -8x > 16 \)
14. \( 7y < -35 \)

15. \( 12a \geq -24 \)
16. \( -12 \leq 4a \)

17. \( -6z < -18 \)
18. \( 14 > -2k \)

19. \( 5 > \frac{x}{-2} \)
20. \( \frac{r}{-3} \leq -4 \)

21. \( -10t \geq 200 \)
22. \( \frac{y}{7} < 2 \)

23. \( -\frac{1}{2} x \leq -6 \)
24. \( \frac{b}{-3} \leq 6 \)
Lesson 8 Skills Practice

Solving Multi-Step Equations and Inequalities

Solve. Check your solutions.

1. \(2(g - 7) = 16\)  
2. \(5(x + 2) = 30\)  
3. \(3(2d + 7) = 39\)  
4. \(4(a - 2) = 3(a + 4)\)  
5. \(3(f + 2) + 9 = 13 + 5f\)  
6. \(2(x - 4) = 3(1 + x)\)  
7. \(2n + 5 = 4(n + 2) - n\)  
8. \(4(x + 3) = x\)  
9. \(2(c - 3) = 76\)  
10. \(7(x - 2) = 5(x + 2)\)  
11. \(2(6x + 1) = 4(x - 5) - 2\)  
12. \(4(2b - 6) + 11 = 8b - 13\)  
13. \(6 + 6(2t - 1) = 3 + 12t\)  
14. \(9t - 21 = 3(t - 7) + 6t\)

Solve. Graph each solution on a number line.

15. \(3x + 9 < 18\)  
16. \(5 + 2c < -9\)  
17. \(4x - 3 < 2 - x\)  
18. \(3(n + 2) < 24\)  
19. \(11 + 2b \leq 3(2 - b)\)  
20. \(\frac{m}{3} + 5 \geq 2\)  
21. \(\frac{1}{2} (8 - x) > 6\)  
22. \(\frac{c}{4} + 7 \geq 5\)  
23. \(y - 3 < 5y + 1\)  
24. \(20 - 2n > 26\)  
25. \(\frac{1}{3} (x - 6) < 2\)  
26. \(5 - 2k \leq 15\)  
27. \(-2(3 + t) < -8\)  
28. \(\frac{n}{4} - 9 > 5\)
Lesson 1 Skills Practice

Functions

Determine whether each relation is a function. Explain.

1. \{(3, −8), (3, 2), (6, −1), (2, 2)\}  
2. \{(0, 1), (−4, −3), (−3, 6), (3, 6)\}

3. \{(-6, 3), (2, −2), (0, 8), (1, 1)\}  
4. \{(1, 8), (−6, 21), (−11, 21), (−3, 11), (0, 21)\}

5. 
<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>−3</th>
<th>8</th>
<th>−8</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>11</td>
</tr>
</tbody>
</table>

6. 
<table>
<thead>
<tr>
<th>x</th>
<th>−1.2</th>
<th>1.1</th>
<th>1.7</th>
<th>−1.2</th>
<th>1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>2.8</td>
<td>2.3</td>
<td>−2.4</td>
<td>2.3</td>
<td>2.6</td>
</tr>
</tbody>
</table>

7. 

8. 

If \(f(x) = 4x - 2\), find each function value.

9. \(f(3)\)  
10. \(f(9)\)  
11. \(f(1)\)  
12. \(f(4)\)

13. \(f(−2)\)  
14. \(f(−10)\)  
15. \(f(5)\)  
16. \(f(−8)\)

If \(g(x) = 3x + 6\), find each function value.

17. \(g(2)\)  
18. \(g(7)\)  
19. \(g(−4)\)  
20. \(g(0)\)

21. \(g(−6)\)  
22. \(g(−1)\)  
23. \(g(9)\)  
24. \(g(12)\)
Lesson 2 Skills Practice

Representing Linear Functions

Find four solutions of each equation. Write the solutions as ordered pairs.

1. \(y = 8x - 4\)  
2. \(y = -x + 12\)  
3. \(4x - 4y = 24\)

4. \(x - y = -15\)  
5. \(y = 7x - 6\)  
6. \(y = -3x + 8\)

7. \(y = 12\)  
8. \(4x - 2y = 0\)  
9. \(4x - y = 4\)

Graph each equation by plotting ordered pairs.

10. \(y = 3x - 2\)  
11. \(x + y = 3\)  
12. \(y = -\frac{1}{2}x + \frac{3}{2}\)

13. \(y = -2x - 5\)  
14. \(y = 4x - 8\)  
15. \(y = \frac{2}{3}x - 2\)

16. \(y = -5x\)  
17. \(2x + y = 6\)  
18. \(y = 5x + 1\)
Lesson 3 Skills Practice

Constant Rate of Change and Slope

Find the constant rate of change for each linear function and interpret its meaning.

