Includes:

- Standards of Learning for Grade 7
- Mathematics Formula Sheet
- Student Recording Chart
- Diagnostic Test
- Numerous Practice Questions for Each SOL
- Full-Size Sample Test
Test-Taking Tips

• Go to bed early the night before the test. You will think more clearly after a good night's rest.

• Read each problem carefully and think about ways to solve the problem before you try to answer the question.

• Relax. Most people get nervous when taking a test. It's natural. Just do your best.

• Answer questions you are sure about first. If you do not know the answer to a question, skip it and go back to that question later.

• Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.

• If no figure is provided, draw one. If one is furnished, mark it up to help you solve the problem.

• When you have finished each problem, reread it to make sure your answer is reasonable.

• Become familiar with a variety of formulas and when they should be used.

• Make sure that the number of the question on the answer sheet matches the number of the question on which you are working in your test booklet.
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**Test Practice**

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Overview

The material in this booklet is designed to help you prepare for the Virginia Standards of Learning (SOL) Assessment for Grade 7.

It contains:

• a Student Recording Chart,
• the Virginia Standards of Learning, Grade 7, correlated to *Glencoe Mathematics: Applications and Concepts*, Course 2, and *Glencoe Pre-Algebra*,
• a Formula Sheet,
• a Diagnostic Test,
• practice for each SOL, and
• a Sample Test.

How to Use This Book

**Diagnostic Test**  This test will help you identify any weaknesses you may have as you prepare to take the SOL. Once you’ve taken the test and it’s been graded, complete the Student Recording Chart that is found on page v. Mark an × in the square for each question that you answered *incorrectly*.

**Practice**  If you missed one or two of the questions for a particular SOL, you could probably use some extra practice with that standard. The Student Recording Chart lists practice pages for each SOL. Complete the appropriate practice pages. If you are unsure about how to do some of the problems, you may want to refer to your mathematics book.

**Sample Test**  After you have completed your practice worksheet(s), take the Sample Test on pages 53 to 62.
Student Recording Chart

**Directions** Mark an × by each question from the Diagnostic Test that you answered *incorrectly*. If there are one or two ×s marked for a SOL, write **Yes** in the *Need Practice?* box. Then complete the practice pages for that standard.

<table>
<thead>
<tr>
<th>Standard</th>
<th>7.1</th>
<th>7.2</th>
<th>7.3a</th>
<th>7.3b</th>
<th>7.3c</th>
<th>7.3d</th>
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<tbody>
<tr>
<td>Test Questions</td>
<td>[ ] 4</td>
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<td>[ ] 17</td>
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<td>Need Practice?</td>
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</tr>
<tr>
<td>Practice Pages</td>
<td>11–12</td>
<td>12–13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
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<table>
<thead>
<tr>
<th>Standard</th>
<th>7.3e</th>
<th>7.4a</th>
<th>7.4b</th>
<th>7.5</th>
<th>7.6</th>
<th>7.7a</th>
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<tr>
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<td>1</td>
<td>21</td>
<td>23</td>
<td>9</td>
<td>45</td>
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<td>Need Practice?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice Pages</td>
<td>18</td>
<td>18–19</td>
<td>19–20</td>
<td>20–21</td>
<td>22–23</td>
<td>23–24</td>
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<thead>
<tr>
<th>Standard</th>
<th>7.7b</th>
<th>7.8</th>
<th>7.9</th>
<th>7.10</th>
<th>7.11</th>
<th>7.12</th>
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<td>15</td>
<td>49</td>
<td>6</td>
<td>31</td>
<td>18</td>
</tr>
<tr>
<td>Need Practice?</td>
<td></td>
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<table>
<thead>
<tr>
<th>Standard</th>
<th>7.13</th>
<th>7.14</th>
<th>7.15</th>
<th>7.16</th>
<th>7.17a</th>
<th>7.17b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Questions</td>
<td>16</td>
<td>46</td>
<td>12</td>
<td>33</td>
<td>14</td>
<td>42</td>
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<td>Need Practice?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Practice Pages</td>
<td>33–34</td>
<td>34–35</td>
<td>36–37</td>
<td>37–38</td>
<td>39</td>
<td>40</td>
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<table>
<thead>
<tr>
<th>Standard</th>
<th>7.17c</th>
<th>7.17d</th>
<th>7.17e</th>
<th>7.17f</th>
<th>7.18</th>
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<tbody>
<tr>
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<td>36</td>
<td>47</td>
<td>10</td>
<td>27</td>
<td>19</td>
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<tr>
<td>Need Practice?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice Pages</td>
<td>41</td>
<td>42</td>
<td>43</td>
<td>44</td>
<td>45–46</td>
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</table>

<table>
<thead>
<tr>
<th>Standard</th>
<th>7.19</th>
<th>7.20</th>
<th>7.21</th>
<th>7.22a</th>
<th>7.22b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Questions</td>
<td>7</td>
<td>32</td>
<td>22</td>
<td>37</td>
<td>11</td>
</tr>
<tr>
<td>Need Practice?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice Pages</td>
<td>46–47</td>
<td>48–49</td>
<td>49–50</td>
<td>51</td>
<td>52</td>
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</tbody>
</table>
Virginia Standards of Learning, Grade 7, Correlated to *Glencoe Mathematics: Applications and Concepts, Course 2*

Lessons in which the standards are a primary focus are indicated in **bold**.

<table>
<thead>
<tr>
<th>Standards of Learning</th>
<th>Student Edition Lesson(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number and Number Sense</strong></td>
<td></td>
</tr>
<tr>
<td><strong>7.1</strong> The student will compare, order, and determine</td>
<td></td>
</tr>
<tr>
<td>equivalent relationships between fractions, decimals, and</td>
<td></td>
</tr>
<tr>
<td>percents, including use of scientific notation for</td>
<td>1-9, 5-4, 5-5, 5-6,</td>
</tr>
<tr>
<td>numbers greater than 10.</td>
<td>5-8, 7-5, 7-6</td>
</tr>
<tr>
<td><strong>7.2</strong> The student will simplify expressions that</td>
<td></td>
</tr>
<tr>
<td>contain rational numbers (whole numbers, fractions, and</td>
<td>1-2, 1-3, 1-4, 1-5</td>
</tr>
<tr>
<td>decimals) and positive exponents, using order of</td>
<td></td>
</tr>
<tr>
<td>operations, mental mathematics, and appropriate tools.</td>
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</tr>
<tr>
<td><strong>7.3</strong> The student will identify and apply the</td>
<td></td>
</tr>
<tr>
<td>following properties of operations with real numbers:</td>
<td></td>
</tr>
<tr>
<td>(a) the commutative and associative properties for</td>
<td>1-6</td>
</tr>
<tr>
<td>addition and multiplication;</td>
<td></td>
</tr>
<tr>
<td>(b) the distributive property;</td>
<td>1-6</td>
</tr>
<tr>
<td>(c) the additive and multiplicative identity properties;</td>
<td>1-6</td>
</tr>
<tr>
<td>(d) the additive and multiplicative inverse properties;</td>
<td>3-4, 6-5</td>
</tr>
<tr>
<td>and</td>
<td></td>
</tr>
<tr>
<td>(e) the multiplicative property of zero.</td>
<td>3-6</td>
</tr>
<tr>
<td><strong>Computation and Estimation</strong></td>
<td></td>
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<tr>
<td><strong>7.4</strong> The student will</td>
<td></td>
</tr>
<tr>
<td>(a) solve practical problems using rational numbers</td>
<td>5-3, 5-4, 5-5, 5-6, 7-5,</td>
</tr>
<tr>
<td>(whole numbers, fractions, decimals) and percents; and</td>
<td>7-6, 7-7, 7-8, 8-1,</td>
</tr>
<tr>
<td></td>
<td>8-2, 8-4, 8-5, 8-6</td>
</tr>
<tr>
<td>(b) solve consumer-application problems involving</td>
<td>7-8, 8-1b, 8-2, 8-4,</td>
</tr>
<tr>
<td>tips, discounts, sales tax, and simple interest.</td>
<td>8-5, 8-6, 8-6b</td>
</tr>
<tr>
<td><strong>7.5</strong> The student will formulate rules for and solve</td>
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</tr>
<tr>
<td>practical problems involving basic operations (addition,</td>
<td>3-4a, 3-4, 3-5a, 3-5,</td>
</tr>
<tr>
<td>subtraction, multiplication, and division) with</td>
<td>3-6, 3-7</td>
</tr>
<tr>
<td>integers.</td>
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<tr>
<td><strong>7.6</strong> The student will use proportions to solve</td>
<td></td>
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<tr>
<td>practical problems, which may include scale drawings,</td>
<td>7-3, 7-3b, 7-4, 7-8</td>
</tr>
<tr>
<td>that contain rational numbers (whole numbers, fractions,</td>
<td></td>
</tr>
<tr>
<td>and decimals) and percents.</td>
<td></td>
</tr>
</tbody>
</table>

PS = Prerequisite Skill
<table>
<thead>
<tr>
<th>Standards of Learning</th>
<th>Student Edition Lesson(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measurement</strong></td>
<td></td>
</tr>
<tr>
<td>7.7 The student</td>
<td></td>
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<tr>
<td><strong>(a)</strong> given</td>
<td>11-7</td>
</tr>
<tr>
<td>appropriate</td>
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<tr>
<td>dimensions, will</td>
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<tr>
<td>estimate and</td>
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<tr>
<td>find the area</td>
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<td>of polygons by</td>
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<tr>
<td>subdividing them</td>
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<tr>
<td>into rectangles and</td>
<td></td>
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<tr>
<td>right</td>
<td></td>
</tr>
<tr>
<td>triangles; and</td>
<td></td>
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<tr>
<td><strong>(b)</strong> will apply</td>
<td></td>
</tr>
<tr>
<td>perimeter and area</td>
<td>6-8, 11-4, 11-5, 11-6,</td>
</tr>
<tr>
<td>formulas in practical situations.</td>
<td>11-7</td>
</tr>
<tr>
<td>7.8 The student will investigate and solve problems involving the</td>
<td>12-2, 12-2b, 12-3,</td>
</tr>
<tr>
<td>volume and surface area of rectangular prisms and cylinders,</td>
<td>12-4a, 12-4, 12-4b,</td>
</tr>
<tr>
<td>using concrete materials and practical situations to develop</td>
<td>12-5</td>
</tr>
<tr>
<td>formulas.</td>
<td></td>
</tr>
<tr>
<td><strong>Geometry</strong></td>
<td></td>
</tr>
<tr>
<td>7.9 The student will compare and contrast the following</td>
<td>10-5</td>
</tr>
<tr>
<td>quadrilaterals:</td>
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<tr>
<td>parallelogram,</td>
<td></td>
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<tr>
<td>rectangle, square,</td>
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<tr>
<td>rhombus, and trapezoid. Deductive reasoning and inference will be used to</td>
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<tr>
<td>classify quadrilaterals.</td>
<td></td>
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<tr>
<td>7.10 The student will identify and draw the following polygons:</td>
<td>10-7</td>
</tr>
<tr>
<td>pentagon, hexagon,</td>
<td></td>
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<tr>
<td>heptagon, octagon,</td>
<td></td>
</tr>
<tr>
<td>nonagon, and decagon.</td>
<td></td>
</tr>
<tr>
<td>7.11 The student will determine if geometric figures—quadrilaterals</td>
<td>10-6</td>
</tr>
<tr>
<td>and triangles—are similar and write proportions to express the</td>
<td></td>
</tr>
<tr>
<td>relationships between corresponding parts of similar figures.</td>
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</tr>
<tr>
<td>7.12 The student will identify and graph ordered pairs in the four</td>
<td>3-3, 4-6a</td>
</tr>
<tr>
<td>quadrants of a coordinate plane.</td>
<td></td>
</tr>
<tr>
<td>7.13 The student, given a polygon in the coordinate plane, will</td>
<td>10-8, 10-9b</td>
</tr>
<tr>
<td>represent transformations — rotation and translation — by graphing the coordinates of the vertices of the transformed</td>
<td></td>
</tr>
<tr>
<td>polygon and sketching the resulting figure.</td>
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</tr>
<tr>
<td><strong>Probability and Statistics</strong></td>
<td></td>
</tr>
<tr>
<td>7.14 The student will investigate and describe the difference between</td>
<td>9-6, 9-6b</td>
</tr>
<tr>
<td>the probability of an event found through simulation versus the</td>
<td></td>
</tr>
<tr>
<td>theoretical probability of that same event.</td>
<td></td>
</tr>
<tr>
<td>7.15 The student will identify and describe the number of possible</td>
<td>9-2, 9-3, 9-4, 9-5</td>
</tr>
<tr>
<td>arrangements of several objects, using a tree diagram or the</td>
<td></td>
</tr>
<tr>
<td>Fundamental (Basic) Counting Principle.</td>
<td></td>
</tr>
<tr>
<td>7.16 The student will create and solve problems involving the</td>
<td>2-3, 2-4, 2-4b, 2-5,</td>
</tr>
<tr>
<td>measures of central tendency (mean, median, mode) and the</td>
<td>2-6, 2-8</td>
</tr>
<tr>
<td>range of a set of data.</td>
<td></td>
</tr>
<tr>
<td>Standards of Learning</td>
<td>Student Edition Lesson(s)</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>7.17</strong> The student, given a problem situation, will collect, analyze, display, and interpret data, using a variety of graphical methods, including: (a) frequency distributions;</td>
<td>2-1, 2-2a, 2-2, 2-3, 2-4, 2-4b, 2-5, 2-6, 2-7, 2-7b, 2-8</td>
</tr>
<tr>
<td>(b) line plots;</td>
<td>2-3</td>
</tr>
<tr>
<td>(c) histograms;</td>
<td>2-7</td>
</tr>
<tr>
<td>(d) stem-and-leaf plots;</td>
<td>2-5</td>
</tr>
<tr>
<td>(e) box-and-whisker plots; and</td>
<td>2-6</td>
</tr>
<tr>
<td>(f) scattergrams.</td>
<td>2-2</td>
</tr>
<tr>
<td><strong>7.18</strong> The student will make inferences, conjectures, and predictions based on analysis of a set of data.</td>
<td>2-2a, 2-2, 4-6a, 8-3a, 8-3</td>
</tr>
</tbody>
</table>

**Patterns, Functions, and Algebra**

| **7.19** The student will represent, analyze, and generalize a variety of patterns, including arithmetic sequences and geometric sequences, with tables, graphs, rules, and words in order to investigate and describe functional relationships. | 1-1, 1-7, 1-7b, 3-6a, 4-6a, 4-6 |
| **7.20** The student will write verbal expressions as algebraic expressions and sentences as equations. | 4-1, 4-6 |
| **7.21** The student will use the following algebraic terms appropriately: equation, inequality, and expression. | 1-4, 1-5, 4-1, 4-2, 4-3, 4-5 |
| **7.22** The student will (a) solve one-step linear equations and inequalities in one variable with strategies involving inverse operations and integers, using concrete materials, pictorial representations, and paper and pencil; and | 1-5, 4-2a, 4-2, 4-3, 4-5 |
| (b) solve practical problems requiring the solution of a one-step linear equation. | 1-5, 4-2, 4-3, 4-5 |
### Virginia Standards of Learning, Grade 7, Correlated to *Glencoe Pre-Algebra*

Lessons in which the standards are a primary focus are indicated in **bold**.

