



# MathScape

Seeing and Thinking Mathematically

Course 1

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STANDARDS	PAGE REFERENCES
<p><b>Standard 1:</b>  <b>Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.</b></p>	
<p>In grade 6, what students know and are able to do include</p>	
<p>1.1 Demonstrating meanings for integers*, rational numbers*, percents, exponents, square roots*, and pi (<math>\pi</math>) using physical materials and technology in problem-solving situations.</p>	
<p>1.1a Locate commonly used positive rational numbers* including terminating decimals through hundredths, fractions (halves, thirds, fourths, fifths, eighths, and tenths), mixed numbers, and percents on a number line.</p>	<p><b>Student Edition:</b>            108, 112-113, 118-119, 149, 212-213, 214-215, 216-217, 258  <b>Teacher's Guide:</b>            112A, 113A, 118A, 119A, 214A, 216A  <b>Quick Review Math Handbook Book 1:</b>            141</p>
<p>1.1b Use physical materials or pictures to demonstrate the meaning and equivalence of fractions, decimals, and/or percents (Example: Write the fraction, decimal, and percent value for the shaded portion of a partially shaded circle.)</p>	<p><b>Student Edition:</b>            108-109, 110-111, 147, 210-211, 232-233, 234-235, 244-245, 256, 265  <b>Teacher's Guide:</b>            108A, 109A, 110A, 233A, 244A  <b>Quick Review Math Handbook Book 1:</b>            98-101, 105, 108, 193</p>

STANDARDS	PAGE REFERENCES
1.2 Reading, writing, and ordering integers, rational numbers, and common irrational numbers* such as $\sqrt{2}$ , $\sqrt{5}$ , and $\pi$ .	
1.2a Read, write, order, and compare common fractions, decimals, and percents in a variety of forms.	<b>Student Edition:</b> 108-109, 110-111, 112-113, 114-115, 147, 148, 150, 210-211, 212-213, 214-215, 216-217, 256-258 <b>Teacher's Guide:</b> 106, 107, 109A, 110A, 111A, 115A, 210A, 214A <b>Quick Review Math Handbook Book 1:</b> 108-110, 126-131, 140-141, 154-160
1.3 Applying number theory concepts (for example, primes, factors, multiples) to represent numbers in various ways.	
1.3a Identify and use the concepts of factor, multiple, prime, composite, and square numbers.	<b>Student Edition:</b> 96-97, 98-99, 100-101, 142, 143, 144 <b>Teacher's Guide:</b> 94, 100A <b>Quick Review Math Handbook Book 1:</b> 80, 83
1.3b Describe numbers by characteristics (divisibility, even, odd, prime, composite, square).	<b>Student Edition:</b> 96-97, 98-99, 100-101, 142, 143, 144 <b>Teacher's Guide:</b> 94, 100A <b>Quick Review Math Handbook Book 1:</b> 82-84
1.4 Using the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations*.	
1.4a Demonstrate equivalence relationships among fractions, decimals, and percents in problem-solving situations (for example, two students out of eight is the same as 25%).	<b>Student Edition:</b> 232-233, 234-235, 236-237, 238-239, 240-241, 266, 267, 268, 269, 300-301 <b>Teacher's Guide:</b> 232A, 237A, 300A <b>Quick Review Math Handbook Book 1:</b> 145, 154-160, 193
1.5 Developing, testing, and explaining conjectures* about properties of integers* and rational numbers.	
1.5a Develop, test, and explain conjectures about properties of numbers (associative, commutative, identity, distributive multiplicative property of zero on whole and rational numbers).	<b>Student Edition:</b> 68-69, 132-133 <b>Quick Review Math Handbook Book 1:</b> 74-75, 262, 263, 264