1. | Gallons | Quarts |
   | x      | y      |
   | 1      | 4      |
   | 2      | 8      |
   | 3      | 12     |
   | 4      | 16     |

2. Allowance

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Allowance ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>15</td>
<td>60</td>
</tr>
<tr>
<td>18</td>
<td>72</td>
</tr>
</tbody>
</table>

Find the slope of the line that passes through each pair of points.

5. A(1, -5), B(6, -7)

6. C(7, -3), D(8, 1)

7. E(7, 2), F(12, 6)

8. G(8, -3), H(11, -2)

9. J(5, -9), K(0, -12)

10. L(-4, 6), M(5, 3)

11. P(2, -2), Q(7, -1)

12. R(-5, -2), S(-5, 3)

13. T(5, -6), U(8, -12)

14. P(10, -2), Q(3, -1)

15. R(6, -5), S(7, 3)

16. T(1, 8), U(7, 8)
Lesson 4 Skills Practice

Direct Variation

Determine if the relationship between the two quantities is a direct variation. Explain your reasoning.

1. Pints Cups
<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

2. Plumbing Charges
   ![Graph showing cost as a function of time]

3. Movie Tickets
   ![Graph showing cost as a function of tickets]

4. Width (ft) Height (in.)
<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
</tr>
</tbody>
</table>

For each equation, determine if there is a constant of variation. If so, explain what it represents.

5. The equation \( y = 9.50x \) represents the number of dollars \( y \) Marty paid for \( x \) movie tickets.

6. The equation \( y = 0.10x + 45 \) represents the cost \( y \) of a cell phone plan when \( x \) text messages are sent and received.

7. The equation \( y = 24x \) represents the number of bottles of water \( y \) in \( x \) packages.
Lesson 5 Skills Practice

Slope-Intercept Form

State the slope and the y-intercept of the graph of each equation.

1. \( y = 12x - 4 \)
2. \( y = \frac{1}{4}x + 3 \)
3. \( 3x - y = 6 \)

4. \( y = -2x - 1 \)
5. \( y = -x + 4 \)
6. \( -3x = y + 1 \)

Graph each equation using the slope and y-intercept.

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

10. \( y = 5x - 1 \)
11. \( y = \frac{1}{2}x + 2 \)
12. \( y = -x + 2 \)

13. \( y = 2x + 2 \)
14. \( y = -4x + 2 \)
15. \( y = x - 3 \)
Lesson 6 Skills Practice

Solve Systems of Equations by Graphing

Solve each system of equations by graphing.

1. \(y = x - 9\)
   \(y = 2x + 4\)

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

3. \(\frac{1}{2}y = 4x - 6\)
   \(\frac{1}{4}y = 2x - 3\)

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

5. \(y = -5x - 8\)
   \(y = 2x - 1\)

6. \(y - \frac{1}{2}x = -1\)
   \(2y = x + 8\)
Lesson 7 Skills Practice

Solve Systems of Equations Algebraically

Solve each system of equations by substitution.

1. \( y = 3x - 7 \)
   \( y = -4x - 14 \)

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

3. \( y = 9x - 17 \)
   \( y = -5x + 11 \)

4. \( y = -8x + 13 \)
   \( y = x - 14 \)

5. \( y = x - 8 \)
   \( y = 1 \)

6. \( y = x + 4 \)
   \( y = 0 \)

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

8. \( y = 11 - x \)
   \( y = -2 \)

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

10. \( y = 2x \)
    \( x = -4 \)

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

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

13. \( 16 = 4x - y \)
    \( y = 2x \)

14. \( 26 = y + x \)
    \( y = x \)

15. \( y = 2x + 7 \)
    \( y = -3x - 23 \)

16. \( y + 2 = 6x \)
    \( y = 12x - 20 \)

17. \( y - x = -4 \)
    \( y = 2x - 9 \)

18. \( y = -6x + 18 \)
    \( y = 4x - 12 \)

19. \( y = -3x - 1 \)
    \( y = 4x + 6 \)

20. \( y = 9x + 5 \)
    \( y - 1 = 7x \)

21. \( y = -8x - 10 \)
    \( y = 3x + 23 \)

22. \( 4y = 3x + 6 \)
    \( 2y = x + 8 \)

23. \( y = 4x - 11 \)
    \( y = 2x + 1 \)

24. \( y = 11x + 7 \)
    \( y = 4x - 7 \)

25. \( y = 9x - 4 \)
    \( y = 12x + 2 \)

26. \( y + 4x = -3 \)
    \( y + 3 = 14x \)

27. \( y + 7 = 2x \)
    \( 2y = 4x - 14 \)

28. \( y = x + 1 \)
    \( y = 7x + 13 \)

29. \( y - 6x = 12 \)
    \( y = 6x + 5 \)

30. \( y = 5x + 18 \)
    \( y = 3x + 10 \)
Lesson 1 Skills Practice

Measures of Center

Find the mean, median, and mode for each set of data. If necessary, round to the nearest tenth.