<table>
<thead>
<tr>
<th>Standards of Learning</th>
<th>Student Edition Lesson(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number and Number Sense</strong></td>
<td></td>
</tr>
<tr>
<td><strong>7.1</strong> The student will compare, order, and determine equivalent relationships between fractions, decimals, and percents, including use of scientific notation for numbers greater than 10.</td>
<td>4-8, 5-1, 5-2, 5-6, 6-2, 6-4, 6-5P, 9-2</td>
</tr>
<tr>
<td><strong>7.2</strong> The student will simplify expressions that contain rational numbers (whole numbers, fractions, and decimals) and positive exponents, using order of operations, mental mathematics, and appropriate tools.</td>
<td>1-2, 1-3F, 1-4, 2-2, 2-3, 2-4, 2-5, 3-1, 4-2, 4-5, 4-6, 5-3, 5-4, 5-5, 5-7, 5-9, 9-1</td>
</tr>
<tr>
<td><strong>7.3</strong> The student will identify and apply the following properties of operations with real numbers: <em>(a)</em> the commutative and associative properties for addition and multiplication; <em>(b)</em> the distributive property; <em>(c)</em> the additive and multiplicative identity properties; <em>(d)</em> the additive and multiplicative inverse properties; and <em>(e)</em> the multiplicative property of zero.</td>
<td>1-4, 2-2, 2-4, 3-2, 3-3, 3-6, 4-6, 3-1, 3-2, 3-7, 4-1, 4-4, 7-2, 1-4, 3-2, 3-3, 3-4, 3-5, 2-2, 3-3, 5-4, 1-4</td>
</tr>
<tr>
<td><strong>Computation and Estimation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>7.4</strong> The student will <em>(a)</em> solve practical problems using rational numbers (whole numbers, fractions, decimals) and percents; and <em>(b)</em> solve consumer-application problems involving tips, discounts, sales tax, and simple interest.</td>
<td>5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-9, 6-1, 6-2, 6-4, 6-5, 6-6, 6-7, 6-7F, 6-8, 6-6, 6-7, 6-7F</td>
</tr>
<tr>
<td><strong>7.5</strong> The student will formulate rules for and solve practical problems involving basic operations (addition, subtraction, multiplication, and division) with integers.</td>
<td>1-2, 1-3, 1-4, 1-5, 2-1, 2-2P, 2-2, 2-3, 2-4, 2-5, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-7F, 4-1, 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 6-5, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 9-4, 9-5, 9-7, 10-1, 10-5, 10-8, 11-1, 11-2, 11-4, 11-6, 12-6, 12-7, 13-2, 13-3, 13-4, 13-5, 13-6</td>
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</tbody>
</table>

P = Preview Lesson, F = Follow-Up Lesson, RM = Reading Math
<table>
<thead>
<tr>
<th><strong>Standards of Learning</strong></th>
<th><strong>Student Edition Lesson(s)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>7.6 <strong>The student will use proportions to solve practical problems, which may include scale drawings, that contain rational numbers (whole numbers, fractions, and decimals) and percents.</strong></td>
<td>6-2, 6-2F, 6-3, 6-5</td>
</tr>
<tr>
<td><strong>Measurement</strong></td>
<td></td>
</tr>
<tr>
<td>7.7 <strong>The student</strong> (a) <strong>given appropriate dimensions, will estimate and find the area of polygons by subdividing them into rectangles and right triangles; and</strong></td>
<td>10-5P, 10-5, 10-8</td>
</tr>
<tr>
<td><strong>(b) will apply perimeter and area formulas in practical situations.</strong></td>
<td>3-7, 7-2, 8-9, 10-5, 10-6, 10-7, 10-8</td>
</tr>
<tr>
<td>7.8 <strong>The student will investigate and solve problems involving the volume and surface area of rectangular prisms and cylinders, using concrete materials and practical situations to develop formulas.</strong></td>
<td>11-2P, 11-2, 11-4, 11-6P, 11-6</td>
</tr>
<tr>
<td><strong>Geometry</strong></td>
<td></td>
</tr>
<tr>
<td>7.9 <strong>The student will compare and contrast the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. Deductive reasoning and inference will be used to classify quadrilaterals.</strong></td>
<td>10-4</td>
</tr>
<tr>
<td>7.10 <strong>The student will identify and draw the following polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon.</strong></td>
<td>10-6</td>
</tr>
<tr>
<td>7.11 <strong>The student will determine if geometric figures—quadrilaterals and triangles—are similar and write proportions to express the relationships between corresponding parts of similar figures.</strong></td>
<td>9-7, 10-3F, 11-6</td>
</tr>
<tr>
<td>7.12 <strong>The student will identify and graph ordered pairs in the four quadrants of a coordinate plane.</strong></td>
<td>1-6, 2-6</td>
</tr>
<tr>
<td>7.13 <strong>The student, given a polygon in the coordinate plane, will represent transformations — rotation and translation — by graphing the coordinates of the vertices of the transformed polygon and sketching the resulting figure.</strong></td>
<td>10-3</td>
</tr>
<tr>
<td><strong>Probability and Statistics</strong></td>
<td></td>
</tr>
<tr>
<td>7.14 <strong>The student will investigate and describe the difference between the probability of an event found through simulation versus the theoretical probability of that same event.</strong></td>
<td>6-9, 6-9F</td>
</tr>
<tr>
<td>7.15 <strong>The student will identify and describe the number of possible arrangements of several objects, using a tree diagram or the Fundamental (Basic) Counting Principle.</strong></td>
<td>12-6</td>
</tr>
<tr>
<td>Standards of Learning</td>
<td>Student Edition Lesson(s)</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>7.16</strong> The student will create and solve problems involving the measures of central</td>
<td>5-8, 5-8F, 12-2</td>
</tr>
<tr>
<td>tendency (mean, median, mode) and the range of a set of data.</td>
<td></td>
</tr>
<tr>
<td><strong>7.17</strong> The student, given a problem situation, will collect, analyze, display,</td>
<td>12-4</td>
</tr>
<tr>
<td>and interpret data, using a variety of graphical methods, including:</td>
<td></td>
</tr>
<tr>
<td>(a) frequency distributions;</td>
<td></td>
</tr>
<tr>
<td>(b) line plots;</td>
<td>5-8</td>
</tr>
<tr>
<td>(c) histograms;</td>
<td>12-4, 12-4F</td>
</tr>
<tr>
<td>(d) stem-and-leaf plots;</td>
<td>12-1</td>
</tr>
<tr>
<td>(e) box-and-whisker plots; and</td>
<td>12-3, 12-3F</td>
</tr>
<tr>
<td>(f) scattergrams.</td>
<td>1-7P, 1-7, 1-7F</td>
</tr>
<tr>
<td><strong>7.18</strong> The student will make inferences, conjectures, and predictions based on</td>
<td>1-7P, 1-7, 3-7F, 5-10F,</td>
</tr>
<tr>
<td>analysis of a set of data.</td>
<td>6-2F, 6-7F, 6-9, 8-4P,</td>
</tr>
<tr>
<td></td>
<td>8-5P, 8-5, 8-8, 9-8P,</td>
</tr>
<tr>
<td></td>
<td>11-2, 11-6P</td>
</tr>
</tbody>
</table>

**Patterns, Functions, and Algebra**

<table>
<thead>
<tr>
<th>Standards of Learning</th>
<th>Student Edition Lesson(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7.19</strong> The student will represent, analyze, and generalize a variety of patterns,</td>
<td>5-10, 8-1, 8-2P, 8-2,</td>
</tr>
<tr>
<td>including arithmetic sequences and geometric sequences, with tables, graphs, rules,</td>
<td>RM8, 8-3, 8-5, 8-6,</td>
</tr>
<tr>
<td>and words in order to investigate and describe functional relationships.</td>
<td>8-6F, 8-7, 13-5, 13-6,</td>
</tr>
<tr>
<td></td>
<td>13-6F</td>
</tr>
<tr>
<td><strong>7.20</strong> The student will write verbal expressions as algebraic expressions and</td>
<td>1-3, 1-5, 3-2, 3-4,</td>
</tr>
<tr>
<td>sentences as equations.</td>
<td>RM3, 3-6, 8-7</td>
</tr>
<tr>
<td><strong>7.21</strong> The student will use the following algebraic terms appropriately:</td>
<td>1-2, 1-5, 2-1, 4-2, 7-3</td>
</tr>
<tr>
<td>equation, inequality, and expression.</td>
<td></td>
</tr>
<tr>
<td><strong>7.22</strong> The student will</td>
<td></td>
</tr>
<tr>
<td>(a) solve one-step linear equations and inequalities in one variable with</td>
<td>1-5, 3-3 and 3-4P,</td>
</tr>
<tr>
<td>strategies involving inverse operations and integers, using concrete materials,</td>
<td>3-3, 3-4, 3-7, 5-9,</td>
</tr>
<tr>
<td>pictorial representations, and paper and pencil; and</td>
<td>7-4, 7-5</td>
</tr>
<tr>
<td>(b) solve practical problems requiring the solution of a one-step linear equation.</td>
<td>3-3, 3-4, 3-7, 5-9</td>
</tr>
</tbody>
</table>
Commonly Used Formulas

Perimeter, Area, and Circumference

**square**

\[ p = 4s \]
\[ A = s^2 \]

**rectangle**

\[ p = 2l + 2w \]
\[ A = lw \]

**parallelogram**

\[ A = bh \]

**triangle**

\[ A = \frac{1}{2}bh \]

**trapezoid**

\[ A = \frac{1}{2}h(b_1 + b_2) \]

Volume and Surface Area

**rectangular prism**

\[ V = \ell \cdot w \cdot h \]
\[ S.A. = 2lw + 2\ell h + 2wh \]

**cylinder**

\[ V = \pi r^2h \]
\[ S.A. = 2\pi rh + 2\pi r^2 \]

**pyramid**

\[ V = \frac{1}{3}Bh \]
\[ S.A. = \frac{1}{2}(p + B) \]

**cone**

\[ V = \frac{1}{3}\pi r^2h \]
\[ S.A. = \pi rl + \pi r^2 \]

Pythagorean Theorem

**right triangle**

\[ c^2 = a^2 + b^2 \]
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 Lauren expects $\frac{4}{5}$ of her hyacinths to flower. If she planted 150 hyacinths, how many flowers does she expect? 7.4a
   A 40
   B 50
   C 100
   D 120

2 Which two figures are similar? 7.11
   F 1 and 2
   G 2 and 3
   H 2 and 4
   J 1 and 3

3 A baseball team had the following scores for one season: 15, 7, 5, 8, 5, 6, 5, 5, 2, 3
   What is the mean score for the team? 7.16
   A 61
   B 50
   C 6.1
   D 5

4 Which value is equivalent to 10.5714285714? 7.1
   F 10.57%
   G 1,057.14%
   H $10\frac{4}{7}$
   J $1.057 \times 10^3$

5 What is the area of the trapezoid? 7.7b
   A 128 in$^2$
   B 134 in$^2$
   C 151 in$^2$
   D 240 in$^2$
6 Which characteristic distinguishes a trapezoid from a rhombus? 7.9
   F only 1 pair of parallel sides
   G 4 congruent sides
   H 4 parallel sides
   J 2 right angles

7 Which table shows the function \( y = \frac{2}{3}x + 3 \)? 7.19
   A \[
   \begin{array}{c|cc|c}
   x & -3 & 0 & 3 \\
   y & 5 & 3 & 1 \\
   \end{array}
   \]
   B \[
   \begin{array}{c|cc|c}
   x & -3 & 0 & 3 \\
   y & 1 & 3 & 5 \\
   \end{array}
   \]
   C \[
   \begin{array}{c|cc|c}
   x & -3 & 0 & 3 \\
   y & -8 & 2 & 9 \\
   \end{array}
   \]
   D \[
   \begin{array}{c|cc|c}
   x & -3 & 0 & 3 \\
   y & 9 & 2 & 15 \\
   \end{array}
   \]

8 What is the solution to \( x + 8 < 15 \)? 7.22a
   F \( x < 22 \)
   G \( x > \frac{15}{8} \)
   H \( x > 9 \)
   J \( x < 7 \)

9 The art club is creating a scale model of the school. If the school is 22 feet tall and the scale they choose to create the model is 1 inch:2 feet, determine how tall the model will be. 7.6
   A 4 ft
   B 11 in.
   C 11 ft
   D 44 in.

