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### Practice

**Comparing and Ordering Whole Numbers**

**Compare. Write <, >, or =.**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>69</td>
<td>96</td>
<td></td>
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<tr>
<td>2.</td>
<td>117</td>
<td>107</td>
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<tr>
<td>3.</td>
<td>958</td>
<td>9,124</td>
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<tr>
<td>4.</td>
<td>3,567</td>
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<td>5.</td>
<td>18,443</td>
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<td>6.</td>
<td>64,209</td>
<td>64,290</td>
<td></td>
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</tbody>
</table>

Order the numbers from least to greatest.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>7.</td>
<td>58; 166; 85</td>
<td></td>
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<td>8.</td>
<td>115; 151; 111</td>
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<td>269; 29; 96</td>
<td></td>
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<tr>
<td>10.</td>
<td>308; 3,800; 3,080</td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>1,864; 824; 1,648</td>
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<tr>
<td>12.</td>
<td>4,663; 4,336; 43,666</td>
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Order the numbers from greatest to least.

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<td>13.</td>
<td>35; 53; 13</td>
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<td>15.</td>
<td>249; 392; 248</td>
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<td></td>
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<tr>
<td>16.</td>
<td>555; 600; 535</td>
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<tr>
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19. Delaware and Rhode Island are the two smallest states. Delaware covers 1,955 square miles, and Rhode Island covers 1,045 square miles. What is the smallest state in the United States?

20. Vermont and Wyoming have the smallest populations in the United States. The population of Vermont is 608,827. The population of Wyoming is 493,782. Which state has the smallest population?

---

Name ___________________________ Date _________ Class _________

### Lesson 1-1

**Comparing and Ordering Whole Numbers**

**Compare. Write <, >, or =.**

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LESSON 12
Estimating with Whole Numbers

Estimate each sum or difference.

1. 67 + 14
2. 583 − 329
3. 94 − 36
4. 2,856 + 2,207
5. 276 + 316
6. 6,020 − 3,688
7. 34,465 + 19,002
8. 78,135 − 19,431
9. 216,135 + 165,800

Estimate each product or quotient.

10. 59 × 6
11. 51 × 8
12. 83 ÷ 4
13. 9 × 27
14. 49 ÷ 6
15. 53 × 8
16. 147 ÷ 5
17. 118 ÷ 6
18. 79 × 5

19. Sailfish are the fastest fish in the world. They can swim 68 miles an hour. About how far can a sailfish swim in 3 hours?

20. At a height of 3,281 feet, Angel Falls in Venezuela is the tallest waterfall in the world. Niagara Falls in the United States is only 190 feet tall. About how much taller is Angel Falls?

21. Ali, a gardener, is preparing to fertilize a lawn. The lawn is 30 yards by 25 yards. One bag of fertilizer will cover an area of 100 square yards. How many bags of fertilizer does Ali need to buy?
Write each expression in exponential form.

1. $9 \times 9$
2. $7 \times 7 \times 7$
3. $1 \times 1 \times 1 \times 1$
4. $5 \times 5 \times 5 \times 5$
5. $2 \times 2 \times 2 \times 2 \times 2$
6. $10 \times 10 \times 10 \times 10$

Find each value.

7. $6^2$
8. $5^3$
9. $10^3$
10. $7^2$
11. $2^5$
12. $3^4$
13. $25^1$
14. $16^0$

Compare. Write $<$, $>$, or $=$.

15. $8^2 \quad 7^1$
16. $10^2 \quad 11^2$
17. $8^2 \quad 4^3$
18. $3^4 \quad 5^2$
19. $2^5 \quad 9^2$
20. $6^2 \quad 3^3$

21. What whole number equals 25 when it is squared and 125 when it is cubed?

22. Use exponents to write the number 81 three different ways.
Evaluate each expression.

1. \(10 \div 6 \times 2\)
2. \((15 + 39) \div 6\)
3. \((20 - 15) \times 2 + 1\)

4. \((4^2 + 6) \div 11\)
5. \(9 + (7 - 1) \times 2\)
6. \((2 \times 4) + 8 - (5 \times 3)\)

7. \(5 + 18 + 3^2 - 1\)
8. \(8 + 5 \times 10 - 12\)
9. \(14 + (50 - 7^2) \times 3\)

Add parentheses so that each equation is correct.

10. \(7 + 9 \times 3 - 1 = 25\)
11. \(2^3 - 7 \times 4 = 4\)
12. \(5 + 6 \times 9 + 3 = 23\)

13. \(12 \div 3 \times 2 = 2\)
14. \(8 + 3 \times 6 - 4 - 1 = 13\)
15. \(4 \times 3^2 + 1 = 40\)

16. \(9 \times 0 + 5 - 3 = 42\)
17. \(15 \times 3^2 - 2^3 = 15\)
18. \(14 + 2 + 5 \times 5 = 10\)

19. Tyler walked 2 miles a day for the first week of his exercise plan. Then he walked 3 miles a day for the next 9 days. How many miles did Tyler walk in all?

20. Paulo’s father bought 8 pizzas and 12 bottles of juice for the class party. Each pizza cost $9 and each bottle of juice cost $2. Paulo’s father paid with a $100-bill. How much change did he get back?
Practice
Mental Math

Evaluate.
1. \(17 + 4 \times 5\)  
2. \(25 \times 3 \times 4\)  
3. \(28 + 39 + 11 + 22\)  
4. \(12 + 7 + 8 + 13\)  
5. \(10 + 3 \times 2\)  
6. \(9 \times 8 \times 5\)
7. \(97 + 4 + 3 + 26\)  
8. \(2 \times 6 \times 5\)  
9. \(28 + 2 \times 6\)

Use the Distributive Property to find each product.
10. \(4 \times 16\)  
11. \(8 \times 31\)  
12. \(3 \times 62\)  
13. \(2 \times 46\)
14. \(5 \times 29\)  
15. \(7 \times 22\)  
16. \(9 \times 21\)  
17. \(6 \times 15\)
18. \(8 \times 44\)  
19. \(4 \times 29\)  
20. \(7 \times 31\)  
21. \(5 \times 57\)

22. Each ticket to a play costs $27. How much will it cost to buy 4 tickets? Which property did you use to solve this problem with mental math?

23. Mr. Stanley bought two cases of pencils. Each case has 20 boxes. In each box there is 10 pencils. Use mental math to find how many pencils Mr. Stanley bought.

24. When you consider that cows eat grass and the water needed to grow the grass that cows eat, it takes 65 gallons of water to produce one serving of milk! Use mental math to find how many gallons of water are needed to produce 5 servings of milk.
1. Athletes from 197 countries competed at the 1996 Summer Olympic Games held in Atlanta, Georgia. That is 25 more countries that competed at the 1992 games held in Barcelona, Spain. How many different countries competed in Barcelona?

2. At the 1996 Summer Olympic Games held in Atlanta, Georgia, 10,310 athletes competed. At the 1992 Summer Olympic Games held in Barcelona, Spain, 9,364 athletes competed. How many more athletes competed in Atlanta than in Barcelona?

3. The marathon race is one of the oldest events in the Summer Olympic Games. Marathon competitors run a total of 26 miles 385 yards. There are 5,280 feet in a mile and 3 feet in a yard. How many yards long is the entire marathon race?

4. The world record for the fastest men’s marathon race is 2 hours, 5 minutes, 42 seconds. The world record for the fastest women’s marathon race is 2 hours, 20 minutes, 43 seconds. How much faster is the men’s record marathon time?

5. The men’s outdoor world record in the high jump is 2.45 meters or 8 feet 0.5 inches. The women’s outdoor world record in the high jump is 2.09 meters or 6 feet 10.25 inches. How much higher is the men’s high jump record? Write the answer in meters and feet.

6. The men’s world record in the 400-meter relay is 37.40 seconds, held by the U.S. If each of the four runners each ran 100 meters in the same time, how long did each runner run?

7. Athletes from 13 nations competed in the first modern Olympics in 1896. Today, athletes from nearly 200 nations compete in the Summer Olympics. About how many more nations participate in the Olympics today than in 1896?
Identify a pattern in each arithmetic sequence and then find the missing terms.

1. 4, 8, 16, 32, □, □, □, …

2. 100, 95, 90, 85, □, □, □, …

3. 8, 20, 32, 44, □, □, □, …

4. 6, 12, 18, 24, □, □, □, …

5. 9, 18, 27, 36, □, □, □, …

6. 3, 6, 12, 24, □, □, □, …

7. 8. 300, 250, □, □, 100, □, 0, …

9. 1, 15, □, 43, 57, □, 85, 99, …

10. 7, □, 21, 28, □, □, □, 56, …

11. 9, □, 13, □, □, □, 21, 23, …

12. 13. A forest ranger in Australia took measurements of a eucalyptus tree for the past 3 weeks. The tree was 12 inches tall the first week, 19 inches the second week, and 26 inches the third week. If this growth pattern continues, how tall will the tree be next week?

14. Maria puts the same amount of money in her savings account each month. She had $450 in the account in April, $600 in May, and $750 in June. If she continues her savings pattern, how much money will she have in the account in July?
Name ___________________________ Date __________ Class __________

**Practice**

**2-1 Variables and Expressions**

Evaluate each expression to find the missing values in the tables.

1. \[
\begin{array}{c|c}
\hline
n & n + 8^2 \\
7 & 71 \\
9 & \\
22 & \\
35 & \\
\hline
\end{array}
\]

2. \[
\begin{array}{c|c}
\hline
n & 25 - n \\
20 & 5 \\
5 & \\
18 & \\
9 & \\
\hline
\end{array}
\]

3. \[
\begin{array}{c|c}
\hline
n & n \times 7 \\
8 & 56 \\
9 & \\
11 & \\
12 & \\
\hline
\end{array}
\]

4. \[
\begin{array}{c|c}
\hline
n & 24 \div n \\
2 & 12 \\
6 & \\
4 & \\
8 & \\
\hline
\end{array}
\]

5. \[
\begin{array}{c|c}
\hline
n & n + 15 \\
35 & \\
5 & \\
20 & \\
85 & \\
\hline
\end{array}
\]

6. \[
\begin{array}{c|c}
\hline
n & n \times 2^3 \\
7 & \\
4 & \\
10 & \\
13 & \\
\hline
\end{array}
\]

7. A car is traveling at a speed of 55 miles per hour. You want to write an algebraic expression to show how far the car will travel in a certain number of hours. What will be your constant? your variable?

8. Shawn evaluated the algebraic expression \(x + 4\) for \(x = 12\) and gave an answer of 8. What was his error? What is the correct answer?

__________________________

__________________________

__________________________
Practice

Translate Between Words and Math

Write an expression.

1. Terry's essay has 9 more pages than Stacey's essay. If \( s \) represents the number of pages in Stacey's essay, write an expression for the number of pages in Terry's essay.

2. Let \( z \) represent the number of students in a class. Write an expression for the number of students in 3 equal groups.

Write each phrase as a numerical or algebraic expression.

3. 24 multiplied by 3
4. \( n \) multiplied by 14
5. \( w \) added to 64
6. the difference of 58 and 6
7. \( m \) subtracted from 100
8. the sum of 180 and 25
9. the product of 35 and \( x \)
10. the quotient of 63 and 9
11. 28 divided by \( p \)

Write two phrases for each expression.

12. \( n + 91 \)
13. \( 35 + r \)
14. \( 20 - s \)
15. Charles is 3 years older than Paul. If \( y \) represents Paul's age, what expression represents Charles's age?
16. Maya bought some pizzas for $12 each. If \( p \) represents the number of pizzas she bought, what expression shows the total amount she spent?
**Lesson 2-3**

**Translate Between Tables and Expressions**

Write an expression for the missing value in each table.

1. **Bicycles**  | **Wheels**  
   |   
   1 | 2  
   2 | 4  
   3 | 6  
   $b$  

2. **Ryan’s Age**  | **Mia’s Age**  
   |   
   14 | 7  
   16 | 9  
   18 | 11 
   $r$  

3. **Minutes**  | **Hours**  
   |   
   60 | 1  
   120| 2  
   180| 3  
   $m$  

4. **Bags**  | **Potatoes**  
   |   
   3 | 21 
   4 | 28 
   5 | 35 
   $b$  

Write an expression for the sequence in each table.

5. **Position**  | **Value of Term**  
   |   
   1 | 3  
   2 | 4  
   3 | 5  
   4 | 6  
   5 | 7 
   $n$  

6. **Position**  | **Value of Term**  
   |   
   1 | 5  
   2 | 9  
   3 | 13  
   4 | 17 
   5 | 21  
   $n$  

7. A rectangle has a width of 6 inches. The table shows the area of the rectangle for different widths. Write an expression that can be used to find the area of the rectangle when its length is $l$ inches.

<table>
<thead>
<tr>
<th>Width (in.)</th>
<th>Length (in.)</th>
<th>Area (in.$^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>8</td>
<td>48</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>$l$</td>
<td></td>
</tr>
</tbody>
</table>
Practice

Determine whether the given value of the variable is a solution.

1. \(9 + x = 21\) for \(x = 11\)  
2. \(n - 12 = 5\) for \(n = 17\)
3. \(25 \cdot r = 75\) for \(r = 3\)  
4. \(72 \div q = 8\) for \(q = 9\)
5. \(28 + c = 43\) for \(c = 15\)  
6. \(u + 11 = 10\) for \(u = 111\)
7. \(k = 4\) for \(k = 24\)  
8. \(16x = 48\) for \(x = 3\)
9. \(73 - f = 29\) for \(f = 54\)  
10. \(67 - j = 25\) for \(j = 42\)
11. \(39 + v = 13\) for \(v = 3\)  
12. \(88 + d = 100\) for \(d = 2\)
13. \(14p = 20\) for \(p = 5\)  
14. \(6w = 30\) for \(w = 5\)
15. \(7 + x = 70\) for \(x = 10\)  
16. \(6 \cdot n = 174\) for \(n = 29\)

Replace each \(\square\) with a number that makes the equation correct.

17. \(5 + 1 = 2 + \square\)  
18. \(10 - \square = 12 - 7\)
19. \(\square \cdot 3 = 2 \cdot 9\)  
20. \(28 \div 4 = 14 \div \square\)
21. \(\square + 8 = 6 + 3\)  
22. \(12 \cdot 0 = \square \cdot 15\)

23. Carla had $15. After she bought lunch, she had $8 left. Write an equation using the variable \(x\) to model this situation. What does your variable represent?