1. 6, 3, 3, 12, 13, 15, 7
2. 1, 1, 0, 2, 1, 1, 0, 1

3. 202, 195, 219, 220
4. 2.5, 4.0, 8.7, 3.3, 3.3, 5.2

5. 21, 23, 39, 44, 27, 25, 28, 30
6. 87, 85, 87, 87, 87

Find the mean, median, and mode for each set of data. If necessary, round to the nearest tenth.

7. [Data representation]
8. [Data representation]

9. The average daily temperature by month for one year in Denver, Colorado, is given in the table below. Find the mean, median, and mode for temperature. If necessary, round to the nearest tenth.

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (°F)</td>
<td>43°</td>
<td>47°</td>
<td>51°</td>
<td>61°</td>
<td>71°</td>
<td>82°</td>
<td>88°</td>
<td>86°</td>
<td>78°</td>
<td>67°</td>
<td>52°</td>
<td>46°</td>
</tr>
</tbody>
</table>

10. The following set of data shows the number of canned goods collected by each grade at Del Cerro Elementary. Which measure of center best represents the data? Justify your selection and then find the measure of center.

316, 305, 111, 295, 325, 322
Lesson 2 Skills Practice

Measures of Variability

Find the measures of variability and any outliers for each set of data.

1. {7, 9, 21, 8, 13, 19}  
2. {33, 34, 27, 40, 38, 35}

3. {37, 29, 42, 33, 31, 36, 40}  
4. {87, 72, 104, 94, 85, 71, 80, 98}

5. {92, 89, 124, 114, 98, 115, 106, 101, 149}  
6. {6.7, 3.4, 3.8, 4.2, 5.1, 5.8, 6.0, 4.5}

7. {4.3, 1.9, 6.3, 5.1, 2.1, 1.6, 2.4, 5.6, 5.9, 3.5}  
8. {127, 58, 49, 101, 104, 98, 189, 111}

9. **Ages of People at Movie**

<table>
<thead>
<tr>
<th>Ages</th>
<th>10</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

10. **Points Scored by Lions Basketball Team**

<table>
<thead>
<tr>
<th>Points</th>
<th>78</th>
<th>79</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>96</td>
<td></td>
</tr>
</tbody>
</table>

11. **Costs of Items at Store ($)**

<table>
<thead>
<tr>
<th>Costs</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

For Exercises 12–15, use the data in the table showing the calories burned by a 125-pound person.

12. Which activity burns the most calories per hour? The least calories per hour?

13. What is the range of the data?

14. What is the interquartile range of the data?

15. Are there any outliers?

**Estimated Calories Burned**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Calories Burned per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>480</td>
</tr>
<tr>
<td>Bicycling</td>
<td>600</td>
</tr>
<tr>
<td>Hiking</td>
<td>360</td>
</tr>
<tr>
<td>Mowing the Lawn</td>
<td>270</td>
</tr>
<tr>
<td>Running</td>
<td>660</td>
</tr>
<tr>
<td>Soccer</td>
<td>420</td>
</tr>
<tr>
<td>Swimming</td>
<td>600</td>
</tr>
<tr>
<td>Weight Training</td>
<td>360</td>
</tr>
<tr>
<td>Yoga</td>
<td>240</td>
</tr>
</tbody>
</table>
Lesson 3 Skills Practice

Mean Absolute Deviation

Find the mean and the mean absolute deviation of each data set.

1. 8 9 7 3 5
2. 6 3 12 7 9 10 9 2 0 1
3. 5 0 −2 4.5 6
4. 2.1 4.3 −9.2 16
5. 12 11 10 9 8 7 6 5
6. −4 −7 −1 0
7. 9 0 9 0
8. 18 12 14 28 19 11

9. The heights, in inches, of nine third-graders are shown below. Find the mean absolute deviation to the nearest tenth. Describe what the mean absolute deviation represents.
   41 48 45 56 61 50 55 51 54

10. The depths, in meters, of five divers are shown in the table. Find the mean absolute deviation (rounded to the nearest tenth). Describe what the mean absolute deviation represents.

   | Diving Depths |
   | 0  -1.5  -3  -4.5  -6 |

11. The last three scores of Kelsey’s bowling games are 119, 111, and 106. Find the mean absolute deviation to the nearest whole number. Describe what the mean absolute deviation represents.

12. The weights, in pounds, of four vehicles are shown below. Find the mean absolute deviation. Describe what the mean absolute deviation represents.

   | Vehicle Weights |
   | 1025  2000  1908  1540 |
Lesson 4 Skills Practice

Compare Populations

1. The double box plot shows the heights in inches for the players on two basketball teams. Compare their centers and variability. Write an inference you can draw about the two populations.

![Height of Players (in.)](image)

2. The double dot plot shows the number of minutes two students spent practicing the piano. Compare their centers and variability. Round to the nearest tenth. Write an inference you can draw about the two populations.