10 According to the box-and-whisker plot, what is the range of the data? 7.17e
   \[
   \begin{array}{cc}
   2 & 8 \quad 10 \quad 17 \quad 21 \\
   \end{array}
   \]
   F 9
   G 10
   H 17
   J 19

11 A mathematical sentence with a range of solutions describes which term? 7.21
   A equation
   B expression
   C inequality
   D equality
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

12 Marcus has a spinner and is testing whether or not it is a fair spinner. He spins the spinner 15 times and records his results in the table. Which statement best describes what Marcus can conclude from his experiment?  

<table>
<thead>
<tr>
<th>Color</th>
<th>Number of Spins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>2</td>
</tr>
<tr>
<td>Blue</td>
<td>4</td>
</tr>
<tr>
<td>Green</td>
<td>5</td>
</tr>
<tr>
<td>Yellow</td>
<td>4</td>
</tr>
</tbody>
</table>

F) Not enough trials were performed to determine whether or not the spinner is fair.
G) The experimental and theoretical probabilities are very close, so the experiment proves the spinner is fair.
H) Red has the same experimental and theoretical probability, so the spinner is fair.
J) Green and yellow have experimental probabilities that are higher than the theoretical probabilities, so the spinner is not fair.

13 Which equation illustrates the distributive property?  

A) $2(7 - 8) = 2(7) + 2(8)$
B) $2(7 - 8) = 2(-1)$
C) $2(7 - 8) = 14 + 2(-8)$
D) $2(7 - 8) = 2(7) + 2(8)$

14 Shenandoah National Park has 500 miles of hiking trails, 150 miles of horse trails, and 22 streams open for harvest fishing. How many possible arrangements are there if you choose to hike 1 mile, horseback ride 1 mile, and fish in 1 stream?  

F) 672
G) 75,022
H) 1,564,500
J) 1,650,000

15 A container of tennis balls is shown. What is the approximate volume of the container?  

A) $595 \text{ cm}^3$
B) $950 \text{ cm}^3$
C) $1,367 \text{ cm}^3$
D) $3,800 \text{ cm}^3$
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

16 What transformation of polygon \(ABCD\) produces \(A'B'C'D'\)?
- \(F\) a 90° clockwise rotation
- \(G\) a 270° counter-clockwise rotation
- \(H\) a translation 4 units down and 2 units left
- \(J\) a translation 2 units up and 4 units right

17 Simplify the expression \(\frac{4}{3} + 4\left(\frac{2}{4}\right) + 3\left(\frac{5}{3}\right) + \left(\frac{1}{2}\right)^2\). 
- \(A\) \(25\frac{2}{3}\)
- \(B\) \(26\frac{5}{6}\)
- \(C\) \(33\frac{11}{12}\)
- \(D\) \(36\frac{1}{6}\)

18 What is the name of a nine-sided polygon?
- \(F\) hexagon
- \(G\) nonagon
- \(H\) heptagon
- \(J\) octagon

Use the following information to answer Questions 19 and 20.

The University of Richmond’s Women’s Basketball team scored 80, 98, 59, 67, 26, 82, 76, 76, 80, and 87 points in 10 games of the 2003–2004 season. The mean for this data is 73.1, the median is 78, the modes are 76 and 80, and the range is 72.

19 Which statement best describes what the values would be if the team played 20 games?
- \(A\) The values would all double because the number of games doubled.
- \(B\) There is no way to predict the values because the number of points scored is not a predictable value.
- \(C\) The values will stay about the same because the team will play consistently.
- \(D\) The values will increase. The more games played, the more likely it is for the team’s skills to improve.

20 What statement best justifies which measure most accurately describes the data?
- \(F\) The mean best describes the data because it is an average of all of the points scored.
- \(G\) The modes best describe the data because they are in the most occurring scores.
- \(H\) The range best describes the data because it is not a score that the team recorded.
- \(J\) The median best describes the data because it is the middle of the data set.
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

21 Ricky has $250 that he wants to put in the bank. If he keeps the money in the account for 4 years at $3\frac{1}{2}\%$ annual simple interest, how much money will he have in 4 years?  

A $600  
B $350  
C $285  
D $35

22 The sum of 5 and the quotient of 12 and a number $n$ describes which expression?  

F $\frac{12}{5} + n$  
G $5 + 12n$  
H $5 + \frac{12}{n}$  
J $\frac{12}{n} - 5$

23 Stacey and Shea were playing a board game. They drew cards to determine how their pieces moved. Shea drew $+10, -3, +8, -11, +2, -1,$ and $-6$ on his last 7 turns. How far had he progressed after his 7th turn?  

A $+4$  
B $+1$  
C $-1$  
D $-4$

24 What is the solution to $\frac{5}{3}x = 15$?  

F $9$  
G $13\frac{1}{3}$  
H $16\frac{2}{3}$  
J $25$

25 What are the coordinates of point $K$?  

A $(2, 1)$  
B $(-2, 1)$  
C $(1, 2)$  
D $(-1, 2)$

26 What point is at $(-2, -1)$?  

F $F$  
G $G$  
H $H$  
J $J$
A class experiment was conducted in which students were timed to see how long it would take to pass a stack of 3 large dictionaries around a group. The data they collected were 5 students: 6.29 seconds, 10 students: 12.15 seconds, 15 students: 19.51 seconds, 20 students: 25.05 seconds, and 25 students: 32.59 seconds. If you are making a scatter plot of this data, which statement describes the best way of labeling the axes to display the data? _7.17f_

A. x-axis for people labeled by 5’s, the y-axis for time labeled in 5 second intervals
B. x-axis for time labeled in 5 second intervals, the y-axis for people labeled by 5’s
C. x-axis for people labeled by 10’s, the y-axis for time labeled in 1 second intervals
D. x-axis for people labeled by 5’s, the y-axis for time labeled in 1 second intervals

**28.** What property is illustrated by $-7 + 2 = 2 + (-7)$? _7.3a_

- F. associative property of addition
- G. commutative property of addition
- H. associative property of multiplication
- J. commutative property of multiplication

**29.** Estimate the area of a rectangle whose length is between $8\frac{1}{2}$ and $9\frac{3}{4}$ centimeters and whose width is $5\frac{1}{4}$ centimeters. _7.7a_

- A. 40 cm²
- B. 47 cm²
- C. 52 cm²
- D. 55 cm²

**30.** Which symbol shows how $1.8 \times 10^4$ compares to 1,843.78? _7.1_

- F. <
- G. =
- H. >
- J. ≤

**31.** What type of quadrilateral is a parallelogram with 4 right angles and opposite sides congruent but not all 4 sides congruent? _7.9_

- A. square
- B. parallelogram
- C. rhombus
- D. rectangle

**32.** What function rule matches $(0, -3), (1, -1), (2, 1), (3, 3), \ldots$? _7.19_

- F. $y = x + 2$
- G. $y = 2x - 3$
- H. $y = x - 3$
- J. $y = 2x - 5$
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

33 During an experiment, Ariel tossed a fair coin 10 times and got 4 heads. What is the probability Ariel will get a head on her next toss? 7.14

A \( \frac{1}{4} \)  
B \( \frac{2}{5} \)  
C \( \frac{1}{2} \)  
D \( \frac{3}{5} \)

34 Which equation shows the multiplicative property of zero? 7.3e

F \( \frac{2}{3} + 0 = \frac{2}{3} \)  
G \( 0 \left( \frac{2}{3} \right) = 0 \)  
H \( \frac{2}{3} \left( \frac{3}{2} \right) = 1 \)  
J \( \frac{2}{3} \left( \frac{-2}{3} \right) = 0 \)

35 What is the value of the expression \( \left( \frac{3}{5} \right)^2 + 2 \left( 4 - \frac{2}{5} \right) \)? 7.2

A \( \frac{14}{25} \)  
B \( \frac{8}{5} \)  
C 9  
D \( 10 \frac{3}{5} \)

36 The frequency distribution shows how much time students spend traveling to and from school. Which graph correctly displays the data? 7.17a, c

<table>
<thead>
<tr>
<th>Interval</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–9 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10–14 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15–19 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 or more min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F  
G  
H  
J
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

37 Caitlyn volunteers 3 hours a week after school at an animal shelter. Which equation shows how many weeks it will take her to accumulate 50 hours of service? 7.20
   \[ A \quad 3 + w = 50 \]
   \[ B \quad 50 - 3 = w \]
   \[ C \quad \frac{w}{50} = 3 \]
   \[ D \quad 3w = 50 \]

38 Malcolm’s English class had the following grades on the last book report: 10, 9, 10, 8, 7, 4, 1, 0, 10, 8, 10, 9, 7, and 5. What was the median class score on the book report? 7.16
   \[ F \quad 10 \]
   \[ G \quad 8.5 \]
   \[ H \quad 8 \]
   \[ J \quad 7 \]

39 Which figure is an octagon? 7.10
   \[ A \]
   \[ B \]
   \[ C \]
   \[ D \]

40 What value is the additive inverse of 37? 7.3d
   \[ F \quad 37 \]
   \[ G \quad \frac{1}{37} \]
   \[ H \quad 0 \]
   \[ J \quad -37 \]

41 \[ \frac{1}{3}x - 4\left(\frac{2}{3}x + 8\right)^2 \] is an example of which mathematical term? 7.21
   \[ A \quad \text{expression} \]
   \[ B \quad \text{equation} \]
   \[ C \quad \text{equality} \]
   \[ D \quad \text{inequality} \]

42 Al wants to know how many ways there are to make a pizza if you have 2 types of crust—thin and thick—and you must pick 1 topping from sausage, mushroom, and onion. Which tree diagram illustrates the possible number of pizzas? 7.15
   \[ F \]
   \[ G \]
   \[ H \]
   \[ J \]
Diagnosic Test (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the box at the right of each question.

43 Which equation shows the multiplicative identity property? 7.3c

A 10 \times 1 = 10
B 10 \times 0 = 0
C 10 + 0 = 10
D 10 + (-10) = 0

44 If \(ABCD \sim FGHI\), what ratio relates the corresponding sides? 7.11

\[
\begin{align*}
F & \quad \frac{1}{4} \\
G & \quad \frac{1}{3} \\
H & \quad \frac{3}{5} \\
J & \quad \frac{5}{8}
\end{align*}
\]

45 Carla is making brownies to sell at the school bake sale. One batch makes 36 brownies. What proportion will Carla use to determine how many batches she needs to make in order to have 300 brownies to sell? 7.6

A \(\frac{36}{1} = \frac{x}{300 - 36}\)
B \(\frac{1}{36} = \frac{x}{300}\)
C \(\frac{1}{36} = \frac{300}{x}\)
D \(\frac{36}{1} = \frac{x}{300}\)

46 If \(\triangle DEF\) is rotated clockwise 90° about the origin, what are the coordinates of the image? 7.13

F \(D'(-3, 1), E'(2, -2), F'(2, 1)\)
G \(D'(-1, 3), E'(2, -2), F'(-2, 1)\)
H \(D'(-1, -3), E'(-2, 2), F'(1, 2)\)
J \(D'(3, -1), E'(2, 2), F'(-2, -1)\)

47 Don is going to make a stem-and-leaf plot of these scores. Which stem will have no leaves? 7.17d

55, 98, 51, 62, 94, 60, 75, 78, 90

A 6 \hspace{1cm} B 7
C 8 \hspace{1cm} D 9
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

48 Miguel sent a package to his grandmother. If he spent $10.75 on the postage and the total for the gift and the postage was $32.50, how much did he spend on the gift? 7.22a

F $21.75  
G $22.25  
H $38.50  
J $43.25

49 Blaire is making her mom a jewelry box. She wants to cover the box shown with handmade paper. Which expression shows how she will determine how much surface area she needs to cover? 7.8

A \(4(8 \times 10) + 2(4 \times 8)\)  
B \(10 \times 8 \times 4\)  
C \(4(10 \times 4) + 2(4 \times 8)\)  
D \(2(8 \times 10) + 2(4 \times 8) + 2(10 \times 4)\)

50 Jason surveyed people along the boardwalk in Virginia Beach to see how many times a week they exercise. Which data set fits the line plot? 7.17b

F 1 day: 3 people  
2 days: 3 people  
3 days: 3 people  
4 days: 5 people  
5 days: 1 person  
6 days: 1 person  
7 days: 3 people  
G 1 day: 2 people  
2 days: 3 people  
3 days: 3 people  
4 days: 6 people  
5 days: 1 person  
6 days: 0 person  
7 days: 3 people  
H 1 day: 2 people  
2 days: 3 people  
3 days: 4 people  
4 days: 7 people  
5 days: 0 person  
6 days: 1 person  
7 days: 3 people  
J 1 day: 3 people  
2 days: 3 people  
3 days: 4 people  
4 days: 6 people  
5 days: 0 person  
6 days: 0 person  
7 days: 2 people
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.1** The student will compare, order, and determine equivalent relationships between fractions, decimals, and percents, including use of scientific notation for numbers greater than 10.