24. Seventy-two people signed up for the soccer league. After the players were evenly divided into teams, there were 6 teams in the league. Write an equation to model this situation using the variable \(x\).
Practice

Addition Equations

Solve each equation. Check your answers.

1. \( s + 3 = 23 \)

2. \( v + 10 = 49 \)

3. \( q + 9 = 16 \)

4. \( 81 + m = 90 \)

5. \( 38 + x = 44 \)

6. \( 28 + n = 65 \)

7. \( t + 31 = 50 \)

8. \( 25 + p = 39 \)

9. \( 19 + v = 24 \)

10. \( m + 8 = 17 \)

11. \( r + 14 = 20 \)

12. \( 25 + x = 32 \)

13. \( 47 + p = 55 \)

14. \( 19 + d = 27 \)

15. \( 13 + n = 26 \)

16. \( q + 12 = 19 \)

17. \( 34 + f = 43 \)

18. \( 52 + w = 68 \)

19. Kenya bought 28 beads, and Nancy bought 25 beads. It takes 35 beads to make a necklace. Write and solve two addition equations to find how many more beads they each need to make a necklace.

20. During a sales trip, Mr. Jones drove 15 miles east from Brownsville to Carlton. Then he drove several more miles east from Carlton to Sun City. The distance from Brownsville to Sun City is 35 miles. Write and solve an addition equation to find how many miles it is from Carlton to Sun City.
Practice

LESSON 2.45

Subtraction Equations

Solve each equation. Check your answers.

1. \( s - 8 = 12 \)  
2. \( v - 11 = 7 \)

3. \( 9 = q - 5 \)  
4. \( m - 21 = 5 \)

5. \( 34 = x - 12 \)  
6. \( n - 45 = 45 \)

7. \( f - 19 = 9 \)  
8. \( p - 6 = 27 \)

9. \( 15 = v - 68 \)

Solve each equation.

10. \( 7 = m - 5 \)  
11. \( r - 10 = 22 \)  
12. \( 16 = x - 4 \)

13. \( 40 = p - 11 \)  
14. \( 28 = d - 6 \)  
15. \( n - 9 = 42 \)

16. \( q - 85 = 8 \)  
17. \( f - 13 = 18 \)  
18. \( 47 = w - 38 \)

19. Ted took 17 pictures at the aquarium. He now has 7 pictures left on the roll. Write and solve a subtraction equation to find out how many photos Ted had when he went to the aquarium.

20. Ted bought a dolphin poster for $12. He now has $5. Write and solve a subtraction equation to find out how much money Ted took to the aquarium.
Practice

Multiplication Equations

Solve each equation. Check your answers.

1. \(8s = 72\)  
   \[s = \frac{72}{8} = 9\]

2. \(4v = 28\)  
   \[v = \frac{28}{4} = 7\]

3. \(27 = 9q\)  
   \[q = \frac{27}{9} = 3\]

4. \(12m = 60\)  
   \[m = \frac{60}{12} = 5\]

5. \(48 = 6x\)  
   \[x = \frac{48}{6} = 8\]

6. \(7n = 63\)  
   \[n = \frac{63}{7} = 9\]

7. \(10t = 130\)  
   \[t = \frac{130}{10} = 13\]

8. \(15p = 450\)  
   \[p = \frac{450}{15} = 30\]

9. \(84 = 6v\)  
   \[v = \frac{84}{6} = 14\]

Solve each equation.

10. \(49 = 7m\)  
    \[m = \frac{49}{7} = 7\]

11. \(20r = 80\)  
    \[r = \frac{80}{20} = 4\]

12. \(64 = 8x\)  
    \[x = \frac{64}{8} = 8\]

13. \(36 = 4p\)  
    \[p = \frac{36}{4} = 9\]

14. \(147 = 7d\)  
    \[d = \frac{147}{7} = 21\]

15. \(11n = 110\)  
    \[n = \frac{110}{11} = 10\]

16. \(12q = 144\)  
    \[q = \frac{144}{12} = 12\]

17. \(25f = 125\)  
    \[f = \frac{125}{25} = 5\]

18. \(128 = 16w\)  
    \[w = \frac{128}{16} = 8\]

19. A hot-air balloon flew at 10 miles per hour. Using the variable \(h\), write and solve a multiplication equation to find how many hours the balloon traveled if it covered a distance of 70 miles.
   \[70 = 10h\]  
   \[h = \frac{70}{10} = 7\]

20. A passenger helicopter can travel 300 miles in the same time it takes a hot-air balloon to travel 20 miles. Using the variable \(s\), write and solve a multiplication equation to find how many times faster the helicopter can travel than the hot air balloon.
   \[\frac{300}{20} = s\]  
   \[s = 15\]
Practice

**Division Equations**

Solve each equation. Check your answers.

1. \( \frac{3}{6} = 7 \)  
2. \( \frac{y}{5} = 9 \)  
3. \( 12 = \frac{a}{7} \)  

4. \( \frac{m}{2} = 16 \)  
5. \( 26 = \frac{x}{3} \)  
6. \( \frac{n}{8} = 4 \)  

7. \( \frac{r}{11} = 11 \)  
8. \( \frac{p}{7} = 10 \)  
9. \( 7 = \frac{v}{8} \)  

Solve each equation.

10. \( 10 = \frac{m}{9} \)  
11. \( \frac{r}{5} = 8 \)  
12. \( 11 = \frac{x}{7} \)  

13. \( \frac{q}{12} = 9 \)  
14. \( 15 = \frac{d}{5} \)  
15. \( \frac{n}{4} = 28 \)  

16. \( \frac{a}{2} = 134 \)  
17. \( \frac{u}{16} = 1 \)  
18. \( 2 = \frac{w}{25} \)  

19. All the seats in the theater are divided into 6 groups. There are 35 seats in each group. Using the variable \( s \), write and solve a division equation to find how many seats there are in the theater.

20. There are 16 ounces in one pound. A box of nails weighs 4 pounds. Using the variable \( w \), write and solve a division equation to find how many ounces the box weighs.
Write each decimal in standard form, expanded form, and words.

1. 2.07
2. $5 \div 110 = 0.007$
3. four and six tenths
4. sixteen and five tenths
5. $9 + 0.6 + 0.08$
6. 1.037
7. $2 + 0.1 + 0.003$
8. eighteen hundredths
9. 6.11

Order the decimals from least to greatest.

10. 3.578, 3.758, 3.875
11. 0.0943, 0.9403, 0.9043
12. 12.97, 12.957, 12.75
13. 1.09, 1.901, 1.9, 1.19

14. Your seventh and eighth ribs are two of the longest bones in your body. The average seventh rib is nine and forty-five hundredths inches long, and the average eighth rib is 9.06 inches long. Which bone is longer?

15. The average female human heart weighs nine and three tenths ounces, while the average male heart weighs eleven and one tenth ounces. Which human heart weighs less, the male or the female?

16. The state has $42.3 million for a new theater. The theater that an architect designed would cost $42.25 million. Can the theater be built for the amount the state can pay?

17. Lyn traveled 79.47 miles on Saturday, 54.28 miles on Sunday, 65.5 miles on Monday, and 98.43 miles on Tuesday. Which day did she travel the greatest number of miles?
Practice

**Estimating Decimals**

Estimate by rounding to the indicated place value.

1. 7.462 + 1.809; tenths
2. 15.3614 ÷ 2.0573; hundredths
3. 56.4059 − 4.837; ones
4. 0.60871 + 1.2103; hundredths

Estimate each product or quotient.

5. 42.1 • 5.97
6. 11.8 • 6.125
7. 63.78 ÷ 8.204
8. 7.539 • 3.0642
9. 80.794 ÷ 8.61
10. 19.801 • 2.78

Estimate a range for each sum.

11. 6.8 + 4.3 + 5.6
12. 12.63 + 9.86 + 20.30

13. Two sixth-grade classes are collecting money to buy a present for one of their teachers. One class collected $24.68 and the other class collected $30.25. About how much money did they collect in all? The gift they want to buy costs $69.75. About how much more money do they need?

14. On the highway, Anita drove an average speed of 60.2 miles per hour. At that speed, about how far can she travel in three and a half hours? At that same speed, about how many hours will it take Anita to drive 400 miles?
Find each sum or difference.

1. \(8.9 + 2.4\)  
2. \(12.7 - 9.6\)  
3. \(18.35 - 4.16\)  
4. \(7.21 + 11.6\)  
5. \(0.975 + 3.8\)  
6. \(20.66 - 9.1\)

7. Tiffany’s job requires a lot of driving. How many miles did she travel during the month of February?

8. Shelly babysits after school and on the weekends. How much did she earn in all for the month of April?

Evaluate \(5.6 - a\) for each value of \(a\).

9. \(a = 3.7\)  
10. \(a = 0.5\)  
11. \(a = 2.8\)  
12. \(a = 1.42\)  
13. \(a = 0.16\)  
14. \(a = 3.75\)

15. Allen bought a box of envelopes for \$2.79 and a pack of paper for \$4.50. He paid with a \$10 bill. How much change should be receive?

16. From a bolt of cloth measuring 25.60 yards, Tina cut a 6.8-yard piece and an 11.9-yard piece. How much material is left on the bolt?
Find each product.

1. $345 \cdot 100$
2. $65.2 \cdot 100$
3. $1.84 \cdot 1,000$

Write each number in scientific notation.

4. $16,700$
5. $4,680$
6. $58,340,000$

Write each number in standard form.

7. $3.25 \cdot 10^4$
8. $7.08 \cdot 10^6$
9. $1.209 \cdot 10^7$
10. $6.8 \cdot 10^8$
11. $0.51 \cdot 10^5$
12. $0.006 \cdot 10^3$

Identify the answer choice that is not equal to the given number.

13. 356,000
   A 300,000 + 56,000
   B $3.56 \cdot 10^5$
   C $3.56 \cdot 10^4$

14. $1.28 \cdot 10^6$
   A $100,000 + 28,000$
   B $1,280,000$
   C $12.8 \cdot 10^5$

15. 1,659,000
   A $1,600,000 + 59,000$
   B $1.659 \cdot 10^6$
   C $16.59 \cdot 10^5$

16. 0.074 • 10²
   A 70.0 + 4.0
   B $7.4 \cdot 10^5$
   C $7.4 \cdot 10^1$

17. In 2000, the population of Pennsylvania was 12,281,054. Round this figure to the nearest hundred thousand. Then write that number in scientific notation.

18. In 2000, the population of North Carolina was about 8.05 • 10⁶, and the population of South Carolina was about 4.01 • 10⁵. Write the combined populations of these two states in standard form.
Find each product.

1. 0.7 \times 0.3 \\
2. 0.05 \times 0.4 \\
3. 8.0 \times 0.02 \\

4. 3.5 \times 0.2 \\
5. 12.1 \times 0.01 \\
6. 9.0 \times 0.9 \\

7. 0.04 \times 0.58 \\
8. 2.15 \times 1.5 \\
9. 1.73 \times 0.8 \\

10. 6.017 \times 2.0 \\
11. 3.96 \times 0.4 \\
12. 0.7 \times 0.009 \\

Evaluate 8x for each value of x.

13. x = 0.5 \\
14. x = 2.3 \\
15. x = 0.74 \\

16. x = 3.12 \\
17. x = 0.587 \\
18. x = 14.08 \\

19. The average mail carrier walks 4.8 kilometers in a workday. How far do most mail carriers walk in a 6-day week? There are 27 working days in July, so how far will a mail carrier walk in July?

20. A deli charges $3.45 for a pound of turkey. If Tim wants to purchase 2.4 pounds, how much will it cost?
Practice

Dividing Decimals by Whole Numbers

Find each quotient.

1. \(0.81 \div 9\)  
2. \(1.84 \div 4\)  
3. \(7.2 \div 6\)

4. \(13.6 \div 8\)  
5. \(4.55 \div 5\)  
6. \(29.6 \div 8\)

7. \(15.57 \div 9\)  
8. \(0.144 \div 12\)  
9. \(97.5 \div 3\)

10. \(0.0025 \div 5\)  
11. \(2.84 \div 8\)  
12. \(18.9 \div 3\)

Evaluate \(2.094 \div x\) for each given value of \(x\).

13. \(x = 2\)  
14. \(x = 4\)  
15. \(x = 12\)

16. \(x = 20\)  
17. \(x = 15\)  
18. \(x = 30\)

19. There are three grizzly bears in the city zoo. Yogi weighs 400.5 pounds, Winnie weighs 560.35 pounds, and Nyla weighs 618.29 pounds. What is the average weight of the three bears?

20. The bill for dinner came to $75.48. The four friends decided to leave a $15.00 tip. If they shared the bill equally, how much will they each pay?
Name ___________________________ Date ___________ Class ___________

Practice

Dividing by Decimals

Find each quotient.
1. \(9.0 \div 0.9\)  
2. \(29.6 \div 3.7\)  
3. \(10.81 \div 2.3\)

4. \(10.5 \div 1.5\)  
5. \(15.36 \div 4.8\)  
6. \(9.75 \div 1.3\)

7. \(20.4 \div 5.1\)  
8. \(37.5 \div 2.5\)  
9. \(9.24 \div 1.1\)

10. \(16.56 \div 6.9\)  
11. \(28.9 \div 8.5\)  
12. \(14.35 \div 0.7\)

Evaluate \(x \div 1.2\) for each value of \(x\).
13. \(x = 40.8\)  
14. \(x = 1.8\)  
15. \(x = 10.8\)

16. \(x = 14.4\)  
17. \(x = 4.32\)  
18. \(x = 0.06\)

19. Anna is saving $6.35 a week to buy a computer game that costs $57.15. How many weeks will she have to save to buy the game?

20. Ben ran a 19.5-mile race last Saturday. His average speed during the race was 7.8 miles per hour. How long did it take Ben to finish the race?
Practice

LESSON 3-8 Interpret the Quotient

Circle the letter of the correct answer.

1. You spent a total of $6.75 for 15 yards of ribbon. How much did the ribbon cost per yard?
   A $0.50
   B $0.45
   C $1.35
   D $1.45

2. Buttons come in packs of 12. How many packs should you buy if you need 100 buttons?
   F 10
   G 8
   H 9
   J 12

3. Your sewing cabinet has compartments that hold 8 spools of thread each. You have 50 spools of thread. How many compartments can you fill?
   A 6
   B 7
   C 5
   D 8

4. You spent a total of $35.75 for velvet cloth. Each yard of the velvet costs $3.25. How many yards did you buy?
   F 10
   G 10.5
   H 11
   J 11.5

Write the correct answer.