![Minutes Spent Practicing](image)

3. The double box plot shows the daily number of customers for two ice cream parlors. Compare the centers and variability of the two populations. Which ice cream parlor has the greater number of daily customers?

![Number of Daily Customers](image)
Lesson 5 Skills Practice

**Using Sampling to Predict**

Identify each sample as **biased** or **unbiased** and describe its type. Explain your reasoning.

1. To determine how many students have pets, all students in one classroom are surveyed.

2. To determine the number of students who plan on attending the Valentine’s Day dance, 20 students are randomly selected from each grade level.

3. To determine whether customers are satisfied with their meals, a restaurant collects comment cards that are voluntarily filled out by customers.

4. To determine the most popular color of car, the color of every 12th car that crosses an intersection is recorded.

5. To determine the most popular major league baseball team among its readers, a sports magazine polled by telephone a random selection of its readers.

6. The student council would like to sell pizza slices during home basketball games as a fundraiser. During a home game with 250 people in attendance, they surveyed every 10th spectator to enter the gym about their favorite pizza toppings. Their results are shown in the table. Is this sampling method valid? If so, how many pepperoni pizzas should be ordered if they order 25 pizzas? Explain your reasoning.

<table>
<thead>
<tr>
<th>Topping</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pepperoni</td>
<td>10</td>
</tr>
<tr>
<td>Veggies</td>
<td>8</td>
</tr>
<tr>
<td>Cheese</td>
<td>7</td>
</tr>
</tbody>
</table>
Lesson 6 Skills Practice

Probability of Simple Events

A spinner like the one shown is used in a game. Determine the probability of each outcome if the spinner is equally likely to land on each section. Express each probability as a fraction and as a percent. Then describe the likelihood of the event. Write impossible, unlikely, equally likely, likely, or certain.

1. \( P(10) \) 
2. \( P(\text{odd}) \)

3. \( P(\text{greater than 7}) \) 
4. \( P(\text{prime}) \) 
5. \( P(1 \text{ or } 2) \)

6. \( P(\text{less than 5}) \) 
7. \( P(\text{shaded}) \) 
8. \( P(\text{not shaded}) \)

A bag contains 6 red, 3 blue, 15 green, and 6 yellow marbles. A marble is selected without looking. Determine the probability of each outcome if it is equally likely to select each marble. Express each probability as a fraction and as a percent. Then describe the likelihood of the event. Write impossible, unlikely, equally likely, likely, or certain.

9. \( P(\text{blue}) \) 
10. \( P(\text{red}) \) 
11. \( P(\text{green}) \)

12. \( P(\text{not yellow}) \) 
13. \( P(\text{not green}) \) 
14. \( P(\text{black}) \)

15. \( P(\text{not blue}) \) 
16. \( P(\text{not red}) \) 
17. \( P(\text{red, blue, green, or yellow}) \)

A bag contains some tiles. Each tile has the number 1, 10, 100, or 1000 written on it. The table shows the frequency of each number in the bag. You choose a tile at random. Determine the probability of each outcome if it is equally likely to select each tile. Express each probability as a fraction and as a percent. Then describe the likelihood of the event. Write impossible, unlikely, equally likely, likely, or certain.

<table>
<thead>
<tr>
<th>Number</th>
<th>1</th>
<th>10</th>
<th>100</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>22</td>
<td>16</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

18. \( P(10) \) 
19. \( P(\text{not 100}) \) 
20. \( P(1000) \)

21. \( P(\text{even}) \) 
22. \( P(\text{not 1000}) \) 
23. \( P(\text{not even}) \)
Lesson 7 Skills Practice

Theoretical and Experimental Probability

The table shows the results of an experiment in which a spinner was spun 50 times. Find the experimental probability of each outcome.

<table>
<thead>
<tr>
<th>Number</th>
<th>Frequency</th>
<th>Number</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td>4</td>
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<td>8</td>
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</tbody>
</table>

The table shows the results of a survey that asked 300 teens, ages 15–18, what their first choice would be in selecting a high school elective for their schedule. Out of a similar group of 500 teens, predict how many would choose the following.

7. How many would choose Cooking 101 as their favorite elective?

8. How many would choose Band as their favorite elective?

9. How many would choose Robotics as their favorite elective?

10. How many more teens would prefer Art to Computer Science?

Of two hundred adults surveyed, 85 said that they were planning to go on vacation over spring break.

11. What is the experimental probability that an adult was planning on going on vacation over spring break?

12. Suppose 250 adults were surveyed. How many would be expected to go on vacation over spring break?

13. A coin is tossed 30 times, and it comes up heads 18 times. Find the experimental probability of tossing heads for this experiment. Then compare the experimental probability with the theoretical probability.
Lesson 8 Skills Practice

Probability of Compound Events

Draw a tree diagram to find the number of outcomes for each situation.

1. Three coins are tossed.
2. A number cube is rolled and a coin is tossed.

Find the total number of outcomes in each situation.