1 Which list arranges the numbers from least to greatest?
   
   A $27\frac{4}{7}$, 27.93, 27.3%, $2.78 \times 10^2$
   
   B $2.78 \times 10^2$, 27.3%, $27\frac{4}{7}$, 27.93
   
   C 27.3%, $27\frac{4}{7}$, 27.93, $2.78 \times 10^2$
   
   D 27.93, $2.78 \times 10^2$, $27\frac{4}{7}$, 27.3%

2 Which fraction is equivalent to 5.72?

   F $\frac{572}{12}$
   
   G $\frac{143}{20}$
   
   H $\frac{143}{25}$
   
   J $\frac{108}{18}$

3 Which is the greatest value?

   A 357%
   
   B $35\frac{7}{12}$
   
   C 357.28
   
   D $3.5 \times 10^3$

4 The distance from Chicago to Roanoke is 1,161 kilometers. The distance from Chicago to Manassas is 1,135 kilometers. Which symbol shows how the distance from Chicago to Roanoke is compared to the distance from Chicago to Manassas?

   F $<$
   
   G $>$
   
   H $\leq$
   
   J $=$

5 The table shows the sizes of various items found in your house. Which list arranges the items from greatest to least?

<table>
<thead>
<tr>
<th>Item</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of a pencil</td>
<td>19 cm</td>
</tr>
<tr>
<td>Length of a safety pin</td>
<td>3.7 cm</td>
</tr>
<tr>
<td>Diameter of a toothpick</td>
<td>0.003 cm</td>
</tr>
<tr>
<td>Diameter of CD</td>
<td>12 cm</td>
</tr>
</tbody>
</table>

   A pencil, CD, safety pin, toothpick
   
   B pencil, toothpick, safety pin, CD
   
   C safety pin, toothpick, CD, pencil
   
   D pencil, safety pin, toothpick, CD
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.1** (continued)

6. Which value is equivalent to $147\%$?
   - F $1.47 \times 10^2$
   - G $\frac{147}{10}$
   - H $14.7$
   - J $1.47$
   6 ________

7. Which value is equivalent to $3.7891 \times 10^6$?
   - A $37,891,000,000$
   - B $3,789,100$
   - C $378,910$
   - D $3.7891000000$
   7 ________

8. Which fraction is equivalent to $17.82$?
   - F $\frac{891}{50}$
   - G $\frac{357}{20}$
   - H $\frac{82}{17}$
   - J $\frac{17}{82}$
   8 ________

9. Which is the least value?
   - A $1.824 \times 10^2$
   - B $18 \frac{6}{25}$
   - C $18.123$
   - D $1.824\%$
   9 ________

**OBJECTIVE 7.2** The student will simplify expressions that contain rational numbers (whole numbers, fractions, and decimals) and positive exponents, using order of operations, mental mathematics, and appropriate tools.

1. Simplify the expression $\frac{5}{3} + 7\left(\frac{4}{3} + 2\right) - \left(\frac{2}{3}\right)^2$.
   - A $12\frac{5}{9}$
   - B $23\frac{2}{3}$
   - C $24\frac{5}{9}$
   - D $25\frac{4}{9}$
   1 ________

2. Simplify the expression $2.3 + 3.7 + 18.8 + 3(4.9) + (1.3)^2$.
   - F $38.76$
   - G $41.19$
   - H $41.4$
   - J $42.1$
   2 ________
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.2 (continued)

3 You and your friends order pizza, soda, and cheese sticks at the pizza parlor. Simplify the expression $2(15.95) + 5(3.25) + 2(4.95)$ to determine what your bill should be.

A $48.30  
B $58.05  
C $63.15  
D $66.55

4 Simplify the expression $\frac{5}{4} + \frac{2}{3} + 3(\frac{1}{3} - \frac{3}{4}) \times (\frac{1}{3})^2$.

F $\frac{2}{108}$  
G $\frac{102}{108}$  
H $\frac{8}{6}$  
J $\frac{16}{9}$

5 Simplify $\frac{3}{8} + 4\left(\frac{1}{8}\right) + \left(\frac{7}{8}\right)^2 + 2\left(\frac{5}{8}\right)$.

A $4\frac{1}{8}$  
B $4\frac{3}{8}$  
C $4\frac{57}{64}$  
D $5$

6 Simplify the expression $\frac{5}{3} + 7\left(\frac{4}{3} + 2\right)$.

F $11 + 14$  
G $\frac{28}{3} + 14$  
H $11 + 2$  
J $\frac{11}{2} + 9$

7 Simplify the expression $16 + 4(3 + 8)^2 - 12 \div 3$.

A 1,948  
B 496  
C 188  
D $162\frac{2}{3}$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.3a** The student will identify and apply with real numbers the commutative and associative properties for addition and multiplication.

1. Which property is used to describe the equation $-13 + 6 = 6 + (-13)$?  
   A. associative property of multiplication  
   B. commutative property of multiplication  
   C. associative property of addition  
   D. commutative property of addition

2. Which equation shows the associative property of multiplication?  
   F. $(5)(-3)(6) = (6)(5)(-3)$  
   G. $5 + (-3 + 6) = (-3 + 6) + 5$  
   H. $5(-3 \times 6) = -15(6)$  
   J. $5(-3 \times 6) = (5 \times -3) \times 6$

3. Which equation shows the commutative property of multiplication?  
   A. $8 + 7 = 7 + 8$  
   B. $7 \times 8 = 8 \times 7$  
   C. $(7 \times 8) \times 2 = 7 \times (8 \times 2)$  
   D. $(7 + 8) + 2 = 7 + (8 + 2)$

4. Which property is shown by the equation $(-2 + 3) + 4 = -2 + (3 + 4)$?  
   F. associative property of multiplication  
   G. associative property of addition  
   H. commutative property of multiplication  
   J. commutative property of addition

5. Which property is shown by the equation $2 + (3 \times 11) = 2 + (11 \times 3)$?  
   A. commutative property of addition  
   B. commutative property of multiplication  
   C. associative property of addition  
   D. associative property of multiplication
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.3b The student will identify and apply with real numbers the distributive property.

1 Which equation uses the distributive property?
   - A $-3(4 + 7) = -3(4) + -3(7)$
   - B $-3(4 + 7) = -3(11)$
   - C $-3(4 + 7) = -3(4) + 7$
   - D $-3(4 + 7) = 4(-3) + 4(7)$

2 Which equation uses the distributive property?
   - F $9(8 + 2) = 9(8) + 2$
   - G $9(8 + 2) = 9(8) + 9(2)$
   - H $9(8 + 2) = 9(8)(2)$
   - J $9(8 + 2) = 9(8)(9)(2)$

3 If the distributive property is applied to $6(4) + 6(5)$, which is the result?
   - A $6(4 + 5)$
   - B $6(4)(5)$
   - C $(6 + 6)(4 + 5)$
   - D $36(4 + 5)$

4 If the distributive property is applied to $5(7 + 3)$, which is the result?
   - F $5(7)(3)$
   - G $5 + 7 + 3$
   - H $5(7) + 3$
   - J $5(7) + 5(3)$

5 Which equation uses the distributive property?
   - A $11(3 + -8) = 11(3)(-8)$
   - B $11(3 + -8) = 11 + 3 + -8$
   - C $11(3 + -8) = 11(3) + -8$
   - D $11(3 + -8) = 11(3) + 11(-8)$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.3c The student will identify and apply with real numbers the additive and multiplicative identity properties.

1 Which property is shown in the equation $17.35 \times 1 = 17.35$?
   A identity property of multiplication
   B inverse property of multiplication
   C identity property of addition
   D inverse property of addition

2 What is the identity for addition?
   F $\frac{1}{0}$
   G $-1$
   H 0
   J 1

3 What is the identity for multiplication?
   A $\frac{1}{0}$
   B $-1$
   C 0
   D 1

4 Which equation shows the additive identity property?
   F $6 \times 1 = 6$
   G $6 \times 0 = 0$
   H $6 + 0 = 6$
   J $6 + (-6) = 0$

5 Which equation shows the multiplicative identity property?
   A $6 \times 1 = 6$
   B $6 \times 0 = 0$
   C $6 + 0 = 6$
   D $6 + (-6) = 0$

6 Which property is shown in the equation $26 + 0 = 26$?
   F identity property of multiplication
   G identity property of addition
   H inverse property of multiplication
   J inverse property of addition
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.3d The student will identify and apply with real numbers the additive and multiplicative inverse properties.

1 What is the multiplicative inverse of $\frac{15}{7}$?
   A $-\frac{15}{7}$  B $-\frac{7}{15}$
   C $\frac{7}{15}$  D $\frac{15}{8}$

2 What is the additive inverse of $-17.6$?
   F $17.6$  G $17.4$
   H $-17.4$  J $-17.6$

3 Which equation shows the additive inverse property?
   A $19 + 0 = 19$
   B $19 \times 1 = 19$
   C $19 \left(\frac{1}{19}\right) = 1$
   D $19 + (-19) = 0$

4 Which equation shows the multiplicative inverse property?
   F $19 + 0 = 19$
   G $19 \times 1 = 19$
   H $19 \left(\frac{1}{19}\right) = 1$
   J $19 + (-19) = 0$

5 Sigmund is serving a 60 inch submarine sandwich at a meeting. He plans to cut the sandwich into sections $2\frac{1}{2}$ inches long. To find how many servings he will have he must divide 60 by $2\frac{1}{2}$. Instead, he multiplies 60 by the multiplicative inverse of $2\frac{1}{2}$. What number does he multiply 60 by?
   A $\frac{5}{2}$  B $\frac{2}{5}$
   C $-\frac{2}{5}$  D $-\frac{5}{2}$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.3e** The student will identify and apply with real numbers the multiplicative property of zero.

1. Which equation shows the multiplicative property of zero?  
   A. \(-47.9(1) = -47.9\)  
   B. \(-47.9(0) = 0\)  
   C. \(-47.9\left(\frac{479}{10}\right) = 1\)  
   D. \(-47.9(47.9) = 1\)

2. Which property is shown in the equation \(7 \times 0 = 0\)?  
   F. additive identity property  
   G. multiplicative identity property  
   H. multiplicative inverse property  
   J. multiplicative property of zero

3. Which equation shows the multiplicative property of zero?  
   A. \(0(8.3) = 0\)  
   B. \(8.3 + 0 = 8.3\)  
   C. \(8.3 + (-8.3) = 0\)  
   D. \(8.3\left(\frac{1}{8.3}\right) = 1\)

**OBJECTIVE 7.4a** The student will solve practical problems using rational numbers (whole numbers, fractions, decimals) and percents.

1. A pet store has 32 turtles for sale. If \(\frac{5}{8}\) of these turtles are males, how many male turtles does the store have?  
   A. 24  
   B. 20  
   C. 12  
   D. 4

2. The largest bell contained in the Luray Singing Tower weighs 4,640 pounds. The smallest bell weighs 12.5 pounds. The weight of the smallest bell is what percent of the weight of the largest bell? Round your answer to 1 decimal place.  
   F. 0.3%  
   G. 2.7%  
   H. 3.7%  
   J. 12.5%

3. Sam bought 6 bagels that cost $1.29 each and cream cheese that cost $2.65. What was the total bill before tax?  
   A. $3.94  
   B. $7.74  
   C. $10.39  
   D. $23.64
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.4a (continued)

4 Margery bought 24 plants. If \( \frac{2}{3} \) of them were petunias and \( \frac{1}{6} \) were marigolds, how many plants were neither petunias nor marigolds?

F 4  G 6  
H 8  J 12

5 There are about 125 boats on exhibit in the Small Craft Collection of the Mariners’ Museum in Newport News. Of these, about 40 are work boats. What percent of the boats are work boats?

A 31.25%  B 32%  
C 40%  D 50%

OBJECTIVE 7.4b The student will solve consumer-application problems involving tips, discounts, sales tax, and simple interest.

1 Joshua’s family went out for dinner. The meals with tax cost $78.43. If they leave a 15% tip, how much money did they spend on dinner?

A $11.76  B $66.67  
C $90.19  D $117.65

2 Kayla was visiting the University of Virginia and wanted to buy a souvenir sweatshirt. She found one for $49.95 and it was on sale for 40% off. How much did the sweatshirt cost Kayla?

F $199.80  G $69.93  
H $29.97  J $19.98

3 Jackson bought new basketball shoes. If the shoes cost $69.50 and sales tax is \( 4\frac{1}{2}\% \), how much did Jackson spend for his new shoes?

A $3.13  B $31.28  
C $66.37  D $72.63

4 Michaela has saved $750 and wants to put it into a savings account that earns 3.7% simple interest annually. If Michaela keeps her money in the account for 4 years, how much simple interest does she earn?

F $111.00  G $777.75  
H $861.00  J $1,110.00
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.4b** (continued)

5 The table shows part of the menu for a local deli. If your family’s order consists of 2 bagel dogs, a roast beef sandwich, a chicken Caesar salad, 3 bags of deli chips, and 4 cookies, what is the total bill if there is a 4% sales tax?