5. You used a total of 67.5 yards of cotton material to make costumes for the play. Each costume used 11.25 yards of cloth. How many costumes did you make?

6. You are saving $17.00 each week to buy a new sewing machine that costs $175.50. How many weeks will you have to save to have enough money to buy the sewing machine?

7. Sequins come in packs of 75. You use 12 sequins on each costume. If you have one pack of sequins, how many costumes can you make?

8. You pay $26.28 for a subscription to Sewing Magazine. You get an issue every month for a year. How much does each issue cost?
Name ____________________________ Date _______ Class ______________

Practice

LESSON 17

Solving Decimal Equations

Solve each equation. Check your answer.

1. \( a - 2.7 = 4.8 \)
2. \( b + 7 = 1.9 \)

3. \( w - 6.5 = 3.8 \)
4. \( p + 0.4 = 1.7 \)

5. \( 4.5 + x = 8 \)
6. \( b + 3 = 2.5 \)

7. \( 7.8 + s = 15.2 \)
8. \( 1.63q = 9.78 \)

9. \( 0.05 + x = 2.06 \)
10. \( 1.7n = 2.38 \)

11. \( t - 6.08 = 12.59 \)
12. \( 9q = 16.2 \)

13. \( w - 8.9 = 10.3 \)
14. \( 1.4n = 3.22 \)

15. \( t - 12.7 = 0.8 \)
16. \( 3.8 + a = 6.5 \)

17. The distance around a square photograph is 12.8 centimeters. What is the length of each side of the photograph?

18. You buy two rolls of film for $3.75 each. You pay with a $10 bill. How much change should you get back?
Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, and 10.

1. 90
2. 416
3. 308
4. 540
5. 804
6. 225
7. 663
8. 972
9. 836

Tell whether each number is prime or composite.

10. 33
11. 69
12. 41
13. 45
14. 58
15. 87
16. 61
17. 53
18. 99

19. Dan counted all the coins in his bank, and he had 72 quarters. Can he exchange the quarters for an even amount of dollar bills? How do you know?

20. A small town purchased 196 American flags for its Memorial Day parade. Eight locations were selected to display the flags. Can each location have the same number of flags? If no, explain why not. If yes, how many flags will be displayed at each location?
Practice
Factors and Prime Factorization

List all of the factors of each number.

1. 15
   ___________
   ___________

2. 24
   ___________
   ___________

3. 33
   ___________
   ___________

4. 72
   ___________
   ___________

5. 48
   ___________
   ___________

6. 95
   ___________
   ___________

7. 66
   ___________
   ___________

8. 87
   ___________
   ___________

9. 36
   ___________
   ___________

Write the prime factorization of each number.

10. 44
    ___________
    ___________

11. 56
    ___________
    ___________

12. 42
    ___________
    ___________

13. 39
    ___________
    ___________

14. 36
    ___________
    ___________

15. 125
    ___________
    ___________

16. 85
    ___________
    ___________

17. 100
    ___________
    ___________

18. 32
    ___________
    ___________

19. James has an assigned seat for his flight to Denver. The seats on the plane are numbered 1–49. James’s seat number is an odd number greater than 10 that is factor of 100. What is his seat number for the flight?

20. Linda writes the prime factorization of 40 as $2 \cdot 2 \cdot 2 \cdot 5$ on the board. Phil writes the prime factorization of 40 as $2^3 \cdot 5$. Who is correct?
Find the GCF of each set of numbers.

1. 12 and 15
2. 18 and 24
3. 15 and 25
4. 16 and 24
5. 36 and 45
6. 24 and 54
7. 48 and 64
8. 27 and 72
9. 55 and 77
10. 16, 28, and 48
11. 15, 35, and 95
12. 20, 30, and 80
13. 18, 36, and 54
14. 27, 36, and 45
15. 21, 49, and 63
16. 25, 35, and 45
17. 28, 42, and 63
18. 25, 75, and 115

19. Mr. Thompson’s sixth-grade class is competing in the school field day. There are 16 boys and 12 girls in his class. He divided the class into the greatest number of teams possible with the same number of boys on each team and the same number of girls on each team. How many teams were made if each person was on a team? How many girls were on each team? How many boys?

20. Barbara is making candy bags for her birthday party. She has 24 lollipops, 12 candy bars, and 42 pieces of gum. She wants each bag to have the same number of each kind of candy. What is the greatest number of bags she can make if all the candy is used? How many pieces of each kind of candy will be in each bag?
Practice

Decimals and Fractions

Write each decimal as a fraction or mixed number.

1. 0.23
2. 0.1
3. 3.25

4. 1.3
5. 5.5
6. 3.7

Write each fraction or mixed number as a decimal.

7. \( \frac{4}{5} \)
8. \( \frac{1}{9} \)
9. \( 1\frac{2}{3} \)

10. \( 3\frac{3}{5} \)
11. \( 2\frac{1}{3} \)
12. \( \frac{8}{9} \)

Order the fractions and decimals from least to greatest.

13. \( \frac{1}{4}, 0.7, \frac{3}{5} \)
14. 0.25, \( \frac{1}{8}, 0.3 \)
15. \( \frac{9}{10}, 0.49, \frac{1}{2} \)

Order the fractions and decimals from greatest to least.

16. 0.13, \( \frac{1}{10}, 0.9 \)
17. \( \frac{2}{5}, 0.7, \frac{2}{3} \)
18. 0.65, \( \frac{4}{5}, \frac{3}{4} \)

19. Derrick has a dollar bill and three dimes, Jane has a dollar bill and one quarter, and Kelly has a dollar bill and ten nickels. Who has the most money? the least?

20. It rained three and one half inches in April. In May it rained \( 3\frac{3}{4} \) inches, and in June it rained 3.6 inches. Write the months in order from the greatest to the least amount of rain.
Find two equivalent fractions for each fraction.

1. \( \frac{3}{5} \)
2. \( \frac{4}{7} \)
3. \( \frac{11}{13} \)
4. \( \frac{2}{15} \)
5. \( \frac{5}{14} \)
6. \( \frac{8}{9} \)
7. \( \frac{2}{21} \)
8. \( \frac{24}{48} \)
9. \( \frac{25}{100} \)

Find the missing numbers that make the fractions equivalent.

10. \( \frac{4}{7} = \frac{?}{28} \)
11. \( \frac{2}{9} = \frac{?}{54} \)
12. \( \frac{36}{4} = \frac{?}{1} \)
13. \( \frac{56}{8} = \frac{?}{2} \)
14. \( \frac{3}{5} = \frac{?}{25} \)
15. \( \frac{4}{7} = \frac{?}{42} \)

Write each fraction in simplest form.

16. \( \frac{15}{25} \)
17. \( \frac{8}{36} \)
18. \( \frac{12}{18} \)
19. \( \frac{10}{24} \)

20. Billy had 24 trading cards. He gave 7 of his cards to Miko and 9 of his cards to Teri. What fraction of his original 24 cards does Billy have left? Write two equivalent fractions for that amount.

21. Beth and Kristine ride their bikes to school in the morning. Beth has to ride \( \frac{7}{32} \) miles. Kristine has to ride \( \frac{39}{32} \) miles. Who rides the farthest to reach school? Explain.
**Practice**

**Mixed Numbers and Improper Fractions**

Write each mixed number as an improper fraction.

1. \(3 \frac{1}{2}\)
2. \(2 \frac{2}{3}\)
3. \(5 \frac{1}{4}\)

4. \(1 \frac{3}{7}\)
5. \(3 \frac{3}{4}\)
6. \(4 \frac{1}{3}\)

7. \(2 \frac{3}{5}\)
8. \(3 \frac{5}{6}\)
9. \(7 \frac{1}{3}\)

Write each improper fraction as a mixed number or whole number. Tell whether your answer is a mixed number or whole number.

10. \(\frac{17}{3}\)
11. \(\frac{40}{8}\)
12. \(\frac{48}{7}\)

13. \(\frac{33}{10}\)
14. \(\frac{50}{8}\)
15. \(\frac{83}{9}\)

16. \(\frac{104}{8}\)
17. \(\frac{121}{6}\)
18. \(\frac{78}{11}\)

19. The hotel ordered an extra-long rug for a hallway that is \(123\frac{3}{4}\) feet long. What is the rug’s length in feet and inches? Remember, 1 foot = 12 inches.

20. During this year’s football-throwing contest, John threw the ball \(49\frac{2}{3}\) feet. Sharon threw the ball 51 feet. Who threw the ball \(\frac{153}{3}\) feet?
Name ____________________________ Date ______ Class ________

LESSON 7

Practice

Comparing and Ordering Fractions

Compare. Write <, >, or =.

1. \( \frac{3}{7} \) _____ \( \frac{3}{5} \) 
2. \( \frac{1}{8} \) _____ \( \frac{2}{3} \) 
3. \( \frac{1}{4} \) _____ \( \frac{2}{5} \) 

4. \( \frac{7}{9} \) _____ \( \frac{5}{6} \) 
5. \( \frac{18}{24} \) _____ \( \frac{3}{4} \) 
6. \( \frac{4}{5} \) _____ \( \frac{8}{12} \) 

Order the fractions from least to greatest.

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

10. \( \frac{3}{9} \), \( \frac{3}{7} \), \( \frac{2}{3} \) 
11. \( \frac{3}{8} \), \( \frac{2}{7} \), \( \frac{3}{5} \) 
12. \( \frac{2}{7} \), \( \frac{1}{8} \), \( \frac{2}{5} \) 

Order the fractions from greatest to least.

13. \( \frac{2}{6} \), \( \frac{1}{7} \), \( \frac{5}{5} \) 
14. \( \frac{3}{7} \), \( \frac{4}{9} \), \( \frac{2}{3} \) 
15. \( \frac{2}{5} \), \( \frac{3}{10} \), \( \frac{2}{3} \) 

16. \( \frac{4}{5} \), \( \frac{7}{10} \), \( \frac{1}{12} \) 
17. \( \frac{3}{8} \), \( \frac{3}{4} \), \( \frac{4}{9} \) 
18. \( \frac{4}{7} \), \( \frac{3}{5} \), \( \frac{5}{6} \) 

19. David ran \( \frac{5}{4} \) miles, Shane ran \( \frac{7}{2} \) miles, and Matt ran \( \frac{5}{8} \) miles. Who ran the farthest?

20. Darius and Anita both took the same test. Darius answered \( \frac{5}{6} \) of the questions correctly, and Anita answered \( \frac{6}{7} \) correctly. Who got the higher score on the test?
Subtract. Write each answer in simplest form.

1. \[ \frac{1}{7} - \frac{4}{7} \]

2. \[ \frac{18}{24} - \frac{10}{24} \]

3. \[ \frac{2\frac{2}{3}}{3} - \frac{1\frac{1}{3}}{3} \]

4. \[ 8\frac{11}{13} - 5\frac{2}{13} \]

5. \[ 5 - 3\frac{1}{4} \]

6. \[ 2 - 1\frac{2}{7} \]

7. \[ 6\frac{8}{9} - 4\frac{8}{9} \]

8. \[ 7\frac{4}{11} - 6\frac{3}{11} \]

9. \[ 10 - 5\frac{3}{5} \]

Evaluate each expression for \( x = \frac{2}{15} \). Write each answer in simplest form.

10. \[ x + \frac{14}{15} \]

11. \[ x - \frac{1}{15} \]

12. \[ \frac{13}{15} - x \]

13. \[ x + \frac{7}{15} \]

Write each sum or difference in simplest form.

14. \[ \frac{17}{21} - \frac{2}{21} \]

15. \[ \frac{13}{32} + \frac{9}{32} \]

16. \[ \frac{2}{15} + \frac{8}{15} \]

17. \[ \frac{76}{100} - \frac{14}{100} \]

18. \[ \frac{1}{15} + \frac{4}{15} + \frac{5}{15} \]

19. \[ \frac{9}{26} + \frac{2}{26} + \frac{5}{26} \]

20. Maria has 8 gallons of paint she wants to use in three rooms of her house. She will use \( 2\frac{1}{4} \) gallons in the bedroom and \( 1\frac{1}{2} \) gallons in the bathroom. Use pictures to model how many gallons she will have left to paint the playroom, and then write your answer in simplest form.
Lesson 49
Estimating Fraction Sums and Differences

Estimate each sum or difference by rounding to 0, \( \frac{1}{2} \), or 1.

1. \( \frac{5}{6} + \frac{3}{10} \)  
2. \( \frac{7}{9} - \frac{4}{5} \)  
3. \( \frac{9}{10} - \frac{3}{7} \)

4. \( \frac{4}{9} + \frac{1}{4} \)  
5. \( \frac{1}{8} + \frac{1}{6} \)  
6. \( \frac{7}{8} - \frac{4}{5} \)

7. \( \frac{3}{8} + \frac{2}{7} \)  
8. \( \frac{7}{10} + \frac{11}{12} \)  
9. \( \frac{8}{9} + \frac{4}{7} \)

10. \( \frac{5}{11} + \frac{2}{7} \)  
11. \( \frac{6}{11} - \frac{2}{5} \)  
12. \( \frac{2}{7} - \frac{7}{9} \)

Use the table for Exercises 13–15.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount (cups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange juice</td>
<td>( \frac{4}{5} )</td>
</tr>
<tr>
<td>Cranberry juice</td>
<td>( \frac{5}{4} )</td>
</tr>
<tr>
<td>Ginger ale</td>
<td>( \frac{7}{6} )</td>
</tr>
</tbody>
</table>

13. About how much more orange juice than ginger ale is used in the punch?

14. About how much juice is used in the punch?

15. About how many cups of fruit punch does this recipe make?

16. Damonte rolled the medicine ball 9\( \frac{3}{4} \) feet. Zachary rolled it 9\( \frac{1}{2} \) feet. Who rolled the medicine ball the farthest? About how much farther?

17. Sara ran 5\( \frac{6}{7} \) miles on Monday and 4\( \frac{1}{4} \) miles on Tuesday. About how many miles did she run in all during those two days?
Practice

Lesson Least Common Multiple

Find the least common multiple (LCM).

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

4. 6 and 8
5. 5 and 9
6. 4 and 5

7. 10 and 15
8. 8 and 12
9. 6 and 10

10. 3, 6, and 9
11. 2, 5, and 10
12. 4, 7, and 14

13. 3, 5, and 9
14. 2, 5, and 8
15. 3, 9, and 12

16. Mr. Stevenson is ordering shirts and hats for his Boy Scout troop. There are 45 scouts in the troop. Hats come in packs of 3, and shirts come in packs of 5. What is the least number of packs of each he should order so that each scout will have 1 hat and 1 shirt, and none will be left over?