3. One card is drawn from a standard deck of cards.
4. Three six-sided number cubes are rolled.
5. One coin is flipped three consecutive times.
6. One coin is flipped and one eight-sided die is rolled.
7. A sweater comes in 3 sizes and 6 colors.
8. A restaurant offers dinners with a choice each of two salads, six entrees, and five desserts.

Find each probability.

9. Draw the ace of spades from a standard deck of cards.
10. A coin is tossed twice. What is the probability of getting two tails?
11. Draw the six of clubs from a standard deck of cards.
12. Roll a 4 or higher on a six-sided number cube.
13. Roll a 7 or an 8 on an eight-sided die.
14. Roll an even number on an eight-sided die.
15. Draw a club from a standard deck of cards.
16. Roll an odd number on a six-sided number cube.
17. A coin is tossed and an eight-sided die is rolled. What is the probability that the coin lands on tails, and the die lands on a 2?
18. A coin is tossed and a card is drawn from a standard deck of cards. What is the probability of landing on tails and choosing a red card?

Math Accelerated • Chapter 10 Statistics and Probability
Lesson 1 Skills Practice

Angle and Line Relationships

In the figure at the right, \(c \parallel d\) and \(p\) is a transversal. If \(m\angle 5 = 110^\circ\), find the measure of each angle.

1. \(\angle 6\)  
2. \(\angle 8\)  
3. \(\angle 2\)  
4. \(\angle 4\)

In the figure at the right, \(g \parallel k\) and \(r\) is a transversal. If \(m\angle 7 = 60^\circ\), find the measure of each angle.

5. \(\angle 4\)  
6. \(\angle 6\)  
7. \(\angle 5\)  
8. \(\angle 3\)

Classify the pairs of angles shown. Then find the value of \(x\) in each figure.

9. \(120^\circ x^\circ\)
10. \(119^\circ x^\circ\)
11. \(55^\circ x^\circ\)
12. \(40^\circ x^\circ\)
13. \(80^\circ x^\circ\)
14. \(98^\circ x^\circ\)
15. \(22^\circ x^\circ\)
16. \(59^\circ x^\circ\)
17. \(x^\circ 6^\circ\)
18. \(89^\circ x^\circ\)
19. \(x^\circ 44^\circ\)
20. \(105^\circ x^\circ\)
Lesson 2 Skills Practice

Triangles

Find the value of $x$ in each triangle. Then classify each triangle by its angles and by its sides.

1. $x^\circ$
   
   $58^\circ$ $73^\circ$

2. $x^\circ$
   
   $45^\circ$ $45^\circ$

3. $x^\circ$
   
   $107^\circ$ $36^\circ$

4. $x^\circ$
   
   $60^\circ$ $60^\circ$

5. $x^\circ$
   
   $40^\circ$ $85^\circ$

6. $x^\circ$
   
   $48^\circ$ $75^\circ$

7. $x^\circ$
   
   $82^\circ$ $24^\circ$

8. $(x + 5)^\circ$
   
   $90^\circ$ $155^\circ$

Classify each dashed triangle by its angles and by its sides.

9. 

10. $47^\circ$ $47^\circ$

11. $35^\circ$ $25^\circ$
Lesson 3 Skills Practice

Polygons

Determine whether the figure is a polygon. If it is, classify the polygon. If it is not a polygon, explain why.

1. [Diagram of a figure]
2. [Diagram of an octagon]
3. [Diagram of a square]
4. [Diagram of a circle]
5. [Diagram of a hexagon]
6. [Diagram of a hexagon]

Find the sum of the measures of the interior angles of each polygon.
7. pentagon
8. 20-gon
9. nonagon
10. decagon

Find the measure of one interior angle in each regular polygon. Round to the nearest tenth if necessary.
11. hexagon
12. heptagon
13. quadrilateral
14. octagon
15. pentagon
16. 100-gon

Identify the polygons used to create each tessellation.
17. [Diagram of tessellation]
18. [Diagram of tessellation]
Lesson 4 Skills Practice

Translations and Reflections on the Coordinate Plane

For Exercises 1 and 2, use the coordinate plane below. Triangle $PQR$ is shown.

1. Find the coordinates of the vertices of the image of $\triangle PQR$ translated 3 units to the left and 4 units down.

2. Find the coordinates of the vertices of the image of $\triangle PQR$ translated 2 units to the right and 5 units down.

For Exercises 3 and 4, use the coordinate plane below. Figure $ABCD$ is shown.

3. Find the coordinates of the vertices of the image of figure $ABCD$ translated 1 unit to the right and 6 units down.

4. Find the coordinates of the vertices of the image of figure $ABCD$ translated 4 units to the left and 2 units up.

5. The vertices of figure $HJKL$ are $H(3, 1), J(5, -2), K(1, -4),$ and $L(1, 0)$. Graph the figure and its image after a reflection over the $y$-axis.