<table>
<thead>
<tr>
<th>Food</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roast Beef Sandwich</td>
<td>$3.95</td>
</tr>
<tr>
<td>Chicken Caesar Salad</td>
<td>$4.50</td>
</tr>
<tr>
<td>Bagel Dog</td>
<td>$2.75</td>
</tr>
<tr>
<td>Deli Chips</td>
<td>$0.75</td>
</tr>
<tr>
<td>Cookies</td>
<td>2 for $1.50</td>
</tr>
</tbody>
</table>

A $0.77  B $18.43  C $19.20  D $19.97

6 The decorating committee wants to order glow necklaces for the fall dance. The cost is $49.95 for 50 necklaces. If the committee orders 200 or more necklaces, they receive a 15% discount. The committee decides to order 350 necklaces. How much does their order cost after the discount?

F $52.45  G $297.20  H $349.65  J $402.10

7 Hakeem inherited $1,500 and wants to put it in an account that earns $4\frac{1}{4}$% simple interest annually. How much money is in the account after 3 years?

A $3,412.50  B $1,691.25  C $1,308.75  D $191.25

8 While visiting Luray Caverns, Jordan’s family decided to have lunch at a local restaurant. The bill for lunch was $47.83. If Jordan’s mom decided to leave the waitress an 18% tip, how much money did the waitress earn from the lunch?

F $86.09  G $56.44  H $39.22  J $8.61

**OBJECTIVE 7.5** The student will formulate rules for and solve practical problems involving basic operations (addition, subtraction, multiplication, and division) with integers.

1 The lowest temperature one day in Chincoteague was 28°F. The highest temperature that day was 45°F. How much change was there between the low and high temperatures?

A 15°  B 17°  C 50°  D 73°

2 Mona and Sean are playing a board game in which their moves are decided by spinning a spinner. Sean spun +5, −7, +1, −2, −3, and +4 on his last 6 turns. How far has he moved for his 6 turns?

F 10  G 2  H −2  J −12
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.5 (continued)

Use the following information to answer Questions 3 and 4.
Carla and Steve are playing miniature golf at an adventure park in Wintergreen. The scorecard shows how each of them did compared to the number of swings the designer thinks it should take to complete the hole.

<table>
<thead>
<tr>
<th>Hole</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carla</td>
<td>0</td>
<td>+1</td>
<td>-2</td>
<td>+3</td>
<td>0</td>
<td>+1</td>
<td>-1</td>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>Steve</td>
<td>+1</td>
<td>+1</td>
<td>+2</td>
<td>-1</td>
<td>-2</td>
<td>0</td>
<td>+1</td>
<td>+1</td>
<td>0</td>
</tr>
</tbody>
</table>

3 What was Steve’s score at the end of the game compared to the number of swings the holes should take?
   A  -3
   B  0
   C  +3
   D  +6

4 How did Carla’s final score compare to Steve’s score?
   F  +2
   G  +1
   H  -1
   J  -3

5 Bryan wants to buy 15 postcards and 28 postage stamps. If postcards cost 23 cents and postage stamps cost 37 cents, how much will Bryan spend?
   A  $13.81
   B  $12.71
   C  $11.99
   D  $1.03

6 Keshau’s family is going to place an online order for tickets to an amusement park in Doswell. His family consists of 4 adults and 2 children. How much money will they spend on tickets?

<table>
<thead>
<tr>
<th>Ticket Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
</tr>
<tr>
<td>Children</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>H</td>
</tr>
</tbody>
</table>

7 The perimeter of a square is 32 centimeters. If you increase each side by 3 centimeters, what is the measure of each new side?
   A  19 cm
   B  11 cm
   C  8 cm
   D  5 cm
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.6** The student will use proportions to solve practical problems, which may include scale drawings, that contain rational numbers (whole numbers, fractions, and decimals) and percents.

1 One gallon of paint covers approximately 400 square feet. If Julia needs to paint 738 square feet, which proportion will she use to determine how many gallons of paint she needs to buy?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( \frac{400}{x} = \frac{738}{1} )</td>
</tr>
<tr>
<td>B</td>
<td>( \frac{1}{x} = \frac{738}{400} )</td>
</tr>
<tr>
<td>C</td>
<td>( \frac{400}{1} = \frac{x}{738} )</td>
</tr>
<tr>
<td>D</td>
<td>( \frac{1}{400} = \frac{x}{738} )</td>
</tr>
</tbody>
</table>

2 A 6-ounce container of yogurt contains 5 grams of protein. Use a proportion to determine about how much protein would be in a 2.5-ounce container.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>2.1 g</td>
</tr>
<tr>
<td>G</td>
<td>3 g</td>
</tr>
<tr>
<td>H</td>
<td>10 g</td>
</tr>
<tr>
<td>J</td>
<td>12 g</td>
</tr>
</tbody>
</table>

3 Brenda is making bread for dinner. The recipe she has uses 10 pounds of flour and makes 12 loaves of bread. Which proportion should Brenda use to determine the amount of flour she needs to make 2 loaves of bread?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( \frac{10}{12} = \frac{c}{2} )</td>
</tr>
<tr>
<td>B</td>
<td>( \frac{10}{2} = \frac{c}{12} )</td>
</tr>
<tr>
<td>C</td>
<td>( \frac{10}{c} = \frac{2}{12} )</td>
</tr>
<tr>
<td>D</td>
<td>( \frac{c}{10} = \frac{12}{2} )</td>
</tr>
</tbody>
</table>

**Use the scale drawing to answer Questions 4 and 5.**

4 What is the actual length of the living room if the length of the living room shown in the scale drawing is 2.4 centimeters?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>1.25 m</td>
</tr>
<tr>
<td>G</td>
<td>3.6 m</td>
</tr>
<tr>
<td>H</td>
<td>6 m</td>
</tr>
<tr>
<td>J</td>
<td>7.2 m</td>
</tr>
</tbody>
</table>

5 If the kitchen is 6 meters long, what proportion would you use to determine the length of the kitchen in the scale drawing?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( \frac{1}{3} = \frac{d}{6} )</td>
</tr>
<tr>
<td>B</td>
<td>( \frac{3}{1} = \frac{d}{6} )</td>
</tr>
<tr>
<td>C</td>
<td>( \frac{1}{6} = \frac{d}{3} )</td>
</tr>
<tr>
<td>D</td>
<td>( \frac{1}{d} = \frac{6}{3} )</td>
</tr>
</tbody>
</table>
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.6 (continued)

6 The tallest building in Virginia is the James Monroe Building in Richmond. If a scale model is built that measures $17\frac{1}{8}$ centimeters tall and was built using a scale of 1 centimeter : 8 meters, use a proportion to determine the height of the actual building.

- F $2\frac{9}{64}$ m
- G $25\frac{1}{8}$ m
- H $89\frac{3}{8}$ m
- J 137 m

7 For your math homework, your teacher wants you to create a scale drawing of your class picture. Your class picture measures 40 centimeters by 60 centimeters by 60 centimeters and your teacher wants you to use a scale of $\frac{1}{2}$ centimeter = 10 centimeters. Use proportions to determine the dimensions of your completed scale drawing.

- A 2 cm $\times$ 3 cm
- B 20 cm $\times$ 30 cm
- C 10 cm $\times$ 15 cm
- D 0.1 cm $\times$ 0.15 cm

8 An O-scale model train is built using the scale 1:48. If an O-model train engine is 4 inches long, use a proportion to determine the length of the actual engine.

- F 192 in.
- G 125 in.
- H 52 in.
- J 12 in.

OBJECTIVE 7.7a The student, given appropriate dimensions, will estimate and find the area of polygons by subdividing them into rectangles and right triangles.

1 What is the area of the pentagon?

- A 48 cm$^2$
- B 64 cm$^2$
- C 88 cm$^2$
- D 106 cm$^2$

2 Estimate the area of a rectangle whose length is $16\frac{1}{2}$ inches and whose width is between $7\frac{1}{4}$ inches and $8\frac{1}{2}$ inches.

- F 64 in$^2$
- G 115 in$^2$
- H 130 in$^2$
- J 145 in$^2$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.7a (continued)

3 What is the area of the hexagon?
   A 216 mm²
   B 168 mm²
   C 120 mm²
   D 72.8 mm²

4 George wants to put new carpet in this family room. What area will the new carpet cover?
   F 384 ft²
   G 328 ft²
   H 288 ft²
   J 124 ft²

5 Which is a reasonable estimate for the area of a right triangle with a base of 20.2 centimeters and height between 8.6 and 9.3 centimeters?
   A 120 cm²
   B 110 cm²
   C 100 cm²
   D 90 cm²

OBJECTIVE 7.7b The student, given appropriate dimensions, will apply perimeter and area formulas in practical situations.

Use the figure to answer Questions 1 and 2.

1 What is the area of the parallelogram?
   A 35 cm²
   B 80 cm²
   C 136 cm²
   D 170 cm²

2 What is the perimeter of the parallelogram?
   F 27 cm
   G 35 cm
   H 54 cm
   J 70 cm

3 George needs to put wood trim along the perimeter of the room. How much trim does George need to buy?
   A 86 ft
   B 80 ft
   C 76 ft
   D 62 ft
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.7b (continued)

For Questions 4 and 5, use this figure of Samantha’s backyard.

4 Samantha is buying fertilizer for the grass in her backyard. How many square feet does she have to fertilize?
   F 4,200 ft²
   G 3,400 ft²
   H 3,000 ft²
   J 2,860 ft²

5 If Samantha puts a fence around the perimeter of her yard, how many feet of fencing does she need?
   A 4,200 ft
   B 3,400 ft
   C 300 ft
   D 260 ft

OBJECTIVE 7.8 The student will investigate and solve problems involving the volume and surface area of rectangular prisms and cylinders, using concrete materials and practical situations to develop formulas.

1 Which expression shows how to find the surface area of the rectangular prism?
   A $2(12 \cdot 5) + 2(10 \cdot 5) + 2(12 \cdot 10)$
   B $12(10)(5)$
   C $4(12)+4(10)+4(5)$
   D $6(12 + 10 + 5)$

2 What is the volume of the cylinder?
   F 289.03 cm³
   G 578.05 cm³
   H 1,156.11 cm³
   J 4,624.42 cm³
3 Jeff buys a container of popcorn at an amusement park in Wytheville. The container is a rectangular prism that is 4 inches long, 4 inches wide, and 6 inches tall. What is the volume of the container?
A 14 in³  B 22 in³  C 96 in³  D 128 in³

4 Which figure shows how to break down a cylinder to compute its surface area?
F

G

H

J

5 Christina is creating a decorative pencil holder from recycled materials. She is taking an empty paint can and decorating the outside with old comic strips. Christina needs to determine how much surface area she needs to cover with comic strips, if she leaves the top open for pencils. If the paint can is 12 centimeters tall and has a diameter of 10\(\frac{1}{2}\) centimeters, what is the area to be covered?
A 1,484.40 cm²  B 1,138.04 cm²  C 569.02 cm²  D 482.43 cm²

6 Which expression can be used to find the volume of the cylinder?
F  \(\pi \cdot 4^2 \cdot 25\)  G  \(\pi \cdot 8^2 \cdot 25\)
H  \(\pi \cdot 25^2 \cdot 8\)  J  \(\pi \cdot 12.5^2 \cdot 8\)

7 Which expression can be used to find the volume of the cereal box?
A  \(2\left(\frac{8}{4} \cdot \frac{2}{4}\right) + 2\left(\frac{3}{4} \cdot 12\right) + 2\left(\frac{8}{4} \cdot 12\right)\)  B  \(4\left(\frac{8}{4} \cdot \frac{2}{4}\right) + 2\left(\frac{3}{4} \cdot 12\right)\)
C  \(2\left(\frac{8}{4}\right) + \left(\frac{2}{4}\right) + (12)\)  D  \(\frac{8}{4} \cdot \frac{2}{4} \cdot 12\)
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.9 The student will compare and contrast the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. Deductive reasoning and inference will be used to classify quadrilaterals.

1 Which property distinguishes a rectangle from a rhombus?
   A 4 sides
   B 4 congruent sides
   C opposite sides congruent and parallel
   D 4 right angles

2 What type of quadrilateral has only one set of parallel sides?
   F rhombus
   G trapezoid
   H square
   J rectangle

3 How would you classify the figure?
   A rhombus
   B square
   C rectangle
   D trapezoid

4 Which figure is a square?
   F
   G
   H
   J

5 Which property distinguishes a trapezoid from a parallelogram?
   A 4 right angles
   B exactly one pair of parallel sides
   C 2 pairs of parallel sides
   D 4 congruent sides
Standards Practice

**OBJECTIVE 7.9** (continued)

6 How would you classify the polygon?

- **F** parallelogram
- **G** rhombus
- **H** trapezoid
- **J** rectangle

7 The base of the Washington Monument is shown in the figure. How would you classify this polygon?

- **A** rectangle
- **B** rhombus
- **C** trapezoid
- **D** square

**OBJECTIVE 7.10** The student will identify and draw the following polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon.

1 How many sides does a heptagon have?

- **A** 6
- **B** 7
- **C** 8
- **D** 9

2 What type of polygon is the stop sign?

- **F** octagon
- **G** hexagon
- **H** nonagon
- **J** decagon

3 How many sides does a nonagon have?

- **A** 7
- **B** 8
- **C** 9
- **D** 10
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.10

4 What type of polygon is shown?
   F heptagon
   G nonagon
   H decagon
   J pentagon

5 Which figure is a hexagon?
   A
   B
   C
   D

6 How many exterior sides does The Pentagon in Arlington have?
   F 5
   G 6
   H 7
   J 8

7 How many sides does a decagon have?
   A 10
   B 9
   C 7
   D 5

8 A school crossing sign is what type of polygon?
   F decagon
   G heptagon
   H hexagon
   J pentagon
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.11** The student will determine if geometric figures—quadrilaterals and triangles—are similar and write proportions to express the relationships between corresponding parts of similar figures.