STANDARDS	PAGE REFERENCES
1.6 Using number sense* to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers* such as $\sqrt{2}$ , $\sqrt{5}$ , and $\pi$ .	
1.6a Use number sense to estimate, determine, and justify the reasonableness of solutions involving whole numbers, decimals, and common fractions (only sums and differences for fractions and decimals). For example: Is $1/2 + 1/3$ closer to 0, $1/2$ , or 1?	<p><b>Student Edition:</b> 134-135, 138-139, 158, 216-217, 220-221, 259, 267, 284-285, 290-291</p> <p><b>Teacher's Guide:</b> 216A, 219, 284A, 285A, 291A</p> <p><b>Quick Review Math Handbook Book 1:</b> 72, 117, 118, 133, 138, 142, 151</p>
<p><b>Standard 2:</b> <b>Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.</b></p>	
<p>In grade 6, what students know and are able to do include</p>	
<p>2.1 Representing, describing, and analyzing patterns* and relationships using tables, graphs, verbal rules, and standard algebraic notation.</p>	
2.1a Represent, describe, and analyze geometric and numeric patterns using tables, words, symbols, concrete objects, or pictures.	<p><b>Student Edition:</b> 195, 324-325, 326-327, 328-329, 330-331, 336-337, 342-343, 348-349, 350-351, 354, 355, 356, 359, 361, 363, 364</p> <p><b>Teacher's Guide:</b> 323, 326A, 345A, 346-347, 349A, 350A</p> <p><b>Quick Review Math Handbook Book 1:</b> 393</p>
2.1b Use a variable to represent an unknown (letter, box, symbol).	<p><b>Student Edition:</b> 332-333, 334-335, 336-337, 357</p> <p><b>Teacher's Guide:</b> 332A, 337A</p> <p><b>Quick Review Math Handbook Book 1:</b> 254-257</p>
<p>2.2 Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations.</p>	
2.2a Solve problems by representing and analyzing patterns using tables, words, concrete objects, symbols, or pictures.	<p><b>Student Edition:</b> 195, 324-325, 326-327, 328-329, 330-331, 336-337, 342-343, 348-349, 350-351, 354-355, 356, 359, 361, 363, 364</p> <p><b>Teacher's Guide:</b> 323, 326A, 345A, 346-347, 349A, 350A</p> <p><b>Quick Review Math Handbook Book 1:</b> 393</p>

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2.3 Analyzing functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time).	
2.3a Predict and describe how a change in one quantity results in a change in another quantity in a linear relationship (for example, A creature gains 3 oz. a day, how much will it have gained over 10 days?)	<b>Student Edition:</b> 342-343, 344-345, 361, 362 <b>Quick Review Math Handbook Book 1:</b> 315
2.4 Distinguishing between linear and nonlinear functions* through informal investigations.	
2.4a Explain whether data presented in a chart or graph is changing at a constant rate.	<b>Student Edition:</b> 16-17, 18-19, 22-23, 26-27, 41, 42, 44 <b>Teacher's Guide:</b> 20, 21, 22A <b>Quick Review Math Handbook Book 1:</b> 188, 195, 285
2.5 Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, and graphical) and a variety of tools (physical materials, calculators, and computers).	
2.5a Solve problems using tables, concrete objects, or pictures involving linear relationships with whole numbers.	<b>Student Edition:</b> 342-343, 344-345, 361, 362 <b>Quick Review Math Handbook Book 1:</b> 285
<b>Standard 3:</b> <b>Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning and processes used in solving these problems.</b>	
In grade 6, what students know and are able to do include	
3.1 Reading and constructing displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots*, box plots*, stem-and-leaf plots*) and appropriate technology.	
3.1a Organize and construct a line graph, bar graph, and frequency table from a given set of data.	<b>Student Edition:</b> 6-7, 8-9, 10-11, 12-13, 14-15, 16-17, 18-19, 22-23, 24-25, 38, 39, 40, 41, 42, 43, 44 <b>Teacher's Guide:</b> 5, 15A, 17A, 18A <b>Quick Review Math Handbook Book 1:</b> 184-188, 190, 197