6. The vertices of figure $STUV$ are $S(-3, 2), T(-2, 4), U(3, 3),$ and $V(2, 1)$. Graph the figure and its image after a reflection over the $x$-axis.
Lesson 5 Skills Practice

Rotations on the Coordinate Plane

Draw each figure after the rotation described.

1. 90° clockwise rotation about point B

![Drawing of rotated star]

2. 180° clockwise rotation about point C

![Drawing of rotated figure]

3. A figure has vertices A(1, 1), B(1, 3), C(3, 3), and D(4, 1). Graph the figure and its image after a rotation of 90° clockwise about the origin.

![Graph of figure and its image]

Determine whether each figure has rotational symmetry. If it does, describe the angle of rotation.

4. Z

![Drawing of rotated Z]

5. 

![Drawing of rotated triangle]

6. 

![Drawing of rotated trapezoid]

7. 

![Drawing of rotated hexagon]
Lesson 6 Skills Practice

Congruence and Transformations

Determine if the two figures are congruent by using transformations. Explain your reasoning.

1. \(\triangle EFG\) and \(\triangle JKL\)

2. \(\triangle SUT\) and \(\triangle WXY\)

3. \(\triangle TUV\) and \(\triangle WXW\)

4. \(\triangle ABD\) and \(\parallel \text{gram}\)

5. \(\text{pentagon} CDHG\) and \(\text{pentagon} NOPR\)

6. \(\text{trapezoids} QRS\) and \(\text{trapezoids} MNO\)

Math Accelerated • Chapter 11 Congruence, Similarity, and Transformations
Lesson 7 Skills Practice

Dilations on the Coordinate Plane

Find the vertices of each figure after a dilation with the given scale factor \( k \). Then graph the image.

1. \( k = 2 \)

2. \( k = 3 \)

3. \( k = \frac{1}{2} \)

4. \( k = \frac{1}{4} \)

5. Find the vertices of figure \( WXYZ \) after a dilation with a scale factor of \( \frac{1}{3} \) if it has vertices \( W(-3, 6) \), \( X(3, -3) \), \( Y(-3, -6) \), and \( Z(-6, -3) \). Then graph the image.

6. Find the scale factor for the dilation shown at the right.
Lesson 8 Skills Practice

Similarity and Transformations

Determine if the two figures are similar by using transformations. Explain your reasoning.

1. 

2. 

3. 

4. 

Math Accelerated • Chapter 11 Congruence, Similarity, and Transformations
Lesson 1 Skills Practice

Circles and Circumference

Find the circumference of each circle. Round to the nearest tenth.

1. \[ \text{9 m} \]
2. \[ \text{17 ft} \]
3. \[ \text{3 yd} \]
4. \[ \text{5 cm} \]
5. radius = 7 kilometers
6. diameter = 20 centimeters
7. diameter = 8.5 meters
8. radius = 11 yards
9. diameter = \(6 \frac{2}{5} \text{ feet}\)
10. radius = 25 inches

Match each circle described in the column on the left with its corresponding circumference in the column on the right.

11. diameter = 6 units a. 18.8 units
12. radius = 9 units b. 40.8 units
13. diameter = 13 units c. 15.7 units
14. radius = 2.5 units d. 56.5 units

15. A basketball goal is 18 inches in diameter. A basketball has a diameter of about 9.6 inches. What is the difference in circumference between the goal and the center cross-section of a basketball?

16. The Navajo and Pueblo Indians create large, circular sand paintings as part of traditional healing ceremonies. How much more circumference does a sand painting with a 20-foot diameter have compared with one with a 5-foot diameter?

17. In bowling, the distance from the foul line to the headpin is 60 feet. A bowling ball has a radius of about 4.3 inches. How many times must the ball rotate in order to strike the headpin?

18. You want to install a 1 yard wide walk around a circular swimming pool. The diameter of the pool is 20 yards. What is the distance around the outside edge of the walkway?

19. The standard trampoline has a circumference of about 41 feet. When Jenna’s dad lays with his feet at the center of the trampoline, the top of his head aligns with the outer edge. About how tall is Jenna’s dad?
Lesson 2 Skills Practice

Area of Circles

Find the area of each circle. Round to the nearest tenth.

1. \(5 \text{ cm}\) 
2. \(24 \text{ m}\)

3. \(20 \text{ ft}\) 
4. \(8 \text{ in.}\)

5. \(6 \text{ yd}\) 
6. \(18 \text{ mi}\)

7. radius = 6 kilometers 
8. diameter = 14 inches

9. diameter = 6 yards 
10. radius = 5 feet

11. radius = 18 centimeters 
12. diameter = 8.4 meters

13. The top of a cap on a bottle of juice has a diameter of 38 mm. What is the area of the top of the cap on the bottle of juice? Round to the nearest tenth.