1. If $\triangle ABC \sim \triangle DEF$, what ratio relates the corresponding sides of $\triangle ABC$ to $\triangle DEF$?

   1. _________

   ![Diagram of $\triangle ABC$ and $\triangle DEF$]

   A. 2 to 1  
   C. 1 to 2  
   B. 1 to 1  
   D. 1 to 4

2. Which two figures are similar?

   2. _________

   ![Images of Figure 1 to Figure 4]

   F. 1 and 2  
   H. 2 and 3  
   G. 2 and 4  
   J. 1 and 3

3. Nora has a $2\frac{1}{2}$ inch by 3 inch sticker of Berkeley Plantation. While she was visiting Berkeley, she bought a postcard of the plantation that measures 5 inches by 6 inches. What is the ratio of the sticker size to the postcard size?

   3. _________

   A. 1 to 3  
   C. 2 to 5  
   B. 2 to 3  
   D. 1 to 2

4. If $\triangle JKL \sim \triangle RST$, which of these statements is true?

   4. _________

   F. $\angle K \sim \angle T$  
   H. $\angle L \equiv \angle S$  
   G. $\angle J \equiv \angle R$  
   J. $\angle K \equiv \angle R$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.11 (continued)

5 The figure shows a section of a stained glass lamp on display at an art museum in Norfolk. What is the minimum amount of information that you would need to determine if piece A is similar to piece B?
   A. An angle measure and 2 side measures of each piece
   B. All four angle measures and all four side lengths for each piece
   C. Two angle measures and 2 side measures for each piece are the same
   D. All four side lengths of each piece

6 The two polygons shown are similar. What is the ratio of the smaller polygon’s side lengths to the larger polygon’s side lengths?

F. 7 to 3
G. 2 to 1
H. 1 to 2
J. 3 to 7

OBJECTIVE 7.12 The student will identify and graph ordered pairs in the four quadrants of a coordinate plane.

Use the graph to answer Questions 1–3.

1 What points are in Quadrant II?
   A. K and P
   B. L and N
   C. M and Q
   D. J and R

2 What are the coordinates of point K?
   F. (4, 1)
   H. (1, 4)
   J. (−4, 1)

3 What point is at (1, 4)?
   A. L
   B. N
   C. Q
   D. R
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.12** (continued)

Use the graph to answer Questions 4–8.

4. What are the coordinates of point \( A \)?
   - F (4, 2)
   - G (2, 4)
   - H (5, 1)
   - J (3, 3)

5. Which point is at \((-3, 3)\)?
   - A F
   - B G
   - C H
   - D J

6. What are the coordinates of the point in Quadrant III?
   - F \((-2, -4)\)
   - G \((4, -2)\)
   - H \((-4, -2)\)
   - J \((2, -4)\)

7. Which point is at \((3, -2)\)?
   - A F
   - B G
   - C H
   - D J

8. Which quadrant has the most points plotted in it?
   - F I
   - G II
   - H III
   - J IV
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.13** The student, given a polygon in the coordinate plane, will represent transformations—rotations and translation—by graphing the coordinates of the vertices of the transformed polygon and sketching the resulting figure.

1. What are the coordinates of the image of $ABCD$ after you translate the polygon 3 units up and 2 units right?
   - A. $A'(-2, 1), B'(-4, 2), C'(-4, -1), D'(-2, -2)$
   - B. $A'(0, -2), B'(-2, -1), C'(-2, -4), D'(0, -5)$
   - C. $A'(1, 0), B'(-1, 1), C'(-1, -2), D'(1, -3)$
   - D. $A'(0, 1), B'(-2, 2), C'(-2, -1), D'(0, -2)$

2. What transformation of $\triangle ABC$ produces $\triangle A'B'C'$?
   - F. a $90^\circ$ counter-clockwise rotation about point $B$
   - G. a translation of 4 units left
   - H. a $90^\circ$ clockwise rotation about point $B$
   - J. a translation of 4 units left and 4 units down

3. Polygon $JKLM$ was translated to get $J'K'L'M'$. What translation was performed?
   - A. right 5 down 3
   - B. left 5 up 3
   - C. left 3 down 5
   - D. right 3 up 5
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.13** (continued)

4 If $\triangle RST$ with coordinates $R(3, -3)$, $S(4, -6)$, and $T(2, -6)$ is rotated counter-clockwise $270^\circ$ about the origin, what are the coordinates of the image?

- **F** $R'(-3, -3), S'(-6, -4), T'(-6, -2)$
- **G** $R'(-3, -3), S'(-4, -6), T'(-2, -6)$
- **H** $R'(-3, -3), S'(-6, -2), T'(-6, -4)$
- **J** $R'(3, 3), S'(4, 6), T'(2, 6)$

5 A quilt design is shown. What transformation is used to create the lighter images?

- **A** a translation 3 units right and 3 units down
- **B** a rotation of $90^\circ$ clockwise
- **C** a translation of 3 units right
- **D** a rotation of $270^\circ$ counter-clockwise

**OBJECTIVE 7.14** The student will investigate and describe the difference between the probability of an event found through simulation versus the theoretical probability of that same event.

1 Moira wrote the numbers 1 through 5 on pieces of paper and folded each piece. She placed the papers in a bucket, shook them up, picked a piece of paper, and recorded the results. Moira repeated this process 100 times. The table shows her results. For which numbers did the experimental probability equal the theoretical probability?

<table>
<thead>
<tr>
<th>Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times Occurred</td>
<td>11</td>
<td>20</td>
<td>25</td>
<td>20</td>
<td>24</td>
</tr>
</tbody>
</table>

- **A** 1, 3
- **B** 2, 4
- **C** 1, 2
- **D** 3, 5
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.14 (continued)

2. During an experiment, Tamsen rolled a six-sided number cube 30 times and rolled a one 6 times. What is the probability Tamsen will roll a one on her next roll?

F \( \frac{1}{8} \)
G \( \frac{1}{6} \)
H \( \frac{1}{5} \)
J \( \frac{1}{4} \)

3. Antwon wants to conduct an experiment to determine if the spinner he created for a game is fair. He performs 500 trials. The results of all of the spins are in the table. Which statement best describes what Antwon can conclude about his spinner?

<table>
<thead>
<tr>
<th>Color Spun</th>
<th>Number of Times Spun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>186</td>
</tr>
<tr>
<td>Yellow</td>
<td>125</td>
</tr>
<tr>
<td>Orange</td>
<td>63</td>
</tr>
<tr>
<td>Blue</td>
<td>62</td>
</tr>
<tr>
<td>Purple</td>
<td>64</td>
</tr>
</tbody>
</table>

A. The experimental and theoretical probabilities are too close, so he must have made a mistake.
B. The experimental and theoretical probabilities match extremely well so Antwon’s spinner appears to be fair.
C. None of the probabilities are close so the spinner is not fair.
D. The spinner cannot be fair because the colors do not appear equally.
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.15 The student will identify and describe the number of possible arrangements of several objects, using a tree diagram or the Fundamental (Basic) Counting Principle.

1 Which situation could be represented by this tree figure? 1 __________

A Joe has to choose wheat bread, one meat from ham or salami, and cheese or no cheese.
B Joe has to choose rye or wheat bread, one meat from ham or salami, and cheese.
C Joe has to choose one meat from ham, salami, or turkey, and cheese or no cheese.
D Joe has to choose rye or wheat bread, one meat from ham, salami, or turkey, and cheese or no cheese.

2 Ava needs to determine the total number of possible ways she can create a quilt square using triangles. She has 12 blue, 8 red, 3 white, and 9 green triangles. According to the Fundamental Counting Principle, how many possible arrangements are there if she must choose 1 triangle of each color? 2 __________

F 32
G 108
H 123
J 2,592

3 Which choice shows the number of possible 3-digit lock combinations if you can use numbers from 0 to 24 if repetition is allowed? 3 __________

A \(25 + 25 + 25\)
B \(25 \cdot 25 \cdot 25\)
C \(25 \cdot 24 \cdot 23\)
D \(25 + 24 + 23\)
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.15 (continued)

4 Izabelle had to create a situation that illustrates the use of the Fundamental Counting Principle for \(5 \times 1 \times 2\). Which situation could she use?

F How many ways are there to visit 5 different museums and write 2 sentences about each museum?

G How many sentences will you write if you visit 5 exhibits at the Smithsonian, writing 1 sentence for each exhibit covering 2 things you noticed?

H How many ways are there to arrange 5 history books, 1 art book, and 2 science books on a shelf?

J How many ways are there to arrange 5 cookies of 2 different types on 1 plate?

OBJECTIVE 7.16 The student will create and solve problems involving the measures of central tendency (mean, median, mode) and the range of a set of data.

1 Mrs. Smith’s math class received these scores on their last quiz.

10, 8, 5, 7, 9, 8, 3, 5, 9, 8, 6, 6, 9, 7, 4.

What was the mean score for the quiz?

A 6.93

B 7

C 8.5

D 104

Use the following information to answer Questions 2 and 3.

The professional football team in Washington DC scored 16, 33, 21, 20, 25, 13, 7, 14, 27, 17, 23, 20, 20, 0, 24, and 7 points in the 2003 season.

2 What is the median for this set of data?

F 17.9

G 20

H 20.5

J 26

3 What is the mode for this set of data?

A 0

B 7

C 20

D 33
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.16** (continued)

4 Which set of data has a range of 22.9?
   - F 121.7, 132.2, 109.3, 125.5, 128.1
   - G 130.3, 118.7, 108.6, 122.4, 126.1
   - H 103.9, 110.7, 122.5, 129.0, 131.4
   - J 107.5, 130.4, 123.6, 120.9, 137.1

5 The heights of 10 seventh grade students are 44 inches, 62 inches, 57 inches, 63 inches, 49 inches, 65 inches, 58 inches, 60 inches, 56 inches, and 58 inches. What is the mode of this data?
   - A 58 in.
   - B 59 in.
   - C 60 in.
   - D 62 in.

   - F 21.68
   - G 21.69
   - H 21.70
   - J 21.72

7 What is the mean for the data set 1.98, 3.21, 7.84, 1.92, 4.37, 1.98, and 6.15?
   - A 3.21
   - B 3.92
   - C 4.58
   - D 5.49

8 Craig swims the 100 meter freestyle. In his past 5 swim meets, he has recorded times of 102.30, 105.13, 100.24, 110.48, and 101.05. What is the range of his times?
   - F 1.25
   - G 2.18
   - H 5.35
   - J 10.24
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.17a  The student, given a problem situation, will collect, analyze, display, and interpret data, using frequency distributions.

1 Cheung has been observing the number of students who use the library during their study hall. From her observations, she constructed this frequency distribution. Which statement summarizes Cheung’s observations?

A The library is busiest at the end of the day.
B Not many students use the library during study hall.
C The library is not a popular place.
D The number of students using the library during study hall is steady throughout the day.

<table>
<thead>
<tr>
<th>Study Hall Period</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>JHJ</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>JHJJJ</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>JHJJJJ</td>
<td>13</td>
</tr>
</tbody>
</table>

For Questions 2 and 3, use this table which shows the number of free throws made by each player on a basketball team.

2 Which statement is true?

F More than half of the players made at least 4 free throws.
G Half of the players made fewer than 3 free throws.
H Most of the players made all 6 free throws.
J Only 4 players made more than 4 free throws.

<table>
<thead>
<tr>
<th>Number of Free Throws</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>JJJ</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 How many basketball players shot free throws?

A 6
B 12
C 18
D 24
OBJECTIVE 7.17b The student, given a problem situation, will collect, analyze, display, and interpret data, using line plots.

1 Which line plot matches this set of data?
   6, 15, 14, 8, 10, 10, 6, 13, 8, 12, 11, 10

A

B

C

D

For Questions 2–4, use this line plot which shows the mathematics quiz grades for students in a 7th grade class.

2 How many students took the quiz?
   F 10
   G 19
   H 26
   J 32

3 Which statement is true?
   A Half of the students got a grade of 8.
   B Half of the students got a grade of 8 or higher.
   C Half of the students got a grade less than 7.
   D More students got a grade of 6 than any other grade.

4 Two students were absent the day of the quiz. If they both scored 7 when they made up the quiz, which statement is now true?
   F Half of the students got a grade of 8.
   G Half of the students got a grade of 8 or higher.
   H More students got a grade of 8 than any other grade.
   J The number of students who got a grade of 7 was the same as the number of students who got a grade of 8.
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.17c The student, given a problem situation, will collect, analyze, display, and interpret data, using histograms.

1 Which is a reasonable conclusion based on this histogram showing the ages of audience members at a comedy club?

A The club can seat only 100 people.
B There were fewer teens than people aged 60 and older.
C The club attracts mainly people aged 60 and older.
D More men than women visit the club.

For Questions 2 and 3, use this histogram which shows the minutes students spent during one week practicing the piano.

2 Which is a true statement?
   F Most of the students practiced more than 40 minutes.
   G Most of the students practiced 120 minutes.
   H More students practiced between 41 and 60 minutes than students who practiced between 61 and 80 minutes.
   J Fewer students practiced less than 60 minutes than students who practiced more than 100 minutes.

3 How many students are represented on this histogram?
   A 8
   B 19
   C 28
   D 34
Standards Practice

*Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.*

**OBJECTIVE 7.17d** The student, given a problem situation, will collect, analyze, display, and interpret data, using stem-and-leaf plots.