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3.1b. Read, interpret, and draw conclusions from a line graph, bar graph, circle graph, and frequency table.	<p><b>Student Edition:</b> 6-7, 8-9, 10-11, 14-15, 18-19, 22-23, 24-25, 26-27, 38, 39, 40-44, 265</p> <p><b>Teacher's Guide:</b> 7A, 11A, 14A, 15A, 19A, 20-21, 22A</p> <p><b>Quick Review Math Handbook Book 1:</b> 184-188, 191-198</p>
3.2 Displaying and using measures of central tendency*, such as mean, median, and mode, and measures of variability*, such as range and quartiles.	
3.2a Find and use measures of central tendency including mean, median, and mode.	<p><b>Student Edition:</b> 6-7, 8-9, 10-11, 18-19, 22-23, 24-25, 26-27, 30-31, 36-38, 41, 42, 44</p> <p><b>Teacher's Guide:</b> 6A, 8A</p> <p><b>Quick Review Math Handbook Book 1:</b> 183, 204-207</p>
3.2b Find and use the range from a given set of data (for example, find the range from 2 to 12. Note: range is 10).	<p><b>Student Edition:</b> 6-7, 18-19, 22-23, 24-25, 26-27, 36, 41-44</p> <p><b>Teacher's Guide:</b> 6A</p> <p><b>Quick Review Math Handbook Book 1:</b> 183, 208</p>
3.3 Evaluating arguments that are based on statistical claims.	<p><b>Student Edition:</b> 6-7, 15-16, 18-19, 22-23, 26-27, 36, 38, 39, 44</p> <p><b>Teacher's Guide:</b> 16A, 19A, 23A, 26A</p> <p><b>Quick Review Math Handbook Book 1:</b> 202</p>
3.4 Formulating hypotheses, drawing conclusions, and making convincing arguments based on data analysis.	
3.4a Analyze data and draw conclusions to predict outcomes based on data displays such as line graphs, bar graphs, or frequency tables.	<p><b>Student Edition:</b> 6-7, 8-9, 10-11, 16-17, 18-19, 22-23, 24-25, 26-27, 36-44</p> <p><b>Teacher's Guide:</b> 7A, 8A, 10A, 16A, 19A, 25A</p> <p><b>Quick Review Math Handbook Book 1:</b> 190-198, 202</p>

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3.5 Determining probabilities through experiments or simulations.	<b>Student Edition:</b> 30-31, 32-33, 34-35, 45, 46, 47 <b>Teacher's Guide:</b> 30A, 32A <b>Quick Review Math Handbook Book 1:</b> 218-222
3.6 Making predictions and comparing results drawn from real-world problems*.	using both experimental and theoretical probability
3.6a Using a chance device, such as a number cube or spinner, design a fair game and an unfair game, and explain why they are fair and unfair respectively.	<b>Student Edition:</b> 30-31, 32-33, 34-35, 45, 46, 47 <b>Teacher's Guide:</b> 30A, 34A <b>Quick Review Math Handbook Book 1:</b> 210, 218-221
3.6b Make predictions based on data obtained from simple probability experiments.	<b>Student Edition:</b> 32-33, 34-35, 45, 46 <b>Teacher's Guide:</b> 32A, 33A <b>Quick Review Math Handbook Book 1:</b> 219-223
3.6c Describe an event as likely or unlikely and explain the degree of likelihood using words such as certain, very likely, not likely, or impossible.	<b>Student Edition:</b> 30-31, 45 <b>Teacher's Guide:</b> 29, 31A <b>Quick Review Math Handbook Book 1:</b> 203, 225
3.7 Using counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken).	
3.7a Determine the number of possible outcomes for simple events using a variety of methods, such as organized lists or tree diagrams.	<b>Student Edition:</b> 30-31, 32-33, 142 For references of diagrams and lists, see Glencoe's <i>Mathscape: Seeing and Thinking Mathematically Course 3</i> © 2005 pages 27, 29 <b>Teacher's Guide:</b> 29A <b>Quick Review Math Handbook Book 1:</b> 210, 211, 212, 223