14. A DVD has a radius of 6.1 centimeters. What is the area of the DVD? Round to the nearest tenth.

15. The cover for a circular swimming pool has a diameter of 8 meters. What is the area of the cover? Round to the nearest tenth.

16. A circular flower garden has a radius of 5 feet. Emma wants to put mulch in the flower garden. It costs $0.35 per square foot of mulch. How much will Emma spend to put mulch in the flower garden? Round to the nearest cent.
Lesson 3 Skills Practice

Area of Composite Figures

Find the area of each figure. Round to the nearest tenth if necessary.

1. \[
\begin{array}{c}
\text{3 mi} \\
\text{2 mi} \\
\text{6 mi} \\
\text{4 mi} \\
\text{2 mi} \\
\text{10 mi} \\
\end{array}
\]

2. \[
\begin{array}{c}
\text{5 mm} \\
\text{20 mm} \\
\text{9 mm} \\
\text{20 mm} \\
\text{3 mm} \\
\text{9 mm} \\
\end{array}
\]

3. \[
\begin{array}{c}
\text{5 ft} \\
\text{3 ft} \\
\text{6 yd} \\
\text{11 ft} \\
\text{5 ft} \\
\end{array}
\]

4. \[
\begin{array}{c}
\text{8 m} \\
\text{20 m} \\
\end{array}
\]

5. \[
\begin{array}{c}
\text{2 in.} \\
\text{4 in.} \\
\text{5 in.} \\
\end{array}
\]

6. \[
\begin{array}{c}
\text{10 cm} \\
\text{10 cm} \\
\text{10 cm} \\
\text{7 cm} \\
\text{5 cm} \\
\end{array}
\]

7. \[
\begin{array}{c}
\text{9 yd} \\
\text{6 yd} \\
\text{5 yd} \\
\end{array}
\]

8. \[
\begin{array}{c}
\text{5 m} \\
\text{11 m} \\
\text{10 m} \\
\text{9 m} \\
\text{4 m} \\
\end{array}
\]

9. \[
\begin{array}{c}
\text{8 ft} \\
\text{10 ft} \\
\text{9 m} \\
\text{2 m} \\
\text{6 m} \\
\end{array}
\]

Find the area of each shaded area. Round to the nearest tenth, if necessary. 
(Hint: Find the total area and subtract the non-shaded area.)

10. \[
\begin{array}{c}
\text{6 in.} \\
\text{12 in.} \\
\text{5 in.} \\
\end{array}
\]

11. \[
\begin{array}{c}
\text{12 yd} \\
\text{3 yd} \\
\text{3 yd} \\
\end{array}
\]

12. \[
\begin{array}{c}
\text{10 m} \\
\text{9 m} \\
\text{2 m} \\
\text{6 m} \\
\end{array}
\]
Lesson 4 Skills Practice

Three-Dimensional Figures

Identify each figure. Name the bases, faces, edges, and vertices.

1. 

2. 

3. 

4. 

Draw and describe the shape resulting from each cross section.

5. 

6. 

7. 

8.
Lesson 5 Skills Practice

**Volume of Prisms**

Find the volume of each figure.

1.  
   - Length: 7 ft
   - Width: 4 ft
   - Height: 11 ft

2.  
   - Base: 41 m
   - Height: 28 m

3.  
   - Length: 27 yd
   - Width: 8 yd

4.  
   - Base: 4 cm
   - Height: 15 cm
   - Side: 8 cm

5.  
   - Length: 6 ft
   - Width: 12.5 ft
   - Height: 5 ft

6.  
   - Base: 5 in.
   - Height: 4 in.
   - Other side: 8 in.

7.  rectangular prism: length 18 feet, width 9 feet, height 1 foot

8.  triangular prism: base of triangle 22 yards, height of triangle 14 yards, height of prism 30 yards

9.  Find the width of a rectangular prism with a length of 11.5 inches, a height of 14 inches, and a volume of 483 cubic inches.

10. The blueprints for a barn are shown at the right. What is the volume of the barn?

11. The artist that created the sculpture shown needs to pack it for shipping. What is the volume of the sculpture?
Lesson 6 Skills Practice

Volume of Cylinders

Find the volume of each cylinder. Round to the nearest tenth.

1. [Diagram of a cylinder with a radius of 5 in. and a height of 10 in.]

2. [Diagram of a cylinder with a radius of 24 mm and a height of 15 mm]

3. [Diagram of a cylinder with a radius of 10 cm and a height of 5 cm]

4. radius: 12.4 m
   height: 5.2 m

5. radius: 5.5 ft
   height: 14 ft

6. diameter: 12.5 in.
   height: 16.25 in.

Find the height of each cylinder. Round to the nearest tenth.

7. Volume: 1494.1 m$^3$
   height: 6.7 m

8. Volume: 1073.9 ft$^3$
   height: 12 ft

9. Volume: 31.2 m$^3$
   height: 2.35 m

10. radius: 4.6 cm
    volume: 850.5 cm$^3$

11. radius: 17 ft
    volume: 1361.2 ft$^3$

12. diameter: 32 yd
    volume: 3215.4 yd$^3$

Find the volume of each figure. Round to the nearest tenth.