1. Seventh grade students were asked how much time they spent each day on homework. Their answers were put into the stem and leaf plot. What is the least amount of time spent on homework?

   - A 49 min
   - B 10 min
   - C 5 min
   - D 1 min

2. The average January temperature in Richmond is 37 degrees Fahrenheit. How many of these cities have a higher average January temperature than Richmond?

   - F 6
   - G 5
   - H 4
   - J 3

3. How many of these cities have an average January temperature in the 20’s?

   - A 1
   - B 2
   - C 3
   - D 4
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.17e** The student, given a problem situation, will collect, analyze, display, and interpret data, using box-and-whisker plots.

**Use the following information to answer Questions 2 and 3.**

The ages of some of the workers at the zoo in Norfolk are 37, 28, 18, 16, 21, 32, 51, 48, 35, 27, 58, 33, and 29.

1. What value would be at the lower or first quartile?
   - A 16
   - B 24
   - C 32
   - D 58

2. Which box-and-whisker plot fits the data?
   - F
   - G
   - H
   - J

3. What is the upper quartile of this data set?
   - A 5.5 years
   - B 11 years
   - C 15 years
   - D 16.5 years

4. Which box-and-whisker plot fits the data?
   - F
   - G
   - H
   - J

---

**For Questions 3 and 4, use this table of average life spans of various animals.**

<table>
<thead>
<tr>
<th>Animal</th>
<th>Average Life Span (yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear</td>
<td>18</td>
</tr>
<tr>
<td>Chipmunk</td>
<td>6</td>
</tr>
<tr>
<td>Moose</td>
<td>12</td>
</tr>
<tr>
<td>Mouse</td>
<td>3</td>
</tr>
<tr>
<td>Lion</td>
<td>15</td>
</tr>
<tr>
<td>Kangaroo</td>
<td>5</td>
</tr>
<tr>
<td>Squirrel</td>
<td>8</td>
</tr>
<tr>
<td>Cat</td>
<td>11</td>
</tr>
<tr>
<td>Hippopotamus</td>
<td>30</td>
</tr>
</tbody>
</table>
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.17f** The student, given a problem situation, will collect, analyze, display, and interpret data, using scattergrams.

1. **For a science class Shannon planted 10 beans and recorded their growth after 4 weeks in this scatter plot. Which is a reasonable conclusion based on the graph?**
   - A Shannon planted the beans incorrectly.
   - B The beans will be more than 2 ft tall in 6 weeks.
   - C All of the beans sprouted.
   - D The beans grew poorly without sun.

2. **This scatter plot shows the Olympic winning times in the women’s 100 meter freestyle for various years. Which is a reasonable conclusion based on this graph?**
   - F The winning time has been mostly decreasing since 1912.
   - G The winning time in 1960 was half the winning time in 1912.
   - H The winning time decreased by more than 20 seconds from 1912 to 1948.
   - J In 2004 a winning time of 1.4 minutes can be expected.

For Questions 3 and 4, use this scatter plot which shows the prices of homes with various areas in one neighborhood.

3. **Which would be a reasonable estimate for the cost of a house having 2,400 square feet, based on this graph?**
   - A $750,000
   - B $450,000
   - C $230,000
   - D $100,000

4. **Which statement is true?**
   - F There appears to be no relationship between price and square feet.
   - G As the square feet increases, the price stays the same.
   - H As the square feet increases, the price decreases.
   - J As the square feet increases, the price increases.
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.18 The student will make inferences, conjectures, and predictions based on analysis of a set of data.

Use the following information to answer Questions 1 and 2.

The graph shows the monthly precipitation in Fredericksburg for 5 months.

1 Which of the 5 months had the greatest precipitation?
   A October
   B November
   C December
   D January

2 What is a reasonable amount of precipitation that Fredericksburg will have in March?
   F 5 in.
   G 3.5 in.
   H 2.5 in.
   J 1.5 in.

Use the following information to answer Questions 3–5.

Jamal runs 5 kilometer races. His times for the last 10 races he ran are shown in the stem-and-leaf plot.

3 What was Jamal’s fastest time?
   A 29 min 1 s
   B 27½ min
   C 26½ min
   D 26 min 3 s

4 What can you conclude about Jamal’s times?
   F Jamal’s times for a 5 km race have a range of 2.8 minutes.
   G Jamal runs faster early in each race.
   H Jamal runs only at the end of the month.
   J Jamal has been getting faster.

5 Jamal decided to run in the Ashland Railroad Run, a 10K race in Ashland. Based on his best performance in the 5K races, which is the best prediction of his time in the 10K race if he runs at the same rate?
   A 45 min
   B 55 min
   C 60 min
   D 70 min
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.18 (continued)

6 Johanna surveyed 15 students to see how many books they read over the summer. The responses were 25, 2, 18, 36, 12, 19, 20, 15, 1, 10, 5, 8, 0, 5, and 10. With these data, she calculated the mean to be 12.4 books, the median to be 10, the modes to be 10 and 5, and the range to be 36.
Which of these is a reasonable conclusion?

F Most students read more than 30 books.
G Half the students read exactly 10 books.
H Everybody read at least 1 book.
J Some students read twice as many books as other students.

OBJECTIVE 7.19 The student will represent, analyze, and generalize a variety of patterns, including arithmetic sequences and geometric sequences, with tables, graphs, rules, and words in order to investigate and describe functional relationships.

1 Which table matches the function \( y = 12 - 3x \)?

A

<table>
<thead>
<tr>
<th>x</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
</tr>
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<tbody>
<tr>
<td>y</td>
<td>18</td>
<td>15</td>
<td>12</td>
<td>9</td>
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B

<table>
<thead>
<tr>
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<tr>
<td>y</td>
<td>6</td>
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<td>12</td>
<td>9</td>
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</table>

C

<table>
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<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>3</td>
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</table>

D

<table>
<thead>
<tr>
<th>x</th>
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<th>4</th>
<th>6</th>
<th>8</th>
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<td>y</td>
<td>6</td>
<td>3</td>
<td>1.5</td>
<td>0.75</td>
</tr>
</tbody>
</table>

2 Which table matches the graph?

F

<table>
<thead>
<tr>
<th>x</th>
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<th>2</th>
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<td>y</td>
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<td>2</td>
<td>5</td>
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</table>

G

<table>
<thead>
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<th>2</th>
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<tbody>
<tr>
<td>y</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
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H

<table>
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<th>2</th>
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<tbody>
<tr>
<td>y</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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</table>

J

<table>
<thead>
<tr>
<th>x</th>
<th>-1</th>
<th>2</th>
<th>5</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>-1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

3 Orion needs to set a schedule to read a book for English. He was able to read 18 pages in class today. He thinks that he can read 22 pages a night. Which function rule represents this situation?

A \( y = 18x + 22 \)
B \( y = x + 22 \)
C \( y = 22x + 18 \)
D \( y = x + 18 \)
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.19 (continued)

4 What is the common ratio for the sequence 3, 6, 12, 24, …?
   F 6  G 4  H 3  J 2

5 Which of the following graphs is a linear function of \( x \)?
   A  
   B  
   C  
   D

6 Which graph contains the points (0, 4) and (2, 3)?
   F  
   G  
   H  
   J

7 Ahmad is competing in a bicycle race. The event is a 10.4 mile race consisting of 8 laps. The table shows Ahmed’s progress. How long did Ahmed take to complete 5 laps?

<table>
<thead>
<tr>
<th>Lap</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elapsed Time (min)</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
</tr>
</tbody>
</table>

   A 15 min  B 25 min  C 30 min  D 35 min
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.20 The student will write verbal expressions as algebraic expressions and sentences as equations.

1 Four less than five times a number is which expression?
A 4 - 5n  B 4n - 5  C 5n - 4  D 5 - 4n

2 Fiona is bowling for charity. Her uncle has pledged her $0.25 for each pin she knocks down. If Fiona’s uncle pays her $34.25, which equation shows how you could determine the number of pins Fiona knocked down?
F \frac{0.25}{34.25} = p  G \frac{0.25}{p} = 34.25  H 34.25p = 0.25  J 0.25p = 34.25

3 Carly’s family drove 25 miles to a store and then drove from Lynchburg to Danville for h hours at 60 miles per hour. Which expression describes the distance they drove?
A 60h + 25  B 25h + 60  C 60h  D 25h

4 Todd bought some supplies for an art project. He spent $27 on a canvas and bought 5 tubes of paint. If he spent a total of $51.75, which equation can be used to determine the cost t of a tube of paint?
F 27t + 5 = 51.75  G 51.75 + 5t = 27  H 27 + 5t = 51.75  J 51.75 + 27t = 5

5 8 more than the quotient of 42 and r is which expression?
A 8 + \frac{42}{r}  B \frac{r}{42} + 8  C 42r - 8  D 8 - 42r
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.20 (continued)

6 10 less than the product of 7 and a number is 18 is which equation?
   F  $10 - 7n = 18$
   G  $7n - 10 = 18$
   H  $10 - \frac{7}{n} = 18$
   J  $\frac{7}{n} - 10 = 18$

7 The Black History Museum in Richmond charges $4 per adult. A visiting group spent an additional $47 on souvenirs. If the group spent a total of $71, which equation would you use to determine how many adults were in the group?
   A  $71 + 4p = 47$
   B  $4 + 47 = 71p$
   C  $41p + 4 = 71$
   D  $4p + 47 = 71$

8 To determine the area of a circle, you would find the product of pi and the radius squared. Which expression is this?
   F  $2\pi r$
   G  $\pi r^4$
   H  $4\pi r$
   J  $\pi r^2$

OBJECTIVE 7.21 The student will use the following algebraic terms appropriately: equation, inequality, and expression.

1 What term is defined by a mathematical sentence stating that two expressions are equal?
   A  inequality
   B  equilibrium
   C  equation
   D  expression

2 Which is an example of an inequality?
   F  $5k$
   G  $5k = 4$
   H  $5k < 4$
   J  $5k \div 4$

3 $5x - 7 \leq 8$ is an example of which term?
   A  equation
   B  inequality
   C  expression
   D  equality
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.21 (continued)

4 Which choice is an example of an expression?
   F \( \frac{1}{3}x + 7(x - 4)^2 \)
   G \( \frac{1}{3}x + 7(x - 4)^2 = 18 \)
   H \( \frac{1}{3}x + 7(x - 4)^2 \geq 18 \)
   J \( \frac{1}{3}x + 7(x - 4)^2 \leq 18 \)

5 A mathematical sentence that uses the symbols \(<, >, \leq, \text{ or } \geq\) is defined by which term?
   A equation
   B inequality
   C expression
   D equality

6 Which of the following is an example of an equation?
   F \( \frac{8}{x} + 14 \)
   G \( \frac{8}{x} + 14 \geq 12 \)
   H \( \frac{8}{x} + 14 = 12 \)
   J \( \frac{8}{x} + 14 < 12 \)

7 \( 27 = 2 - 19t \) is an example of which term?
   A inequality
   B equilibrium
   C expression
   D equation

8 Which of the following is an example of an inequality?
   F \( 4(2x - 8) \geq 5x + 7 \)
   G \( 4(2x - 8) = 5x + 7 \)
   H \( 4(2x - 8) - 5x + 7 \)
   J \( 4(2x - 8) + 5x + 7 = 0 \)
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

**OBJECTIVE 7.22a** The student will solve one-step linear equations and inequalities in one variable with strategies involving inverse operations and integers, using concrete materials, pictorial representations, and paper and pencil.

1. What is the solution to $x - 13 = 24$?
   A. 1.85  
   B. 11  
   C. 37  
   D. 312

2. What is the solution to $x + 4\frac{2}{3} = 9\frac{1}{3}$?
   F. $4\frac{1}{3}$  
   G. $4\frac{2}{3}$  
   H. $5\frac{1}{3}$  
   J. $5\frac{2}{3}$

3. What is the solution to $17 = x + 8$?
   A. 9  
   B. 11  
   C. 13  
   D. 25

4. What is the solution to $\frac{x}{8} > 4$?
   F. $x < 32$  
   G. $x < 2$  
   H. $x > 32$  
   J. $x > \frac{1}{2}$

5. What is the solution to $-3a = 12$?
   A. 15  
   B. 9  
   C. 4  
   D. -4

6. What is the solution to $b + 7 < -2$?
   F. $b < -14$  
   G. $b < -9$  
   H. $b < 5$  
   J. $b > -5$

7. Which equation has 4 as its solution?
   A. $\frac{y}{2} = -2$  
   B. $-2y = 4$  
   C. $y - 2 = -2$  
   D. $\frac{y}{8} = 2$
Standards Practice

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

OBJECTIVE 7.22b The student will solve practical problems requiring the solution of a one-step linear equation.

1 Jackson wants to buy a video game for $40. He has $22 saved up. How much more does he need to save before he can buy the game?
   A $18
   B $28
   C $32
   D $62

2 Riley needs to run at least 10 miles a week when she is training to run a marathon. This week she has run 4.2 miles. How much more does she need to run to reach her weekly goal?
   F at least 6.2 mi
   G no more than 5.8 mi
   H at least 14.2 mi
   J at least 5.8 mi

3 Sophie charged $5.50 an hour to baby-sit for her neighbors. At the end of the evening, she had made $44. How many hours did she baby-sit?
   A 6 h
   B 7 h
   C 8 h
   D 11 h

4 The men’s basketball team at Virginia State scored 15 points more than their opponent. If Virginia State scored 47 points, how many points did their opponent score?
   F 27
   G 32
   H 52
   J 62

5 Mrs. Murphy is hanging wallpaper in her kitchen. One roll of wallpaper will cover about 50 square feet. She needs to have at least 380 square feet of wallpaper. How many rolls does she need to buy?
   A no more than 8 rolls
   B at least 8 rolls
   C no more than 7 rolls
   D exactly 7 rolls

6 Barrack bought a beach umbrella for $37.95 including tax. He gave the store clerk two $20 bills. How much change did he receive?
   F $1.05
   G $1.95
   H $2.05
   J $3.05
Sample Test

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 How would you classify the figure?  