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<p><b>Standard 4:</b>  <b>Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.</b></p> <hr/> <p>In grade 6, what students know and are able to do include</p>	
<p>4.1 Constructing two- and three-dimensional models using a variety of materials and tools.</p>	<p><b>Student Edition:</b>  166-167, 168-169, 170-171, 176-177, 178-179, 186-187, 188-189, 190-191, 192-193, 194, 196, 199, 201, 204</p> <p><b>Teacher’s Guide:</b>  163G, 163H, 164, 166A, 167A, 176A, 188A, 189A, 193A</p> <p><b>Quick Review Math Handbook Book 1:</b>  388-392</p>
<p>4.2 Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures.</p>	
<p>4.2a Identify, compare, and analyze the attributes of two- and three-dimensional shapes and develop vocabulary to describe these attributes (for example, acute, obtuse, right angle, parallel lines, perpendicular lines, intersecting lines, and line segments).</p>	<p><b>Student Edition:</b>  166-167, 172-173, 174-175, 176-177, 178-179, 180-181, 182-183, 186-187, 188-189, 192-193, 198, 200, 205</p> <p><b>Teacher’s Guide:</b>  167A, 173A, 176A, 177A, 180A, 184, 185, 187A</p> <p><b>Quick Review Math Handbook Book 1:</b>  391</p>
<p>4.2b Make and test conjectures about geometric relationships and develop logical arguments to justify conclusions.</p>	<p><b>Student Edition:</b>  166-167, 168-169, 170-171, 172-173, 182-183, 186-187, 190-191, 192-193</p> <p><b>Teacher’s Guide:</b>  168A, 169A, 171A, 182A, 186A</p> <p><b>Quick Review Math Handbook Book 1:</b>  391</p>
<p>4.3 Applying the concept of ratio, proportion, and similarity* in problem-solving situations.</p>	<p><b>Student Edition:</b>  176-177, 178-179, 180-181, 182-183, 198, 199, 200, 236-237, 282-283, 290-291, 300-301, 306-307, 309, 312, 316, 319</p> <p><b>Teacher’s Guide:</b>  176A, 177A, 178A, 180A, 278, 279, 283A, 291A, 300A</p> <p><b>Quick Review Math Handbook Book 1:</b>  393</p>

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4.4 Solving problems using coordinate geometry*.	
4.4a Plot points on a coordinate graph in quadrant 1.	<b>Student Edition:</b> 340-341, 342-343, 360 <b>Quick Review Math Handbook Book 1:</b> 282-284
4.4b Draw a graph (in quadrant 1) from a given scenario or table.	<b>Student Edition:</b> 340-341, 342-343, 348-349, 360, 364 <b>Quick Review Math Handbook Book 1:</b> 282-284
4.5 Solving problems involving perimeter and area in two dimensions, and involving surface area and volume* in three dimensions.	
4.5a Solve problems involving the perimeter of polygons.	<b>Student Edition:</b> 182-183, 201, 312 (#18), 313 <b>Teacher's Guide:</b> 182A <b>Quick Review Math Handbook Book 1:</b> 402
4.5b Solve problems involving areas of polygons (square, rectangle, parallelogram, rhombus, triangle).	<b>Student Edition:</b> 158, 182-183, 201, 284-285, 313 <b>Quick Review Math Handbook Book 1:</b> 403
4.6 Transforming geometric figures using reflections*, translations*, and rotations* to explore congruence.	
4.6a Identify congruent shapes using reflections, rotations, and translations.	<b>Student Edition:</b> 168-169, 170-171, 195, 196 <b>Teacher's Guide:</b> 169A <b>Quick Review Math Handbook Book 1:</b> 393
4.6b Show lines of symmetry on a two-dimensional figure.	This standard is addressed in Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 2</i> © 2005. <b>Student Edition:</b> 279, 290-291, 304, 309 <b>Quick Review Math Handbook Book 1:</b> 314, 393 could be used as an illustration