15 packs of hats and 9 packs of shirts

17. Tony wants to make 36 party bags. Glitter pens come in packs of 6. Stickers come in sheets of 4, and balls come in packs of 3. What is the least number of each package he should buy to have 1 of each item in every party bag, and no supplies left over?

6 packs of pens, 9 sheets of stickers, and 12 packs of balls

18. Glenda is making 30 school supply baskets. Notepads come in packs of 5. Erasers come in packs of 15, and markers come in packs of 3. What is the least number of each package she should buy to have 1 of each item in every basket, and no supplies left over?

6 packs of notepads, 2 packs of erasers, and 10 packs of markers
Name _____________________ Date __________ Class __________

**Practice**

**Lesson 5-2**

Adding and Subtracting with Unlike Denominators

Add or subtract. Write each answer in simplest form.

1. \( \frac{5}{7} + \frac{1}{3} \)  
2. \( \frac{3}{7} - \frac{2}{5} \)  
3. \( \frac{1}{4} + \frac{3}{8} \)

4. \( \frac{7}{8} - \frac{2}{3} \)  
5. \( \frac{1}{6} + \frac{3}{5} \)  
6. \( \frac{5}{6} - \frac{2}{3} \)

7. \( \frac{5}{9} - \frac{1}{3} \)  
8. \( \frac{7}{8} + \frac{3}{4} \)  
9. \( \frac{5}{12} - \frac{1}{6} \)

10. \( \frac{2}{5} - \frac{7}{11} \)  
11. \( \frac{4}{9} + \frac{5}{6} \)  
12. \( \frac{5}{8} + \frac{2}{3} \)

Evaluate each expression for \( b = \frac{1}{3} \). Write your answer in simplest form.

13. \( b + \frac{5}{8} \)  
14. \( \frac{7}{9} - b \)  
15. \( \frac{2}{7} + b \)

16. \( b + b \)  
17. \( \frac{11}{12} - b \)  
18. \( \frac{3}{4} - b \)

19. There are three grades in Kyle’s middle school—sixth, seventh, and eighth. One-third of the students are in sixth grade and \( \frac{1}{4} \) are in seventh grade. What fraction of the schools’ students are in eighth grade?

20. Sarah is making a dessert that calls for \( \frac{4}{5} \) cup of crushed cookies. If she has already crushed \( \frac{7}{10} \) cup, how much more does she need?
Find each sum or difference. Write the answer in simplest form.

1. \(4 \frac{3}{5} + 5 \frac{1}{4}\)  
2. \(11 \frac{2}{5} - 8 \frac{1}{3}\)  
3. \(7 \frac{1}{3} + 3 \frac{2}{9}\)

4. \(22 \frac{5}{6} - 17 \frac{1}{4}\)  
5. \(32 \frac{4}{7} - 14 \frac{1}{3}\)  
6. \(12 \frac{1}{4} + 5 \frac{1}{12}\)

7. \(29 \frac{1}{3} - 14 \frac{1}{6}\)  
8. \(5 \frac{3}{4} - 1 \frac{7}{11}\)  
9. \(2 \frac{3}{6} + 1 \frac{3}{8}\)

10. \(15 \frac{7}{12} - 14 \frac{3}{8}\)  
11. \(5 \frac{6}{15} + 4 \frac{3}{10}\)  
12. \(25 \frac{1}{7} + 25 \frac{2}{5}\)

13. \(3 \frac{2}{5} + 1 \frac{1}{3}\)  
14. \(1 \frac{8}{5} - 1 \frac{2}{10}\)  
15. \(3 \frac{3}{5} - 2 \frac{1}{2}\)

16. \(6 \frac{3}{4} - 3 \frac{3}{10}\)  
17. \(4 \frac{4}{5} + 2 \frac{1}{10}\)  
18. \(32 \frac{2}{1} + 5 \frac{1}{3}\)

19. Donald is making a party mix. He bought \(2 \frac{1}{4}\) pounds of pecans and \(3 \frac{3}{8}\) pounds of walnuts. How many pounds of nuts did Donald buy in all?

20. Mrs. Watson’s cookie recipe calls for \(3 \frac{4}{5}\) cups of sugar. Mr. Clark’s cookie recipe calls for \(4 \frac{2}{5}\) cups of sugar. How much more sugar does Mr. Clark’s recipe use?

21. Tasha’s cat weighs \(15 \frac{5}{12}\) lb. Naomi’s cat weighs \(11 \frac{1}{3}\) lb. Can they bring both of their cats to the vet in a carrier that can hold up to 27 pounds? Explain.
Subtract. Write each answer in simplest form.

1. $4 - 2\frac{5}{6}$
2. $5\frac{1}{6} - 2\frac{2}{3}$
3. $14 - 8\frac{2}{9}$

4. $19\frac{1}{7} - 5\frac{1}{3}$
5. $7\frac{1}{4} - 3\frac{5}{9}$
6. $10\frac{1}{5} - 5\frac{7}{10}$

7. $1\frac{1}{6} - 7\frac{7}{9}$
8. $9\frac{1}{4} - 1\frac{7}{16}$
9. $3\frac{1}{5} - 3\frac{3}{4}$

Evaluate each expression for $a = 1\frac{1}{2}$, $b = 2\frac{1}{3}$, $c = \frac{1}{4}$, and $d = 3$. Write the answer in simplest form.

10. $b - a$
11. $a - c$
12. $b - c$

13. $d - a$
14. $d - b$
15. $d - c$

16. Tim had 6 feet of wrapping paper for Kylie’s birthday present. He used 3\frac{3}{6} feet of the paper to wrap her gift. How much paper did Tim have left?

17. At his last doctor’s visit, Pablo was 60\frac{1}{2} inches tall. At today’s visit, he measured 61\frac{1}{6} inches. How much did Pablo grow between visits?

18. Yesterday, Danielle rode her bike for 5\frac{1}{2} miles. Today, she rode her bike for 6\frac{1}{4} miles. How much farther did Danielle ride her bike today?
Name ___________________________ Date _________ Class __________

Lesson 5.3
Solving Fraction Equations: Addition and Subtraction

Solve each equation. Write the solution in simplest form. Check your answers.

1. \( k + 3 \frac{3}{4} = 5 \frac{2}{3} - 1 \frac{1}{3} \)
2. \( a - 2 \frac{2}{11} = 2 \frac{5}{22} - 1 \frac{2}{11} \)

3. \( 2 \frac{2}{7} = n - 4 \frac{5}{3} - 1 \frac{1}{3} \)

4. \( 6 \frac{1}{4} = z + 1 \frac{5}{8} \)

5. \( 5 \frac{1}{4} = x + \frac{7}{16} \)

6. \( r + 6 = 9 \frac{2}{5} - 2 \frac{1}{2} \)

7. \( 11 \frac{2}{5} = q - 4 \frac{2}{9} + 2 \frac{1}{7} \)

8. \( 4 \frac{2}{5} - 2 \frac{1}{2} = p + \frac{3}{10} \)

9. \( \frac{3}{8} + \frac{1}{6} = c - 4 \frac{5}{6} \)

10. \( 2 \frac{1}{4} + c = 2 \frac{1}{5} + 1 \frac{1}{6} \)

11. A seamstress raised the hem on Helen’s skirt by \( 1 \frac{1}{3} \) inches. The skirt’s original length was 16 inches. What is the new length?

12. The bike trail is \( 5 \frac{1}{4} \) miles long. Jessie has already cycled \( 2 \frac{5}{8} \) miles of the trail. How much farther does she need to go to finish the trail?
Multiply. Write each answer in simplest form.

1. \[5 \cdot \frac{1}{10}\]
2. \[6 \cdot \frac{1}{18}\]
3. \[4 \cdot \frac{1}{14}\]
4. \[3 \cdot \frac{1}{12}\]
5. \[2 \cdot \frac{1}{8}\]
6. \[6 \cdot \frac{1}{10}\]
7. \[3 \cdot \frac{1}{6}\]
8. \[3 \cdot \frac{5}{12}\]
9. \[3 \cdot \frac{2}{7}\]
10. \[2 \cdot \frac{3}{8}\]
11. \[10 \cdot \frac{3}{15}\]
12. \[8 \cdot \frac{2}{14}\]
13. \[5 \cdot \frac{2}{10}\]
14. \[4 \cdot \frac{4}{12}\]
15. \[2 \cdot \frac{13}{20}\]

Evaluate \(6x\) for each value of \(x\). Write the answer in simplest form.

16. \(x = \frac{2}{3}\)
17. \(x = \frac{2}{8}\)
18. \(x = \frac{1}{4}\)
19. \(x = \frac{2}{6}\)
20. \(x = \frac{2}{7}\)
21. \(x = \frac{2}{5}\)
22. \(x = \frac{3}{11}\)
23. \(x = \frac{5}{12}\)

24. Thomas spends 60 minutes exercising. For \(\frac{1}{4}\) of that time, he jumps rope. How many minutes does he spend jumping rope?

25. Kylie made a 4-ounce milk shake. Two-thirds of the milk shake was ice cream. How many ounces of ice cream did Kylie use in the shake?
Multiply. Write each answer in simplest form.

1. \( \frac{1}{2} \times \frac{2}{5} \)
2. \( \frac{1}{3} \times \frac{7}{8} \)
3. \( \frac{2}{3} \times \frac{4}{6} \)

4. \( \frac{1}{4} \times \frac{10}{11} \)
5. \( \frac{3}{5} \times \frac{2}{3} \)
6. \( \frac{8}{9} \times \frac{3}{4} \)

7. \( \frac{3}{6} \times \frac{4}{5} \)
8. \( \frac{2}{7} \times \frac{3}{4} \)
9. \( \frac{1}{6} \times \frac{2}{3} \)

Evaluate the expression \( x \times \frac{1}{5} \) for each value of \( x \). Write the answer in simplest form.

10. \( x = \frac{3}{7} \)
11. \( x = \frac{5}{6} \)
12. \( x = \frac{2}{3} \)

13. \( x = \frac{10}{11} \)
14. \( x = \frac{5}{8} \)
15. \( x = \frac{4}{5} \)

16. A cookie recipe calls for \( \frac{2}{3} \) cup of brown sugar. Sarah is making \( \frac{1}{4} \) of the recipe. How much brown sugar will she need?

17. Nancy spent \( \frac{2}{3} \) hour working out at the gym. She spent \( \frac{5}{7} \) of that time lifting weights. What fraction of an hour did she spend lifting weights?
Practice

Multiplying Mixed Numbers

Multiply. Write each answer in simplest form.

1. $\frac{2}{3} \cdot \frac{4}{5}$
2. $1\frac{7}{8} \cdot \frac{4}{5}$
3. $2\frac{3}{4} \cdot \frac{1}{5}$

4. $2\frac{1}{6} \cdot \frac{2}{3}$
5. $2\frac{2}{5} \cdot \frac{3}{8}$
6. $1\frac{3}{4} \cdot \frac{5}{6}$

7. $1\frac{1}{6} \cdot \frac{3}{8}$
8. $\frac{2}{9} \cdot 2\frac{1}{7}$
9. $2\frac{3}{11} \cdot \frac{7}{10}$

Find each product. Write the answer in simplest form.

10. $\frac{3}{7} \cdot 1\frac{1}{4}$
11. $\frac{5}{8} \cdot 1\frac{3}{5}$
12. $2\frac{4}{3} \cdot \frac{1}{6}$

13. $1\frac{3}{10} \cdot 1\frac{1}{3}$
14. $2\frac{1}{2} \cdot 2\frac{1}{2}$
15. $1\frac{2}{3} \cdot 3\frac{1}{2}$

16. Dominick lives $1\frac{3}{4}$ miles from his school. If his mother drives him half the way, how far will Dominick have to walk to get to school?

17. Katoni bought $2\frac{1}{2}$ dozen donuts to bring to the office. Since there are 12 donuts in a dozen, how many donuts did Katoni buy?
Practice

Dividing Fractions and Mixed Numbers

Find the reciprocal.

1. \(\frac{5}{7}\)  
2. \(\frac{9}{6}\)  
3. \(\frac{3}{5}\)

4. \(\frac{1}{10}\)

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

6. \(\frac{13}{14}\)

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

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

9. \(3\frac{1}{6}\)

Divide. Write each answer in simplest form.

10. \(\frac{5}{6} + 5\)

11. \(2\frac{3}{4} + 1\frac{4}{7}\)

12. \(\frac{7}{8} + \frac{2}{3}\)

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

14. \(\frac{9}{10} + 3\)

15. \(\frac{3}{4} + 9\)

16. \(2\frac{8}{9} + \frac{6}{7}\)

17. \(\frac{5}{6} + 2\frac{3}{10}\)

18. \(2\frac{1}{8} + 3\frac{1}{4}\)

19. The rope in the school gymnasium is 10\(\frac{1}{2}\) feet long. To make it easier to climb, the gym teacher tied a knot in the rope every \(\frac{3}{4}\) foot. How many knots are in the rope?

20. Mr. Fulton bought 12\(\frac{1}{2}\) pounds of ground beef for the cookout. He plans on using \(\frac{1}{4}\) pound of beef for each hamburger. How many hamburgers can he make?

21. Mrs. Marks has 9\(\frac{1}{4}\) ounces of fertilizer for her plants. She plans on using \(\frac{3}{4}\) ounce of fertilizer for each plant. How many plants can she fertilize?
Practice

Solving Fraction Equations: Multiplication and Division

Solve each equation. Write the answer in simplest form. Check your answers.

1. \( \frac{1}{2}x = 6 \)
2. \( 2t = \frac{4}{7} \)
3. \( \frac{3}{5}a = 3 \)

4. \( \frac{r}{6} = 8 \)
5. \( \frac{2b}{9} = 4 \)
6. \( 3y = \frac{4}{5} \)

7. \( \frac{2}{3}d = 5 \)
8. \( 2f = \frac{1}{6} \)
9. \( 4q = \frac{2}{9} \)

10. \( \frac{1}{2}s = 2 \)
11. \( \frac{h}{7} = 5 \)
12. \( \frac{1}{4}c = 9 \)

13. \( 5g = \frac{5}{6} \)
14. \( 3k = \frac{1}{9} \)
15. \( \frac{3x}{5} = 6 \)

16. It takes 3 buckets of water to fill \( \frac{1}{3} \) of a fish tank. How many buckets are needed to fill the whole tank?