A parallelogram  
B rectangle  
C trapezoid  
D rhombus

2 Which equation matches the graph?  

F \( y = -\frac{7}{3}x + 2 \)  
G \( y = -\frac{5}{3}x + 2 \)  
H \( y = \frac{7}{3}x - 2 \)  
J \( y = 3x - 1 \)

3 Which property is illustrated by \( 9(2 \cdot 12) = (9 \cdot 2)12 \)?  

A associative property of addition  
B commutative property of addition  
C associative property of multiplication  
D commutative property of multiplication

4 A store mailed surveys to 135 customers. If a postage stamp cost 37 cents, how much did it cost the store in postage to conduct the survey?  

F $1.72  
G $12.37  
H $49.95  
J $99.90

5 Nathan mows lawns in his neighborhood for $12 a lawn. Which equation shows how many lawns \( \ell \) he will have to mow before he has $50?  

A \( 50 - \ell = 12 \)  
B \( 12 + \ell = 50 \)  
C \( 50\ell = 12 \)  
D \( 12\ell = 50 \)

Go on
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

6 Kendall has a bag that contains 8 green marbles, 8 red marbles, 3 blue marbles, and 1 yellow marble. Kendall drew a marble at random from the bag 35 times and replaced it. He drew green 14 times, red 16 times, blue 4 times, and yellow 1 time. Which statement best describes his results?
   F More trials are needed to make any conclusions.
   G Kendall must have made a mistake because the experimental and theoretical probability for choosing green match exactly.
   H The experimental probabilities approximate the theoretical probabilities very closely.
   J Kendall needs more yellow marbles in the bag.

7 A window in a house is shown. What type of polygon is it?
   A pentagon
   B hexagon
   C octagon
   D decagon

8 Which value is equivalent to $3.798 \times 10^4$?
   F 37,980,000
   G 37,980
   H 3798
   J 3,798

9 What is the solution to $18 - x = 53$?
   A -71
   B -35
   C 35
   D 71

10 Which figure shows polygon $JKLM$ with coordinates $J(-5, 5)$, $K(-2, 4)$, $L(-2, 1)$, and $M(-6, 1)$ rotated 180° about the origin?
   F
   G
   H
   J
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

11 Sterling is packing a suitcase for his trip to Alexandria. If the suitcase is a rectangular prism that measures 26 inches by 18 inches by 8 inches, what is the volume of the suitcase?
    A 52 in\(^3\)  
    B 468 in\(^3\)  
    C 3,744 in\(^3\)  
    D 29,952 in\(^3\)

12 Charles is building a model car and has several options to choose from. He can choose one body type from 4 choices, one engine type from 3 choices, and one type of wheel from 10 choices. Which shows how he would determine how many different model cars are possible?
    F \(4 \cdot 3 \cdot 10\)  
    G \(4 \cdot 13\)  
    H \(4^3 \cdot 10\)  
    J \(4 + 3 + 10\)

Use the following information to answer Questions 13 and 14.
The graph shows the average monthly high temperatures for Charlottesville for 5 months.

13 What do you predict the high temperature will be in June?
    A 95° F  
    B 83° F  
    C 77° F  
    D 75° F

14 What statement generally describes the trend in the average high temperatures?
    F For the first 5 months, the average high temperature increases.  
    G For the first 5 months, the average high temperature decreases.  
    H The temperature is pretty much the same throughout the year.  
    J It is usually cold in Charlottesville.

15 Terrance has read 45% of his book. If the book has 185 pages, how much does he have left to read?
    A 45 pages  
    B \(83\frac{1}{4}\) pages  
    C \(101\frac{3}{4}\) pages  
    D 140 pages
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

16 The frequency distribution shows the number of goals scored by a women’s soccer team in one season. Which statement summarizes the results of this data?

<table>
<thead>
<tr>
<th>Number of Goals</th>
<th>Tally</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
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<td>3</td>
</tr>
<tr>
<td>1</td>
<td>III</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>III</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>III</td>
<td>3</td>
</tr>
<tr>
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<td></td>
<td>1</td>
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</tr>
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<td>1</td>
</tr>
<tr>
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<td></td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

F  The women’s soccer team beat their opponents by a total of 21 goals.
G  The women’s soccer team scored many goals in the season.
H  Women’s soccer does not have high scoring games.
J  The women’s soccer team scored at least 1 goal most of the time.

17 Which is an equation?

A  \( \frac{2}{5} m - 1 \frac{4}{5} \)
B  \( \frac{2}{5} m - 1 \frac{4}{5} > 17 \)
C  \( \frac{2}{5} m - 1 \frac{4}{5} \leq 17 \)
D  \( 17 = \frac{2}{5} m - 1 \frac{4}{5} \)

18 Astrid is making party favors for her aunt’s wedding. She already has 43 favors made. If she makes 10 favors each day, which equation illustrates this scenario?

F  \( y = 10d + 43 \)
G  \( y = 43d + 10 \)
H  \( 43 = 10 + d \)
J  \( y = 10 + d + 43 \)

19 Simplify the expression \( 7 + 4(5 - 2)^2 \div 12 \).

A  3.58
B  8.25
C  9
D  10
Sample Test (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

20 An 8-ounce glass of vitamin D milk has 8 grams of protein. Use a proportion to determine how much protein is in a 12-ounce glass of vitamin D milk.
   F 6 g   G 8 g
   H 10 g   J 12 g

21 What are the coordinates of B?
   A (−3, −2)
   B (−2, −3)
   C (3, −2)
   D (−2, 3)

22 What point is at (2, −2)?
   F F   G G
   H H   J J

23 Which is the solution to $\frac{x}{4} \geq 8$?
   A $x \leq −32$
   B $x ≥ −32$
   C $x > −4$
   D $x < −4$

24 Which list shows the values in order from least to greatest?
   F $\frac{2}{3}, 3.76, 3.23\%, 3\frac{3}{5}$
   G $3.23\%, 3\frac{3}{5}, 3\frac{2}{3}, 3.76$
   H $3.76, 3\frac{3}{5}, 3\frac{2}{3}, 3.23\%$
   J $3\frac{3}{5}, 3\frac{2}{3}, 3.76, 3.23\%$

25 Veronica makes yellow ribbon pins. She already has $37. If she sells these pins for $1.50 each, which expression illustrates how much money she will have?
   A $37p + 1.50$
   B $1.50p + 37$
   C $1.50p − 37$
   D $1.50p = 37$
26 Jerod made a scale enlargement of a cartoon for his math class and wants to make sure the drawing is similar to the original cartoon. The scale drawing is 67.5 centimeters by 22.5 centimeters. The original cartoon is 15 centimeters by 5 centimeters. If they are similar, what ratio relates them?

\[ \frac{9}{2} \quad \frac{3}{2} \quad \frac{2}{3} \quad \frac{2}{9} \]

27 One of the men’s college basketball conferences on the Atlantic coast had teams with the following win–loss records in the 2003–2004 season: 25–4, 19–8, 22–8, 19–8, 18–9, 16–10, 15–11, 18–12, and 10–17. What is the range of the wins for these teams?

A 35 \quad B 21 \quad C 15 \quad D 13

28 Which description is that of an inequality?

F a mathematical sentence that joins two expressions with the symbols \( >, <, \geq, \) or \( \leq \)

G a mathematical sentence that equates two expressions

H a mathematical statement

J a mathematical statement that joins two expressions with \( = \)

29 Which scenario about Chloe’s dinner matches the tree figure?

A Chloe chose 1 appetizer from 4, 1 salad from 3, and one entree from 6.

B Chloe had the appetizer, the salad, and entree from a choice of 2.

C Chloe chose 1 appetizer from 2, 1 salad from 2, and one entree.

D Chloe had the appetizer, chose 1 salad from 3, and 1 entree from 2.

30 What value is the multiplicative inverse of \( \frac{7}{9} \)?

F \( -\frac{9}{7} \) \quad G \( -\frac{7}{9} \) \quad H \( \frac{7}{9} \) \quad J \( \frac{9}{7} \)

31 If you draw a heptagon, how many sides will it have?

A 5 \quad B 7 \quad C 9 \quad D 10
Use the figure of Myra’s patio to answer Questions 32 and 33.

32 Myra’s patio is being replaced. She plans to have concrete poured in this shape. What is the area of the patio?
   F 185 ft²  G 151 ft²  H 134 ft²  J 127 ft²

33 When the patio is complete, Myra plans to place flower containers along the perimeter of the patio. How long is the perimeter?
   A 57 ft  B 38.5 ft  C 34.5 ft  D 28.5 ft

34 Elisha can type 45 words per minute. Which function rule models how many words she types?
   F \( y = 45 + x \)  G \( y = 45x \)  H \( y = \frac{x}{45} \)  J \( y + 45 = x \)

35 \( 16 - 4\left(\frac{x}{2} + 9\right) > 10 \) is an example of which mathematical term?
   A equation  B expression  C inequality  D equality

36 Monique went to the mall and bought a dress for the spring dance for $85. If the sales tax in Virginia is 4.5%, what was the total cost of the dress?
   F $88.83  G $88.40  H $81.17  J $3.83

37 Which figure can best be described as a parallelogram?
Sample Test (continued)

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

38 Shenandoah National Park has 101 miles of hiking trails. Jordie has already hiked 22 miles and is planning on hiking 15 miles per day. Which equation shows how long it will take Jordie to hike a total of 53 miles?

F \[22 + 15h = 101\]  
G \[15 + 22h = 53\]  
H \[22 + 15h = 53\]  
J \[53 + 15h = 101\]

39 Doug takes care of his neighbor’s pets for $6.25 a day. When the neighbors come back from vacation, Doug will be paid $43.75. How many days will he take care of his neighbor’s pets?

A 38  
B 21  
C 12  
D 7

40 Which choice illustrates the multiplicative property of zero?

F \[\frac{7}{8} \cdot \frac{8}{7} = 1\]  
G \[\frac{7}{8} \cdot 0 = 0\]  
H \[\frac{7}{8} \cdot \left(-\frac{7}{8}\right) = 0\]  
J \[\frac{7}{8} - \frac{7}{8} = 0\]

41 The highest temperature in Louisa yesterday was 64° F. The lowest temperature was 7° F. How much change was there between the high and the low temperatures?

A 57° F  
B 61° F  
C 67° F  
D 71° F

42 Mason wants to cover an old plastic canister with wallpaper to use to hold his paintbrushes. How much surface area will Mason cover?

F 3,799.36 cm²  
G 1,366.59 cm²  
H 949.84 cm²  
J 594.94 cm²

43 Which description is that of an equation?

A a mathematical statement  
B a mathematical sentence that joins 2 expressions with the symbols >, <, ≥, or ≤.  
C a mathematical sentence with a range of solutions  
D a mathematical sentence that sets two expressions equal
Sample Test (continued)

**Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.**

44. What are the coordinates of \( \triangle TUV \) after you translate it 5 units right and 1 unit up?
   - F \( T'(0, 4), U'(-2, -1), V'(-2, 3) \)
   - G \( T'(0, -2), U'(-2, -7), V'(-2, -3) \)
   - H \( T'(6, -2), U'(5, -7), V'(2, -3) \)
   - J \( T'(6, 0), U'(4, -5), V'(2, -1) \)

45. Tenisha wants to determine if tossing the golden dollar coin has the same experimental results as the Susan B. Anthony dollar coin. She tosses each coin 50 times. For the golden dollar she got tails 38 times and heads 12 times. For the Susan B. Anthony coin she got tails 15 times and heads 35 times. If the theoretical probability of getting tails is \( \frac{1}{2} \), which is the best conclusion Tenisha can make?
   - A Neither coin appears to be fair since neither experimental probability is close to \( \frac{1}{2} \). More trials are necessary.
   - B The golden dollar coin had approximately the opposite results as the Susan B. Anthony coin.
   - C Tenisha has performed too many trials.
   - D Tenisha has made a mistake recording the tosses.

46. Min is preparing to run in a 10-kilometer race. She plans to run \( 2\frac{1}{2} \) miles every day for training. Which equation can be used to find how many practice days it will take her to run \( 22\frac{1}{2} \) miles?
   - F \( \frac{1}{2}x = 22\frac{1}{2} \)
   - G \( 22\frac{1}{2}x = 2\frac{1}{2} \)
   - H \( x + 2\frac{1}{2} = 22\frac{1}{2} \)
   - J \( 22\frac{1}{2} + 2\frac{1}{2} = x \)

47. Amy keeps track of the time it takes her to complete her homework. The table shows her account for the past 2 weeks. What is the mode for the time Amy spent on her homework?
   - M Tu W Th F Sa Su M Tu W Th F Sa Su
   - 1 0.5 0 0.75 1.5 0 0.5 1.5 0 1 2 0.5 0.5 2
   - A 0
   - B 0.5
   - C 1
   - D 1.5
48 Which graph is a linear function of \( x \)?

49 A video store tracked their rentals for a week. The bar graph shows the results. Which set of data matches the graph?

50 What is the solution to \( \frac{1}{3}x = 12 \)?