13. [Diagram of a figure with dimensions: 1.5 in. radius, 12 in. height, 10 in. radius, 8 in. height, 2.5 in. radius, 15 in. height, 4 in. radius, 4 in. height]

14. [Diagram of a figure with dimensions: 4.5 in. radius, 2 in. height, 1.5 in. radius, 2 in. height, 1.5 in. radius, 2 in. height, 1.5 in. radius, 2 in. height]

15. [Diagram of a figure with dimensions: 12 cm radius, 7 cm height, 20 cm width, 15 cm depth]

16. [Diagram of three cylinders with dimensions: 8 cm radius, 10 cm height, 4 cm radius, 8 cm height]

17. [Diagram of a figure with dimensions: 4 ft radius, 1 ft height, 2 ft width, 2 ft depth]

18. [Diagram of a figure with dimensions: 2.5 yd radius, 2 yd height, 3 yd length, 10 yd width]
Lesson 7 Skills Practice

Volume of Pyramids, Cones, and Spheres

Find the volume of each figure. Round to the nearest tenth, if necessary.

1. \[ \text{Sphere: radius 4 ft} \]

2. \[ \text{Triangular pyramid: base sides 7.5 m, height 16 m} \]

3. \[ \text{Cone: radius 7.5 m, height 4.5 in.} \]

4. \[ \text{Triangular pyramid: base sides 7 yd, height 7 yd} \]

5. \[ \text{Triangular pyramid: base sides 12 ft, height 5 ft} \]

6. \[ \text{Sphere: radius 15 in.} \]

7. \[ \text{Triangular pyramid: base sides 23 ft, height 20 ft} \]

8. \[ \text{Sphere: radius 5 mm} \]

9. \[ \text{Cone: radius 14 cm, height 15 cm} \]

10. Rectangular pyramid: length 7 feet, width 2.5 feet, height 8 feet

11. Cone: radius 20 centimeters, height 30 centimeters

12. Sphere: radius 2 inches
Lesson 8 Skills Practice

Surface Area of Prisms

Find the lateral and surface area of each prism.

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. rectangular prism: length 17 yards, width 4.5 yards, height 3 yards

11. rectangular prism: length 16 feet, width 12 feet, height 42 feet

12. rectangular prism: length 20.2 centimeters, width 10 centimeters, height 43 centimeters
Lesson 9 Skills Practice

Surface Area of Cylinders

Find the lateral and surface area of each cylinder. Round to the nearest tenth.

1. \[ \text{radius} = 3.5 \text{ m}, \text{height} = 0.6 \text{ m} \]
2. \[ \text{radius} = 9 \text{ mm}, \text{height} = 6 \text{ mm} \]
3. \[ \text{radius} = 5 \text{ in.}, \text{height} = 18 \text{ in.} \]
4. \[ \text{radius} = 5.4 \text{ cm}, \text{height} = 24.5 \text{ cm} \]
5. \[ \text{radius} = 5 \frac{1}{4} \text{ ft}, \text{height} = 12 \frac{3}{4} \text{ ft} \]
6. \[ \text{radius} = 28 \text{ in.}, \text{height} = 2.5 \text{ in.} \]
7. \[ \text{radius} = 3.6 \text{ m}, \text{height} = 15 \text{ m} \]
8. \[ \text{radius} = 20 \text{ in.}, \text{height} = 84 \text{ in.} \]
9. \[ \text{radius} = 16.4 \text{ cm}, \text{height} = 35 \text{ cm} \]
10. \[ \text{radius} = 16 \text{ feet}, \text{height} = 12 \text{ feet} \]
11. \[ \text{diameter} = 20.2 \text{ cm}, \text{height} = 43 \text{ cm} \]
12. \[ \text{diameter} = 38.2 \text{ m}, \text{height} = 50 \text{ m} \]
Lesson 10 Skills Practice

Surface Area of Pyramids and Cones

Find the lateral and surface area of each figure. Round to the nearest tenth.

1. \[ \text{base side length } 12 \text{ m} \]
2. \[ \text{base side length } 12 \text{ ft} \]
3. \[ \text{base side length } 42 \text{ in.} \]
4. \[ \text{base side length } 2.9 \text{ ft} \]
5. \[ \text{base side length } 8.6 \text{ in.} \]
6. \[ \text{base side length } 30 \text{ cm} \]
7. \[ \text{base side length } 55 \text{ mm} \]
8. \[ \text{base side length } 18 \text{ in.} \]
9. \[ \text{base side length } 20 \text{ m} \]
10. square pyramid: base side length 6.3 meters, slant height 4 meters
11. cone: diameter 16 yards, slant height 10 yards
12. cone: radius 14 centimeters, slant height 33 centimeters