17. Jenna got 12, or \( \frac{3}{5} \), of her answers on the test right. How many questions were on the test?

18. It takes Charles 2 minutes to run \( \frac{1}{4} \) of a mile. How long will it take Charles to run a mile?
Complete each activity and answer each question.

1. Pizza Express sells different-sized pizzas. The jumbo pizza has 20 slices. The extra large has 16 slices. The large has 12 slices. There are 8 slices in a medium, and 6 slices in a small. A personal-sized pizza has 4 slices. Use this data to complete the table at right, from largest to smallest pizza.

<table>
<thead>
<tr>
<th>Size</th>
<th>Slices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumbo</td>
<td>20</td>
</tr>
<tr>
<td>Extra Large</td>
<td>16</td>
</tr>
<tr>
<td>Large</td>
<td>12</td>
</tr>
<tr>
<td>Medium</td>
<td>8</td>
</tr>
<tr>
<td>Small</td>
<td>6</td>
</tr>
<tr>
<td>Personal</td>
<td>4</td>
</tr>
</tbody>
</table>

2. What pattern do you see in the table’s data?

3. A plain large pizza at Pizza Express costs $13.75. A large pizza with one topping costs $14.20. A 2-topping large pizza costs $14.65, and a 3-topping large pizza costs $15.10. If you want 4 toppings on your large pizza, it will cost you $15.55. Use this data to complete the table at right.

<table>
<thead>
<tr>
<th>Toppings</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$13.75</td>
</tr>
<tr>
<td>1</td>
<td>$14.20</td>
</tr>
<tr>
<td>2</td>
<td>$14.65</td>
</tr>
<tr>
<td>3</td>
<td>$15.10</td>
</tr>
<tr>
<td>4</td>
<td>$15.55</td>
</tr>
</tbody>
</table>

4. What pattern do you see in the table’s data?

5. How much does each slice of a 1-topping large pizza from Pizza Express cost? Round your answer to the nearest hundredth of a dollar.

6. You and three friends buy two large pizzas from Pizza Express. One pizza has pepperoni and onions, and one pizza is plain. If you equally share the total price, how much will you each pay? How many slices will you each get?
Find the mean of each data set.

1. Brian's Math Test Scores 86 90 93 85 79 92

2. Heights of Basketball Players (in.) 72 75 78 72 73

Find the mean, median, mode, and range of each data set.

3. School Sit-Up Records (sit-ups per minute) 31 28 30 31 30

4. Team Heart Rates (beats per min) 70 68 70 72 68 66

5. Daily Winter Temperatures (°F) 45 50 47 52 53 45 51

6. Anita has two sisters and three brothers. The mean of all their ages is 6 years. What will their mean age be 10 years from now? Twenty years from now?

7. In a class of 28 sixth graders, all but one of the students are 12 years old. Which two data measurements are the same for the student's ages? What are those measurements?
Use the table to answer Exercises 1–2.

1. The table shows population data for some of the least-crowded states. Find the mean, median, and mode of the data.

2. Alaska has the lowest population density of any state. Only about 1 person per square mile lives there. Add this number to the data in the table and find the mean, median, and mode.

Use the table to answer Exercises 3–4.

3. The table shows some of the states with the most counties. Find the mean, median, and mode of the data.

4. With 254 counties, Texas has more counties than any other state. Add this number to the data in the table and find the mean, median, and mode.

5. In Exercise 1, which measurement best describes the data? Why is Alaska’s population density an outlier for that data set?

6. In Exercise 4, why is the number of counties in Texas an outlier for the data set? Which measurement best describes the data set with Texas included?

---

**Population Densities**

<table>
<thead>
<tr>
<th>State</th>
<th>People (per mi²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>16</td>
</tr>
<tr>
<td>Nevada</td>
<td>18</td>
</tr>
<tr>
<td>New Mexico</td>
<td>15</td>
</tr>
<tr>
<td>North Dakota</td>
<td>9</td>
</tr>
<tr>
<td>South Dakota</td>
<td>10</td>
</tr>
</tbody>
</table>

**State Counties**

<table>
<thead>
<tr>
<th>State</th>
<th>Number of Counties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>102</td>
</tr>
<tr>
<td>Iowa</td>
<td>99</td>
</tr>
<tr>
<td>North Carolina</td>
<td>100</td>
</tr>
<tr>
<td>Tennessee</td>
<td>95</td>
</tr>
<tr>
<td>Virginia</td>
<td>95</td>
</tr>
</tbody>
</table>

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Use the bar graph to answer each question.

1. In which country did people spend the most money on toys in 2000?

2. In which two countries did people spend the same amount of money on toys in 2000? How much did they each spend?

3. In which country did people spend $9 million on toys in 2000?

Make a bar graph to compare the data in the table.

**Female Groups with the Most Top 10 and Top 20 Hits**

<table>
<thead>
<tr>
<th></th>
<th>Top 10</th>
<th>Top 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Supremes</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>The Pointer Sisters</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>TLC</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>En Vogue</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Spice Girls</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

**Female Groups with the Most Top 10 and Top 20 Hits**

<table>
<thead>
<tr>
<th>Artist</th>
<th>Number of Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Supremes</td>
<td>25</td>
</tr>
<tr>
<td>The Pointer Sisters</td>
<td>20</td>
</tr>
<tr>
<td>The Pointer Sisters</td>
<td>15</td>
</tr>
<tr>
<td>TLC</td>
<td>10</td>
</tr>
<tr>
<td>En Vogue</td>
<td>5</td>
</tr>
<tr>
<td>Spice Girls</td>
<td>0</td>
</tr>
</tbody>
</table>

Key: Top 10 Top 20
1. Students voted for a day not to have homework. The results are shown in the box. Make a tally table. Which day got the most votes?

<table>
<thead>
<tr>
<th>Monday</th>
<th>Friday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Tuesday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday</td>
<td>Thursday</td>
<td>Wednesday</td>
<td>Monday</td>
<td>Friday</td>
<td>Monday</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mon</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thurs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fri</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Make a line plot of the data.

<table>
<thead>
<tr>
<th>Average Time Spent on Homework Per Day (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 21 24 20 21 20 20 22 25 20</td>
</tr>
<tr>
<td>22 20 24 25 24 25 25 21 25 24</td>
</tr>
</tbody>
</table>

3. Use the data in the box below to make a frequency table with intervals.

<table>
<thead>
<tr>
<th>Class Social Studies Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>78 95 81 83 75 68 100 73 92 85</td>
</tr>
<tr>
<td>59 70 88 92 99 87 75 67 89 84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class Social Studies Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scores</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Practice

Ordered Pairs

Name the ordered pair for each location on the grid.

1. gym __________
2. dining hall __________
3. offices __________
4. library __________
5. classrooms __________
6. dormitories __________

Graph and label each point on the coordinate grid.

7. A \((5, 1\frac{1}{2})\)
8. B \((2, 2)\)
9. C \((1, 3)\)
10. D \((4, 3)\)
11. E \((5, 5)\)
12. F \((2, 4)\)

13. On a map of his neighborhood, Mark’s house is located at point \((7, 3)\). His best friend, Cheryl, lives 2 units west and 1 unit south of him. What ordered pair describes the location of Cheryl’s house on their neighborhood map?

14. Quan used a coordinate grid map of the zoo during his visit. Starting at \((0, 0)\), he walked 3 units up and 4 units to the right to reach the tiger cages. Then he walked 1 unit down and 1 unit left to see the pandas. Describe the directions Quan should walk to get back to his starting point.
Practice

Line Graphs

Use the line graph to answer each question.

1. In which year were the average weekly earnings in the United States the highest?

2. In general, how did average weekly earnings in the United States change between 1970 and 2000?

3. In which year did the average United States worker earn about $350 a week?

4. Use the given data to make a line graph.

5. Between which two years shown on the graph did the U.S. minimum wage change the least?

6. How has the hourly minimum wage changed in the U.S. since 1970?
Misleading Graphs

Use the graph to answer each question.

1. Why is this bar graph misleading?
   [Answer: Because the lower art of the vertical scale is missing, the differences in grades are exaggerated.]

2. What might people believe from the misleading graph?
   [Answer: There are 4 times as many students in the 8th grade than the 6th grade.]

Use the graph to answer each question.

3. Why is this line graph misleading?
   [Answer: Because there is a break in the vertical scale, the differences in attendance seem greater than they are.]

4. What might people believe from the misleading graph?
   [Answer: In some months, 3 times more people attended soccer games than lacrosse games.]

---

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Holt Mathematics
Complete each activity and answer the questions.

1. Use the data in the table to complete the stem-and-leaf plot below.

<table>
<thead>
<tr>
<th>Richmond, Virginia, Monthly Normal Temperatures (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
</tr>
<tr>
<td>37</td>
</tr>
</tbody>
</table>

**Stem | Leaves**

| Key: 1 | 2 = __________ |

Find each value of the data.

2. least value _________
3. greatest value _________
4. mean __________
5. median __________
6. mode __________
7. range __________

8. Look at the stem-and-leaf plot you made for Exercise 1. How many months in Richmond have a normal temperature above 70°F?

9. How would you display a data value of 100 on the stem-and-leaf plot above?

__________________________

__________________________


1. The table shows the heights of the 6 tallest buildings in the world. Which graph would be more appropriate to show the data—a line graph or a bar graph? Draw the more appropriate graph.

<table>
<thead>
<tr>
<th>Building</th>
<th>Sears Tower</th>
<th>CITIC Plaza</th>
<th>Petronas Tower I</th>
<th>Petronas Tower II</th>
<th>Jin Mao Building</th>
<th>Two Finance Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (ft)</td>
<td>1,450</td>
<td>1,283</td>
<td>1,483</td>
<td>1,483</td>
<td>1,381</td>
<td>1,352</td>
</tr>
</tbody>
</table>

2. The table shows the test scores of some sixth-grade students. Which graph would be more appropriate to show the data—a stem-and-leaf plot or a line graph? Draw the more appropriate graph.

<table>
<thead>
<tr>
<th>Test Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
</tr>
</tbody>
</table>
Name ___________________________ Date ______ Class ______

LESSON 7A  Ratios and Rates

Use the table to write each ratio.

1. lions to elephants ____________

2. giraffes to otters ____________

3. lions to seals ____________

4. seals to elephants ____________

5. elephants to lions ____________

6. Write three equivalent ratios to compare the number of diamonds with the number of spades in the box.

   Diamonds: ____________
   Spades: ____________

   Possible answer: 6:9, 2:3, 12:18

   12:9 or 4:3
   10:12 or 5:6
   9:10
   8:16 or 1:2
   9:12 or 3:4

Use the table to write each ratio as a fraction.

7. Titans wins to Titans losses ______

8. Orioles losses to Orioles wins ______

9. Titans losses to Orioles losses ______

10. Orioles wins to Titans wins ______

Baseball Team Stats

<table>
<thead>
<tr>
<th></th>
<th>Titans</th>
<th>Orioles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wins</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Losses</td>
<td>14</td>
<td>15</td>
</tr>
</tbody>
</table>

11. A 6-ounce bag of raisins costs $2.46. An 8-ounce bag of raisins costs $3.20. Which is the better deal? ______

12. Barry earns $36.00 for 6 hours of yard work. Henry earns $24.00 for 3 hours of yard work. Who has the better hourly rate of pay? ______
Use a table to find three equivalent ratios.

1. 4 to 7
2. \( \frac{10}{3} \)
3. 2:5
4. 8 to 9
5. 3 to 15
6. \( \frac{30}{90} \)
7. 1:3
8. \( \frac{7}{2} \)

9. Britney does sit-ups every day. The table shows how long it takes her to do different numbers of sit-ups.

<table>
<thead>
<tr>
<th>Number of Sit-Ups</th>
<th>10</th>
<th>30</th>
<th>50</th>
<th>200</th>
<th>220</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (min)</td>
<td>2</td>
<td>6</td>
<td>10</td>
<td>40</td>
<td>44</td>
</tr>
</tbody>
</table>

How long do you predict it will take Britney to do 120 sit-ups?

10. The School Supply Store has markers on sale. The table shows some sale prices.

<table>
<thead>
<tr>
<th>Number of Markers</th>
<th>12</th>
<th>8</th>
<th>6</th>
<th>4</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost ($)</td>
<td>9.00</td>
<td>6.00</td>
<td>4.50</td>
<td>3.00</td>
<td>1.50</td>
</tr>
</tbody>
</table>

How much do you predict you would pay for 10 markers?
Find the missing value in each proportion.

1. \( \frac{24}{6} = \frac{n}{2} \)
2. \( \frac{4}{9} = \frac{20}{n} \)
3. \( \frac{n}{36} = \frac{5}{6} \)

4. \( \frac{n}{5} = \frac{4}{10} \)
5. \( \frac{3}{9} = \frac{2}{n} \)
6. \( \frac{6}{n} = \frac{3}{7} \)

7. \( \frac{5}{3} = \frac{n}{6} \)
8. \( \frac{9}{6} = \frac{6}{n} \)
9. \( \frac{2}{130} = \frac{1}{n} \)

Write a proportion for each model.

10.  

11.  

12. Shane’s neighbor pledged $1.25 for every 0.5 miles that Shane swims in the charity swim-a-thon. If Shane swims 3 miles, how much money will his neighbor donate?

13. Barbara’s goal is to practice piano 20 minutes for every 5 minutes of lessons she takes. If she takes a 20 minute piano lesson this week, how many minutes should she practice this week?
Write the correct answers.

1. The two triangles are similar. Find the missing length $x$ and the measure of $\angle A$.

2. The two triangles are similar. Find the missing length $x$ and the measure of $\angle J$.

3. The two triangles are similar. Find the missing length $x$ and the measure of $\angle N$.

4. Juanita planted two flower gardens in similar square shapes. What are the measures of all the angles in each garden? Explain how you know.
Practice

LESSON 7-5

Indirect Measurement

Write the correct answer.

1. Use similar triangles to find the height of the building. _________________

[Diagram of building with measurements 72 m, 2 m, and 6 m.]

2. Use similar triangles to find the height of the taller tree. _________________

[Diagram of tree with measurements 25 m, 3 m, and 15 m.]

3. A lamppost casts a shadow that is 35 yards long. A 3-foot-tall mailbox casts a shadow that is 5 yards long. How tall is the lamppost? _________________

4. A 6-foot-tall scarecrow in a farmer's field casts a shadow that is 21 feet long. A dog standing next to the scarecrow is 2 feet tall. How long is the dog’s shadow? _________________

5. A building casts a shadow that is 348 meters long. At the same time, a person who is 2 meters tall casts a shadow that is 6 meters long. How tall is the building? _________________

6. On a sunny day, a tree casts a shadow that is 146 feet long. At the same time, a person who is 5.6 feet tall standing beside the tree casts a shadow that is 11.2 feet long. How tall is the tree? _________________

7. In the early afternoon, a tree casts a shadow that is 2 feet long. A 4.2-foot-tall boy standing next to the tree casts a shadow that is 0.7 feet long. How tall is the tree? _________________

8. Steve's pet parakeet is 100 mm tall. It casts a shadow that is 250 mm long. A cockatiel sitting next to the parakeet casts a shadow that is 450 mm long. How tall is the cockatiel? _________________
Use the map to answer the questions.

1. On the map, the distance between Big Cypress Swamp and Lake Okeechobee is \( \frac{1}{4} \) inch. What is the actual distance?

2. On the map, the distance between Key West and Cuba is \( \frac{9}{10} \) inch. What is the actual distance?

3. Use a ruler to measure the distance between Key West and Key Largo on the map. What is the actual distance?

4. The Overseas Highway connects Key West to mainland Florida. It is 110 miles long. If it were shown on this map, how many inches long would it be?

Use the scale drawing to answer each question.

5. This scale drawing is of the lighthouse on Key West, originally built in 1825. What is the actual height of the lighthouse?

6. The original lighthouse was 66 feet tall. It was rebuilt at its present height after a hurricane destroyed it in 1846. How tall would the original lighthouse be in this scale drawing?

1 inch = 40 feet
Practice

LESSON 7.7

Percents

Write each percent as a fraction in simplest form.

1. 30%  
2. 42%  
3. 18%  

4. 35%  
5. 100%  
6. 29%  

7. 56%  
8. 70%  
9. 25%  

Write each percent as a decimal.

10. 19%  
11. 45%  
12. 3%  

13. 80%  
14. 24%  
15. 6%  

Order the percents from least to greatest.

16. 89%, 42%, 91%, 27%  
17. 2%, 55%, 63%, 31%  

18. Sarah correctly answered 84% of the questions on her math test. What fraction of the test questions did she answer correctly? Write your answer in simplest form.

19. Chloe swam 40 laps in the pool, but this was only 50% of her total swimming workout. How many more laps does she still need to swim?
Write each decimal as a percent.

1. 0.03
2. 0.92
3. 0.18
4. 0.49
5. 0.7
6. 0.09
7. 0.26
8. 0.11
9. 1.0

Write each fraction as a percent.

10. \( \frac{2}{5} \)
11. \( \frac{1}{5} \)
12. \( \frac{7}{10} \)
13. \( \frac{1}{20} \)
14. \( \frac{1}{50} \)
15. \( \frac{4}{50} \)

Compare. Write <, >, or =.

16. 60% \( \frac{2}{3} \)
17. 0.4 \( \frac{2}{5} \)
18. 0.5 \( 5\% \)
19. \( \frac{1}{100} \) \( 0.03 \)
20. \( \frac{7}{9} \) \( 72\% \)
21. \( \frac{3}{10} \) \( 35\% \)

22. Bradley completed \( \frac{3}{5} \) of his homework. What percent of his homework does he still need to complete?

23. After reading a book for English class, 100 students were asked whether or not they enjoyed it. Nine twenty-fifths of the students did not like the book. How many students liked the book?
Practice Percent Problems

Find the percent of each number.

1. 8% of 40
2. 105% of 80
3. 35% of 300
4. 13% of 66
5. 64% of 50
6. 51% of 445
7. 14% of 56
8. 98% of 72
9. 24% of 230
10. 35% of 225
11. 44% of 89
12. 3% of 114
13. 70% of 68
14. 1.5% of 300
15. 85% of 240
16. 47% of 13
17. 20% of 522
18. 2.5% of 400

19. Jenna ordered 28 shirts for her soccer team. Seventy-five percent of those shirts were size large. How many large shirts did Jenna order?

20. Douglas sold 125 sandwiches to raise money for his boy scout troop. Eighty percent of those sandwiches were sold in his neighborhood. How many sandwiches did Douglas sell in his neighborhood?

21. Samuel has run for 45 minutes. If he has completed 60% of his run, how many minutes will Samuel run in all?
Write the correct answer.

1. Carl and Rita ate breakfast at the local diner. Their bill came to $11.48. They gave their waitress a tip that was 25% of the bill. How much money did they give the waitress for her tip?

$2.87

2. The school’s goal for the charity fundraiser was $3,000. They exceeded the goal by 22%. How much money for charity did the school raise at the event?

$3,660

3. Rob had a 15% off coupon for the sporting goods store. He bought a tennis racket that had a regular ticket price of $94.00. How much did Rob spend on the racket after using his coupon?

$79.90

4. Lisa’s family ordered sandwiches to be delivered. The total bill was $21.85. They gave the delivery person a tip that was 20% of the bill. How much did they tip the delivery person?

$4.37

5. A portable CD player costs $118.26. The sales tax rate is 7%. About how much will it cost to buy the CD player?

$126.54

6. Kathy bought two CDs that each cost $14.95. The sales tax rate was 5%. About how much did Kathy pay in all?

$31.40

7. Tom bought $65.86 worth of books at the book fair. He got a 12% discount since he volunteered at the fair. About how much did Tom’s books cost after the discount?

$57.96

8. Sawyer bought a T-shirt for $12.78 and shorts for $17.97. The sales tax rate was 6%. About how much money did Sawyer spend altogether?

$32.60

9. Melody buys a skateboard that costs $79.81 and a helmet that costs $26.41. She uses a 45% off coupon on the purchase. If Melody pays with a $100 bill, about how much change should she get back?

$41.58

10. Bruce saved $35.00 to buy a new video game. The game’s original price was $42.00, but it was on sale for 30% off. The sales tax rate was 5%. Did Bruce have enough money to buy the game? Explain.

Yes; with the discount and sales tax, the total cost was $30.87.
Use the diagram to name each geometric figure.

1. two points _________
2. a plane _________
3. a line segment _________
4. a point shared by two lines _________
5. a line _________

Use the diagram to give a possible name to each figure.

6. two different ways to name the line _________
7. four different names for rays _________
8. another name for \(QP\) _________

9. Is the following statement always true, sometimes true, or never true? Explain your reasoning. A line is longer than a line segment.

10. Using endpoints as your basis, explain how a line, a line segment, and a ray are different.

Use a protractor to measure each angle.

1. 2. 3.

Use a protractor to draw an angle with each given measure.

4. 70° 5. 115° 6. 45°

Classify each angle as acute, right, obtuse, or straight.

7. 8. 9.

10. The frame for a kite has two angles that together form a right angle. What type of angle is each of those angles? Explain.

11. What kinds of angles are in each of the letters in this word? TAXI
Identify the type of each angle pair shown.

1. \( \angle 30^\circ \text{ and } \angle 30^\circ \)
2. \( \angle 50^\circ \text{ and } \angle 130^\circ \)
3. \( \angle 30^\circ \text{ and } \angle 60^\circ \)
4. \( \angle 30^\circ \text{ and } \angle 15^\circ \)

Find each unknown angle measure.

5. The angles are supplementary.

\[ \angle 2 = 120^\circ \]

6. The angles are complementary.

\[ \angle 2 = 35^\circ \]

7. Anita says the plus sign \( + \) forms 2 pairs of vertical angles.
Charles says it forms 2 pairs of congruent angles. Who is correct? Explain.

8. Is the following statement always true, sometimes true, or never true? Explain your reasoning. Two congruent angles that are complementary both measure 45°.
Classify each pair of lines.

Match each description with its correct classification.

5. \(AB\) and \(EF\) lie on the same plane and never intersect.
   - A. \(AB\) intersects \(EF\).

6. \(AB\) and \(EF\) cross each other at one common point.
   - B. \(AB \parallel EF\)

7. \(AB\) and \(EF\) lie on different planes and are neither parallel nor intersecting.
   - C. \(AB\) and \(EF\) are skew.

8. \(AB\) and \(EF\) intersect to form right angles.
   - D. \(AB \perp EF\)

9. Oak Street runs parallel to Elm Street in a flat section of town. Tom tells you to meet him at the intersection of Oak and Elm. Explain why these instructions are impossible to follow.
   - Because Oak and Elm are parallel streets on the same plane, they will never intersect.

10. Look around your classroom. Name a pair of parallel lines and a pair of perpendicular lines that you see.

   [Diagrams and lines are not represented here.]
Use the diagram to find the measure of each indicated angle.

1. $\angle CBD$_____
2. $\angle DAC$_____
3. $\angle ABC$_____
4. $\angle EBA$_____
5. $\angle ACB$_____ 

Classify each triangle using the given information.

6. The perimeter of the triangle is 30 in.  
7. The perimeter of the triangle is 15 cm.  
8. The perimeter of the triangle is 22 ft.  

9. The angles of a triangular sail measure $90^\circ$, $30^\circ$, and $60^\circ$. Its sides measure approximately 2 feet, 3.5 feet, and 4 feet. Classify the triangular shape of the sail in two different ways.

10. Two angles in one triangle are congruent to two angles in another triangle. What can you conclude about the third angle in both triangles?
Practice

Quadrilaterals

Give the most descriptive name for each figure.

1.  

2.  

3.  

4.  

5.  

6.  

Complete each statement.

7. All rectangles are also ______________.

8. A rhombus is sometimes a ______________.

9. All trapezoids are also ______________.

10. A ______________ is any plane figure with four straight sides and four angles.

11. A quadrilateral with two sets of parallel lines, but does not have 90° angles is called a ______________.

12. Devon made a table top in the shape of a quadrilateral. All of its angles measure 90°. What could the shape of Devon’s table top be?

13. The perimeter of a rhombus is 64 inches. What is the length of each side of the rhombus? Explain.

14. Explain why a trapezoid is a quadrilateral, but a quadrilateral is not always a trapezoid.
LESSON 8-7 Polygons

Name each polygon and tell whether it appears to be regular or not regular.

1.  
2.  
3.  
4.  
5.  
6.  
7. The public swimming pool is in the shape of a regular hexagon. Each side of the pool measures 5 feet. What is the distance around the entire pool?

8. In the space below, draw a regular quadrilateral. Now draw one diagonal of that quadrilateral. Describe the two polygons that are formed.
Practice

Geometric Patterns

Identify a possible pattern. Use the pattern to draw the next figure.

1. 

2. 

3. 

4. 

5. Use triangles to create a geometric pattern. Describe your pattern.
Name ___________________________ Date ______ Class ________

**Practice**

**Lesson 8-9 Congruence**

Decide whether the figures in each pair are congruent. If not, explain.

1. ![Two triangles]

2. ![Two hexagons]

3. ![Two line segments]

4. ![Two shapes]

Use the diagram for Exercises 5–7.

5. Which part of the figure is congruent to A?

6. Which part of the figure is congruent to D?

7. Which part of the figure is congruent to F?

8. Name two parts of your body that appear to be congruent.

9. Square $ABCD$ is congruent to square $FGHJ$. The total length of the sides of square $ABCD$ is 12 meters. What is the length of each side of square $FGHJ$?
Tell whether each is a translation, rotation, or reflection.

1. 2. 3.

Draw each transformation.

4. Draw a 180° clockwise rotation about the point.

5. Draw a vertical reflection across the dotted line.

6. Without using reflections, how can you get this △ to look like this ▽?

7. Describe a horizontal reflection of the word MOM. Can you think of any other words that would have a similar horizontal reflection?
Determine whether each dashed line appears to be a line of symmetry.

1. 2. 3.

Find all of the lines of symmetry in each regular polygon.

4. 5. 6.

Draw each cut-out figure as it would look unfolded.

7. 8.

9. Which has more lines of symmetry, a square or a rectangle?

10. Of the numbers 1 through 9, which numbers can have lines of symmetry?
What unit of measure provides the best estimate? Justify your answer.

1. A pair of eyeglasses is about 5 ______ long because ________________________________.

2. A chalkboard is about 4 ______ long because ________________________________.

3. A bottle of shampoo weighs about 12 ______ because ________________________________.

4. A cat weighs about 8 ______ because ________________________________.

5. An eyedropper holds about 2 ______ because ________________________________.

6. Ramon filled a watering can with water. What benchmark should he use for the capacity of the watering can?
   ________________________________

7. Estimate the length of the feather to the nearest half, fourth, or eighth inch.
   ________________________________
Practice

Understanding Metric Units of Measure

What unit of measure provides the best estimate? Justify your answer.

1. A quarter is about 2 _________ thick because

2. A pen is about 12 _________ long because

3. A tissue has a mass of about 10 _________ because

4. A brick has a mass of about 1 _________ because

5. A cereal bowl has a capacity of about 500 _________ because

6. Mia filled a pail with water. What benchmark should she use for the capacity of the pail?

7. Estimate the length of the spoon to the nearest centimeter.

---

Name ____________________ Date _________ Class _________

Holt Mathematics
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**Practice**

**Converting Customary Units**

Convert.

1. 3 yards = _____ inches
2. _____ yards = 87 feet
3. _____ cups = 104 fluid ounces
4. 4 quarts = _____ pints
5. 4 pounds = _____ ounces
6. 80 ounces = _____ pounds
7. 5 miles = _____ yards
8. _____ gallons = 48 cups
9. _____ cups = 4 pints
10. 36 inches = _____ yards

Compare. Write <, >, or =.

11. 4 quarts ______ 24 cups
12. 2.5 feet ______ 32 inches
13. 8 ounces ______ \( \frac{1}{4} \) pound
14. 5 cups ______ 40 fluid ounces
15. 56 ounces ______ 3.5 pounds
16. 2 yards ______ 5 feet
17. 1.5 miles ______ 2,500 yards
18. \( \frac{3}{2} \) tons ______ 6,000 pounds

19. Cassandra drank \( \frac{8}{12} \) cups of water during the mountain hike.
   How many fluid ounces of water did she drink?

20. Stan cut a wooden plank into 4 pieces. Each piece was 18 inches long. How long was the plank before Stan cut it?
Practice
9-4 Converting Metric Units

Convert.

1. A large thermos holds about 1.5 liters. \(1.5 \text{ L} = \phantom{0} \text{ mL}\)
2. A computer screen is about 30.75 cm wide. \(30.75 \text{ cm} = \phantom{0} \text{ mm}\)
3. A beetle weighs about 0.68 g. \(0.68 \text{ g} = \phantom{0} \text{ mg}\)
4. The distance from Dallas to Denver is 1,260 km. \(1,260 \text{ km} = \phantom{0} \text{ m}\)
5. 50 cm = \phantom{0} mm
6. 3.6 L = \phantom{0} mL
7. 6.5 kg = \phantom{0} g
8. 0.9 km = \phantom{0} m
9. 1.42 m = \phantom{0} cm
10. 12.85 mL = \phantom{0} L

Compare. Write <, >, or =.

11. 500 millimeters \(\phantom{0} 50\) centimeters
12. 6.2 liters \(\phantom{0} 620\) milliliters
13. 8.3 kilograms \(\phantom{0} 8,300\) grams
14. 2.6 meters \(\phantom{0} 26,000\) centimeters
15. An official hockey puck can weigh no more than 170 grams. What is the puck’s maximum weight in kilograms?
16. An official hockey puck is 2.54 centimeters thick. What is the official thickness of a hockey puck in millimeters?
17. An official hockey goal is 46.45 meters tall. What is the height of a hockey goal in centimeters?
18. Hockey pucks can be hit at speeds of up to 190 kilometers per hour! How many meters per hour is that?
Practice

LESSON 1.5
Time and Temperature

Convert.
1. 3 hours 10 minutes = ______ minutes
2. \(2 \frac{1}{2}\) days = ______ hours
3. 2 years 1 month = ______ months
4. 360 seconds = ______ minutes
5. 150 seconds = ______ minutes
6. 336 hours = ______ weeks
7. 5 years 6 months = ______ months
8. 86,400 seconds = ______ days
9. 2 minutes 10 seconds = ______ seconds
10. \(1 \frac{1}{2}\) days ______ minutes

Estimate the temperature.
11. 15°C is about ______ °F.
12. 4°C is about ______ °F.
13. 44°F is about ______ °C.
14. 86°F is about ______ °C.

Compare. Write <, >, or =.
15. 32 hours ______ 1 \(\frac{1}{4}\) days
16. 5 weeks ______ 840 hours
17. 3,000 seconds ______ 1 hour
18. 3 years ______ 150 weeks

19. Jackson started raking leaves at 10:20 A.M. and raked for 1 hour 55 minutes. At what time did Jackson finish raking the leaves?

20. Mia rented a movie that lasts 2 hours 5 minutes. She took a 10-minute break after watching half of the movie. Mia started to watch the movie at 11:45 A.M. When did the movie end?
Practice

Finding Angle Measures in Polygons

Use a protractor to find the measure of each angle. Then classify the angle.

1. 45°; acute
2. 105°; obtuse
3. 130°; obtuse
4. 80°; acute
5. Estimate: 0.275 Actual: 60°
6. Estimate: 120° Actual: 0.275

Estimate the measure of ∠A in each figure. Then use a protractor to check the reasonableness of your answer.

5. Estimate: __________ Actual: __________
6. Estimate: __________ Actual: __________
Find the perimeter of each figure.

1. Find each unknown measure.
   8. What is the length of side $b$ if the perimeter equals 47 in.?  
   
   9. What is the length of side $s$ if the perimeter equals 119 yd?

10. Benjamin is putting a fence around his rectangular-shaped yard. The yard is 38 feet long and 27 feet wide. How many feet of fencing does Benjamin need to surround his entire yard?

11. If you drove from Bakersville to Salem and then to San Mateo, your entire 81-mile journey would form a triangle. The distance from Salem to San Mateo is 24 miles. The distance from Bakersville to San Mateo is 40 miles. How many miles is it from Salem to Baskerville?
Use the circle to answer each question.

1. Name the circle. __________

2. Name two diameters._ ____________

3. Name four radii._ __________

Find each missing value to the nearest hundredth. Use 3.14 for $\pi$.

4. $d = 5$ in. 

5. $r = 12$ m

$C = \ __________$ 

$C = \ __________$

A gardener is putting in a circular garden. The inner circle is a vegetable garden, and the outer circle is a flower garden. Find the circumference by rounding $\pi$ to 3.

6. If the diameter of the vegetable garden is 6 feet, what is its circumference?

$C = \ __________$

7. If the radius of the flower garden is 8 feet, what is its circumference?

$C = \ __________$

8. The first Ferris wheel was built in 1893 in Chicago. Its diameter was 250 feet. How many feet did the Ferris wheel rotate with each complete turn? Use 3.14 for $\pi$.

9. Stonehenge, a circle of large carved stones in England, was built more than 1,000 years ago. The circle of stones has a diameter of 108 feet. What is the circumference of Stonehenge?
Estimate the area of each figure.

1. 

2. 

Find the area of each rectangle.

3. 

4. 

Find the area of each parallelogram.

5. 

6. 

7. Mariah is planting a rectangular rose garden. In the center of the garden, she puts a smaller rectangular patch of grass. The grass is 2 ft by 3 ft. What is the area of the rose garden?

8. A section of a stained-glass window is shaped like a parallelogram. Its base is 6.5 inches, and its height is 4 inches. How much glass is needed to cover the section completely?

9. Your rectangular yard is 10 feet wide and 26 feet long. How many square feet of grass do you need to plant if you want to cover the entire yard?
Name ___________________________ Date __________ Class __________

**Practice**

**10-2 Area of Triangles and Trapezoids**

Find the area of each triangle.

1. \[ \frac{1}{2} \times 4 \text{ yd} \times 25 \text{ yd} = 50 \text{ yd}^2 \]

2. \[ \frac{1}{2} \times 4 \text{ ft} \times 3.5 \text{ ft} = 7 \text{ ft}^2 \]

3. \[ \frac{1}{2} \times 1 \text{ cm} \times 3 \text{ cm} = 1.5 \text{ cm}^2 \]

4. \[ \frac{1}{2} \times 4 \text{ in.} \times 7 \text{ in.} = 14 \text{ in.}^2 \]

Find the area of each trapezoid.

5. \[ \frac{1}{2} \times (3 \text{ ft} + 5 \text{ ft}) \times 2 \text{ ft} = 8 \text{ ft}^2 \]

6. \[ \frac{1}{2} \times (5.5 \text{ m} + 4 \text{ m}) \times 3.1 \text{ m} = 16.25 \text{ m}^2 \]

7. \[ \frac{1}{2} \times (4 \text{ yd} + 6 \text{ yd}) \times 3 \text{ yd} = 18 \text{ yd}^2 \]

8. \[ \frac{1}{2} \times (8 \text{ cm} + 10 \text{ cm}) \times 5 \text{ cm} = 35 \text{ cm}^2 \]

9. The front part of a tent is 8 feet long and 5 feet tall. What is the area of the front part of the tent?

\[ \frac{1}{2} \times 8 \text{ ft} \times 5 \text{ ft} = 20 \text{ ft}^2 \]
Practice

Area of Composite Figures

Find the area of each polygon.

1. \[ \text{area} = \frac{1}{2} \times 2 \text{ in.} \times 3 \text{ in.} = 3 \text{ in.}^2 \]

2. \[ \text{area} = \frac{1}{2} \times 4 \text{ cm} \times 4 \text{ cm} = 8 \text{ cm}^2 \]

3. \[ \text{area} = \frac{1}{2} \times 2 \text{ ft} \times 4.5 \text{ ft} = 9 \text{ ft}^2 \]

4. \[ \text{area} = \frac{1}{2} \times 2 \text{ yd} \times 4 \text{ yd} = 4 \text{ yd}^2 \]

5. \[ \text{area} = \frac{1}{2} \times 2.5 \text{ mi} \times 6 \text{ mi} = 7.5 \text{ mi}^2 \]

6. \[ \text{area} = 6 \text{ m} 	imes 6 \text{ m} = 36 \text{ m}^2 \]

7. Three paintings are shaped like an 8-foot square, a 7-foot by 4-foot rectangle, and a triangle with a 6-foot base and a height of 7 feet. If those paintings are hung together on the outside of a building, how much of the building's wall will they cover altogether?

8. Two diagonals divide a square carpet into 4 congruent triangles. The base of each triangle is 5 feet and the height is 2.5 feet. What is the area of the entire carpet?
Write how the perimeter and the area of the figure change when its dimensions change.

1. Use a centimeter ruler to measure the triangle. Then draw another triangle with dimensions that are half as great as the given triangle. How do the perimeter and the area change when the dimensions change?

2. Nina wants to make a smaller version of a painting she saw in a museum. The museum painting was a square with each side measuring 6.4 feet. If Nina makes her copy half the size of the original painting, how much space will it cover on her wall?

3. How many feet of wood will Nina need to make a frame for her painting from Exercise 3?
Name ______________________ Date ______ Class ______

**Practice**

**10-5 Area of Circles**

Estimate the area of each circle.

1. \[ A \approx \] 5 in.

2. \[ A \approx \] 3 in.

3. \[ A \approx \] 12.2 m

4. \[ A \approx \] 100.6 ft

Find the area of each circle. Use \( \frac{22}{7} \) for \( \pi \).

5. \[ A \approx \] 2 ft

6. \[ A \approx \] 3.1 cm

7. \[ A \approx \] 10 m

8. \[ A \approx \] 28 yd

9. Stonehenge, a circle of large carved stones in England, was built more than 1,000 years ago. The circle of stones has a diameter of 108 feet. About how many square feet of land does Stonehenge cover? Use \( \frac{22}{7} \) for \( \pi \).
Identify the number of faces, edges, and vertices in each three-dimensional figure.

1. 2. 3.

Tell whether each figure is a polyhedron and name the three-dimensional figure.

4. 5. 6.

Kelly wants to make a box in the shape of a cube. How many pieces of wood does she need? In what shape should she cut them? Explain.

Kwan made a sculpture in the shape of a polyhedron. It only has one base that is a triangle. What three-dimensional figure is her sculpture? Explain your reasoning.
**Practice**

**10-7 Volume of Prisms**

Find the volume of each rectangular prism.

1. \( s = 9.5 \text{ in.} \)

2. \( 10 \text{ ft} \)
   \( 15 \text{ ft} \)
   \( 12 \text{ ft} \)

3. \( 17 \text{ yd} \)
   \( 16 \text{ yd} \)
   \( 25 \text{ yd} \)

4. \( 7.3 \text{ m} \)
   \( 6.1 \text{ m} \)
   \( 5.2 \text{ m} \)

5. \( 20 \text{ yd} \)
   \( 7 \text{ yd} \)
   \( 7 \text{ yd} \)

6. \( s = 15.2 \text{ cm} \)

Find the volume of each triangular prism.

7. \( 10 \text{ cm} \)
   \( 14 \text{ cm} \)
   \( 13 \text{ cm} \)

8. \( 9.8 \text{ ft} \)
   \( 6 \text{ ft} \)
   \( 2.5 \text{ ft} \)

9. \( 50 \text{ in.} \)
   \( 45 \text{ in.} \)

10. Fawn built a sandbox that is 6 feet long, 5 feet wide, and \( \frac{1}{2} \) foot tall. How many cubic feet of sand does she need to fill the box?

11. Unfinished lumber is sold in units called board feet. A board foot is the volume of lumber contained in a board 1 inch thick, 1 foot wide, and 1 foot long. How many cubic inches of wood are in 1 board foot?
Practice  
Volume of Cylinders

Find the volume $V$ of each cylinder to the nearest cubic unit.

1. 6 in. 12 in.

2. 4 ft 11 ft

3. 3 yd 20 yd

4. 2 m 7.5 m

5. 1.3 cm 10 cm

6. 2.7 yd 5.9 yd

7. 10 cm 13 cm

8. 16 yd 27 yd

9. 5 ft 8 ft

10. A cylindrical package of oatmeal is 20 centimeters tall. The diameter of its base is 10 centimeters. About how much oatmeal does the package hold?

11. The volume of a can is about 50.24 in$^3$. The radius of its base is 2 inches. How tall is the can?
Practice

Surface Area

Find the surface area $S$ of each prism.

1. $s = 10\text{ in.}$

2. 

Find the surface area $S$ of each pyramid.

3. 

4. 

Find the surface area $S$ of each cylinder. Use $3.14$ for $\pi$.

5. 

6. 

7. Why can you find an exact surface area measurement for a prism and pyramid but not for a cylinder?

8. The surface area of a rectangular prism is 48 square feet. The area of its front is 4 square feet, and the area of one side is 10 square feet. What is the area of the top of the prism?
Name ___________________________ Date __________ Class __________

**LESSON 11**

**Integers in Real-World Situations**

Name a positive or negative number to represent each situation.

1. depositing $85 in a bank account
2. riding an elevator down 3 floors
3. the foundation of a house sinking 5 inches
4. a temperature of 98° above zero

Graph each integer and its opposite on the number line.

-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6

5. $-2$
6. +3
7. $-5$
8. +1

9. Felix is a superintendent for an apartment building. Using the elevator, he goes from the ground floor down 1 floor to the basement to get his tools, then goes up 5 floors to fix the heater in one of the apartments, and then down 2 floors to fix the stove in another of the apartments. Write an expression to represent this situation.

10. The highest point in the state of Louisiana is Driskill Mountain. It rises 535 feet above sea level. Write the elevation of Driskill Mountain as an integer.

11. The lowest point in the state of Louisiana is New Orleans. This city's elevation is 8 feet below sea level. Write the elevation of New Orleans as an integer.
LESSON
11.2
Comparing and Ordering Integers

Use the number line to compare each pair of integers. Write < or >.

1. 10   2
   -2

2. 0   3

3. -5   0

4. -7   6

5. -6   -9

6. -8   -10

Order the integers in each set from least to greatest.

7. 5, -2, 6

8. 0, 9, -3

9. -1, 6, 1

10. -8, -9, 9

11. 15, 1, -5

12. -4, -7, -2

Order the integers in each set from greatest to least.

13. 8, -6, 4

14. -2, 1, 2

15. 0, 7, -8

16. -1, 1, 0

17. -12, 2, 1

18. -10, -12, -11

19. The lowest point in the Potomac River is 1 foot above sea level. The lowest point in the Colorado River is 70 feet above sea level. The lowest point in the Delaware River is sea level. Write the names of these three rivers in order from the lowest to the highest elevation.

20. The lowest recorded temperature in Alabama was 27°F below zero. In Florida, the lowest recorded temperature was 2°F below zero. The lowest temperature ever recorded in Hawaii was 12°F above zero. Write the names of these three states in order from the highest to the lowest recorded temperatures.
LESSON 11-3 The Coordinate Plane

Use the coordinate plane for Exercises 1–12.

Name the quadrant where each point is located.
1. D _____ 2. P ________
5. C _____ 6. X _______

Give the coordinates of each point.
7. X ________ 8. A _______
9. P ________ 10. Q _______
11. Y ________ 12. D _______

Graph each point on the coordinate plane at right.
13. X (3, 1) 14. T (−2, −2)
15. C (1, −2) 16. U (0, −3)
17. P (2, 0) 18. A (−4, −1)


20. When a point lies on the x-axis, what do you know about its y-coordinate? When a point lies on the y-axis, what do you know about its x-coordinate?
**Adding Integers**

Write the addition modeled on each number line.

1. \(+ (-2)\)
   
   \[\begin{array}{cccccccc}
   -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]

2. \(+ (-1)\)
   
   \[\begin{array}{cccccccc}
   -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]

3. \(+ 6\)
   
   \[\begin{array}{cccccccc}
   -5 & -4 & -3 & -2 & -1 & 0 & 1 & 2 & 3 & 4 & 5 \\
   \end{array}\]

Find each sum.

4. \(5 + (-1)\)
5. \(-3 + 2\)
6. \(-8 + (-4)\)

7. \(-2 + (-1)\)
8. \(9 + (-6)\)
9. \(-10 + 5\)

10. \(12 + (-3)\)
11. \(0 + (-7)\)
12. \(17 + (-9)\)

Evaluate \(n + (-1)\) for each value of \(n\).

13. \(n = 2\)
14. \(n = -4\)
15. \(n = 5\)

16. \(n = -3\)
17. \(n = 1\)
18. \(n = 0\)

19. When Calvin played golf today, he scored \(+1\) on the first hole, \(-2\) on the second hole, \(-1\) on the third, and \(+4\) on the fourth. What was Calvin's total score for the first four holes?

20. The average temperature for February was \(4\)°F below zero. By March, the average temperature had increased \(11\) degrees. What was the average temperature in March?
Write the subtraction modeled on each number line.

1. 
   \[ -3 \quad -1 \]
   \[ -5 \quad -4 \quad -3 \quad -2 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \]

2. 
   \[ +4 \quad -(-2) \]
   \[ -2 \quad 1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \]

3. 
   \[ -(-1) \]
   \[ -5 \]
   \[ -5 \quad -4 \quad -3 \quad -2 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \]

Find each difference.
4. \( 8 - (-1) \)  
5. \( -5 - 2 \)  
6. \( -10 - (-3) \)
7. \( -2 - (-1) \)  
8. \( 4 - (-6) \)  
9. \( -9 - (-5) \)
10. \( 15 - (-8) \)  
11. \( 0 - (-6) \)  
12. \( -20 - (-9) \)

Evaluate \( n - (-2) \) for each value of \( n \).
13. \( n = 2 \)  
14. \( n = -4 \)  
15. \( n = 5 \)
16. \( n = -3 \)  
17. \( n = 1 \)  
18. \( n = 0 \)

19. In a golf tournament, Sarah scored a +2 on the first round and a -4 on the second round. What was the difference between her scores on the first two rounds?

20. Washington, D.C., has an elevation of 1 foot above sea level. The elevation of New Orleans is 8 feet below sea level. What is the difference in the two cities’ elevations?
Name ___________________________ Date __________ Class __________

LESSON 11.6

**Multiplying Integers**

Write the sign of each product.

1. \(7 \cdot 8\)  
2. \(5 \cdot (-9)\)  
3. \(-4 \cdot 12\)  

4. \(-6 \cdot (-11)\)  
5. \(-3 \cdot 8\)  
6. \(-12 \cdot (-18)\)

Find each product.

7. \(5 \cdot (-7)\)  
8. \(-4 \cdot 3\)  
9. \(-8 \cdot (-2)\)  

10. \(-9 \cdot (-1)\)  
11. \(5 \cdot (-6)\)  
12. \(-10 \cdot (-4)\)

13. \(6 \cdot (-8)\)  
14. \(0 \cdot (-3)\)  
15. \(7 \cdot (-9)\)

Evaluate \(4n\) for each value of \(n\).

16. \(n = 2\)  
17. \(n = -4\)  
18. \(n = -7\)

19. \(n = -3\)  
20. \(n = 11\)  
21. \(n = 0\)

Evaluate \(-3n\) for each value of \(n\).

22. \(n = -5\)  
23. \(n = 0\)  
24. \(n = 6\)

25. \(n = -8\)  
26. \(n = 7\)  
27. \(n = -1\)

28. Last month, Tyler made five withdrawals of $25 each from his bank account and no deposits. What multiplication expression models Tyler’s bank transactions last month?

29. The Atlantic Ocean is sinking 4 inches every 100 years. Write a multiplication expression that models how much the Atlantic Ocean will sink in 300 years. How many inches will it sink in that time?
Write the sign of each quotient.

1. \( \frac{56}{8} \)  
2. \( \frac{-45}{-9} \)  
3. \( \frac{36}{-12} \)  

4. \( \frac{54}{-6} \)  
5. \( -84 \div 7 \)  
6. \( -225 \div (-15) \)

Find each quotient.

7. \( -45 \div 9 \)  
8. \( 15 \div (-3) \)  
9. \( -56 \div 8 \)  

10. \( -10 \div (-5) \)  
11. \( 28 \div (-7) \)  
12. \( -36 \div (-6) \)  

13. \( 81 \div 9 \)  
14. \( -72 \div 9 \)  
15. \( -121 \div (-11) \)

Evaluate \( \frac{n}{3} \) for each value of \( n \).

16. \( n = 6 \)  
17. \( n = -18 \)  
18. \( n = -24 \)  

19. \( n = -36 \)  
20. \( n = 30 \)  
21. \( n = -21 \)

Evaluate \( n \div 2 \) for each value of \( n \).

22. \( n = -14 \)  
23. \( n = 20 \)  
24. \( n = -24 \)  

25. \( n = 8 \)  
26. \( n = -18 \)  
27. \( n = -22 \)

28. What two division equations can you use to check the answer to the problem \( 6 \times (-4) = -24 \)?

29. Why are the rules for dividing integers similar to the rules for multiplying integers?

30. What two multiplication equations can you use to check the answer to the problem \( -32 \div 8 = -4 \)?

31. Name two integers whose product is \( -18 \) and whose quotient is \( -2 \).
Write what you should do to solve each equation.

1. \(x - 4 = -10\)
2. \(-2x = 8\)
3. \(-3 + x = 12\)
4. \(x + 6 = -9\)
5. \(-7 + x = -15\)
6. \(35 = -5x\)

Solve each equation. Check your answers.

7. \(-45 + x = -5\)
8. \(x - 9 = -1\)
9. \(36 + x = -6\)
10. \(x - 10 = -12\)
11. \(-8x = 56\)
12. \(x + 7 = -9\)
13. \(3x = -36\)
14. \(15 + x = 21\)
15. \(-4x = 64\)
16. \(x + (-3) = -5\)
17. \(x + (-12) = -5\)
18. \(x - 13 = -9\)
19. \(-7 + x = 4\)
20. \(-9x = 54\)
21. \(49 + x = -7\)
22. If you multiply a value \(x\) by \(-2\) and the product is \(-14\), what sign is the value of \(x\)? Explain.
23. You separate an amount into 3 equal groups of \(-6\). Write and solve an division equation to model this situation.
Write an equation for a function that gives the values in each table. Use the equation to find the value of $y$ for the indicated value of $x$.

1. \[
\begin{array}{c|ccccc}
  x & 1 & 2 & 3 & 4 & 5 \\
  y & 7 & 14 & 21 & 28 & \star
\end{array}
\]

2. \[
\begin{array}{c|cccc}
  x & 2 & 3 & 4 & 5 & 6 \\
  y & -3 & -2 & -1 & 0 & \star
\end{array}
\]

3. \[
\begin{array}{c|cccc}
  x & 20 & 16 & 12 & 8 & 4 \\
  y & 10 & 8 & 6 & 4 & \star
\end{array}
\]

4. \[
\begin{array}{c|cccc}
  x & 7 & 8 & 9 & 10 & 11 \\
  y & 11 & 12 & 13 & 14 & \star
\end{array}
\]

Write an equation for the function. Tell what each variable you use represents.

5. Amanda is 7 years younger than her cousin.

6. The population of North Carolina is twice as large as the population of South Carolina.

7. An Internet book company charges $7 for each paperback book, plus $2.75 for shipping and handling per order.

8. Henry records how many days he rides his bike and how far he rides each week. He rides the same distance each time. He rode 18 miles in 3 days, 24 miles in 4 days, and 42 miles in 7 days. Write an equation for the function.
Name __________________________  Date __________  Class __________

**LESSON**

**Graphing Functions**

Use the given $x$-values to write solutions of each equation as ordered pairs.

1. $y = 5x + 3$ for $x = 1, 2, 3$
2. $y = -4x$ for $x = 3, 5, 7$

Determine whether each ordered pair is a solution of the given equation.

3. $(6, 4); y = 2x - 8$
4. $(8, 72); y = x + 9$
5. $(-3, -18); y = -6x$
6. $(5, 64); y = 12x + 4$

Use the graph of the linear function to find the value of $y$ for each given value of $x$.

7. $x = 2$
8. $x = 1$
9. $x = 0$
10. $x = -1$
11. $x = -2$

Graph the function described by each equation.

12. $y = x + 1$
13. $y = 3 - x$
Write impossible, unlikely, as likely as not, likely, or certain to describe each event.

1. landing on blue
2. landing on green
3. landing on red
4. landing on blue or red
5. You will spin the spinner clockwise.

Write each probability as a decimal and as a fraction.

6. There is a 10% chance of rain tomorrow.
7. There is a 75% chance of snow tomorrow.
8. There is a 25% chance of hail tomorrow.

Compare probabilities.
9. Are you more likely to win a color TV or a watch?
10. Are you more likely to win a DVD player or a stereo?
11. Are you more likely to win a diamond ring, a DVD player, or a stereo?

12. A bag has 4 red marbles, 3 blue marbles, 4 green marbles, and 1 black marble. Which term best describes the probability of picking a black marble from the bag: impossible, likely, as likely as not, unlikely, or impossible?

<table>
<thead>
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<th>Prize Winning Probabilities</th>
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<td>Color TV</td>
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<td>Stereo</td>
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<td>Diamond ring</td>
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</table>
For each experiment, identify the outcome shown.

1. 2.

outcome: outcome:

Amanda has a standard deck of playing cards. She picked one card, recorded the suit, and placed it back in the deck. She repeated this process several times and recorded her results in the table.

3. Find the experimental probability that a card selected from the deck will be a spade.

4. Find the experimental probability that a card selected from the deck will be a diamond.

5. Based on Amanda’s experiment, which card suit is she most likely to select from the deck?

6. Based on Amanda’s experiment, which card suit is she least likely to select from the deck?

7. In 28 coin tosses, John got tails up 14 times. What is the experimental probability that John will get tails up on his next toss?
1. Brian wants to buy a new bicycle. He can choose a 10-speed or 3-speed bike. The bikes come in red, blue, black, and purple. How many different bikes can Brian choose from?

8 different bikes

2. Mr. Simon can leave for Miami on Monday, Tuesday, or Wednesday. He can fly, drive, or take a train. How many different travelling options does Mr. Simon have?

9 different options

3. The marching band is choosing new uniforms. They can select black or white pants. They can choose a blue, red, green, or black shirt. From how many different uniforms can the band choose?

8 different uniforms

4. Sara, Jimmy, and Chantall are sitting beside one another on a bench. In how many different orders could they possibly be sitting from left to right?

6 different orders
Practice

12-4 Theoretical Probability

Find the probability of each event using the spinner.

1. landing on blue __________
2. landing on red __________
3. landing on green __________
4. NOT landing on blue __________

Find the probability of each event using the bag of marbles.

5. picking a black marble __________
6. picking a striped marble __________
7. picking a white marble __________
8. NOT picking a white marble __________

A standard number cube is rolled. Find each probability.

9. \( P(2) \) __________
10. \( P(\text{even number}) \) __________
11. \( P(4 \text{ or } 5) \) __________
12. \( P(\text{odd number}) \) __________

13. Out of 10 fair coin tosses, a coin landed tails up 4 times. How does this experimental probability of a fair coin landing tails up compare to the theoretical probability of the same event?

14. The probability of a spinner landing on blue is \( \frac{3}{4} \). What is the probability of it NOT landing on blue written as a percent?
Name ___________________________ Date _______ Class _______

**LESSON 12.6**  
**Compound Events**

This spinner is spun twice.

1. What is the probability of the spinner landing on \( B \) both times?

2. What is the probability of the spinner landing on \( B \), then \( C \)?

3. What is the probability of the spinner landing on a vowel and then a consonant?

4. What is the probability of NOT spinning \( D \) either time?

A coin is tossed three times.

5. How many possible outcomes are there?

6. What is the probability of the coin landing heads up three times?

7. What is the probability of the coin landing heads up twice and tails up once?

There are five cards numbered 1, 2, 3, 4, and 5 in a bag. Each time a card is drawn, it is replaced. Find each probability.

8. \( P(1, \text{ then } 2) \)

9. \( P(4, \text{ then } 4) \)

10. \( P(\text{even, then odd}) \)

11. \( P(\text{odd, then odd}) \)

12. What is the probability of a coin landing on heads and a number cube landing on an even number?
Use the sample survey to make predictions.

1. If you randomly selected a person, what is the probability that his or her favorite sport is basketball?

2. In a group of 200 people, how many do you predict would choose baseball as their favorite sport?

3. In a class of 45 students, how many students do you predict would choose soccer as their favorite sport?

4. In a group of 100 people, how many do you predict would choose hockey as their favorite sport?

5. Based on a sample survey, a local newspaper states that 75% of all the city’s voters turned out for the city council elections. If you randomly selected 200 people in that city, how many do you predict would have voted in the election?

6. If you roll a fair number cube 30 times, how many times would you expect to roll an odd number?

7. Based on a sample survey, a company claims that 8% of its customers were unhappy with the DVD players they bought. If the company sold DVD players to 2,000 people last year, how many of those customers do you predict were unhappy with their DVDs?

8. If you toss a fair coin 48 times, how many times do you predict it will land tails up?