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<p><b>Standard 5:</b>  <b>Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning involved in solving these problems.</b></p> <hr/> <p>In grade 6, what students know and are able to do include</p> <hr/> <p>5.1 Estimating, using, and describing measures of distance, perimeter, area, volume, capacity*, weight, mass, and angle comparison.</p>	
<p>5.1a Determine the appropriate unit of measure, metric and customary, when estimating distance, capacity, and weight.</p>	<p><b>Student Edition:</b>  284-285, 294-295, 296-297, 304-305, 306-307  <b>Quick Review Math Handbook Book 1:</b>  352-353, 362, 364</p>
<p>5.1b Estimate and use standard and/or metric units for length, weight, and temperature.</p>	<p><b>Student Edition:</b>  284-285, 286-287, 290-291, 292-293, 304-305, 310  <b>Quick Review Math Handbook Book 1:</b>  356, 357</p>
<p>5.1c Estimate the area of a polygon.</p>	<p><b>Student Edition:</b>  182-183, 201, 284-285  <b>Teacher's Guide:</b>  182A  <b>Quick Review Math Handbook Book 1:</b>  324</p>
<p>5.2 Estimating, making, and using direct and indirect measurements to describe and make comparisons.</p>	
<p>5.2a Estimate, make, and use direct and indirect measurements to describe and make comparisons.</p>	<p><b>Student Edition:</b>  280-281, 284-285, 286-287, 290-291, 300-301  <b>Quick Review Math Handbook Book 1:</b>  368, 369, 370, 371</p>
<p>5.3 Reading and interpreting various scales including those based on number lines, graphs, and maps.</p>	
<p>5.3a Read and interpret scales on number lines, graphs, and maps.</p>	<p><b>Student Edition:</b>  280-281, 282-283, 284-285, 286-287, 288, 290-291, 292-293, 296-297, 300-301, 302-303, 306-307, 308, 309, 310, 311, 312, 317, 319  <b>Teacher's Guide:</b>  279, 298  <b>Quick Review Math Handbook Book 1:</b>  368, 369, 370</p>

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5.3b Select an appropriate scale for a given problem (for example, using the appropriate scale when setting up a graph or determining the order of numbers on a number line).	<p><b>Student Edition:</b> 278-279, 280-281, 282-283, 286-287, 290-291, 292-293, 302-303, 308, 309, 310, 311, 317</p> <p><b>Teacher's Guide:</b> 278-279</p> <p><b>Quick Review Math Handbook Book 1:</b> 368, 369</p>
5.4 Developing and using formulas and procedures to solve problems involving measurement.	
5.4a Use formulas and/or procedures to solve problems involving the perimeter of a polygon.	<p><b>Student Edition:</b> 182-183, 201, 312 #18, 313 #19, #20, 319 #9</p> <p><b>Teacher's Guide:</b> 182A</p> <p><b>Quick Review Math Handbook Book 1:</b> 320-323, 350, 372</p>
5.4b Use formulas and/or procedures to solve problems involving the area of squares, rectangles, parallelograms, rhombuses, and triangles.	<p><b>Student Edition:</b> 182-183, 201, 284-285, 315, 319</p> <p><b>Teacher's Guide:</b> 182A</p> <p><b>Quick Review Math Handbook Book 1:</b> 324-328, 372</p>
5.5 Describing how a change in an object's linear dimensions affects its perimeter, area, and volume.	
5.5a Demonstrate how changing one of the dimensions of a rectangle or triangle affect its perimeter and area using concrete materials or graph paper.	<p><b>Student Edition:</b> 182-183, 201, 312 #18, 314 #11-#13</p> <p><b>Teacher's Guide:</b> 182A</p> <p><b>Quick Review Math Handbook Book 1:</b> 320-323, 324-328, 350, 370, 372</p>
5.6 Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation.	<p><b>Student Edition:</b> 284-285, 286-287, 290-291, 292-293, 304-305, 306-307, 312, 318, 319</p> <p><b>Teacher's Guide:</b> 286A</p> <p><b>Quick Review Math Handbook Book 1:</b> 354, 355</p>

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<p><b>Standard 6:</b>  <b>Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning involved in solving these problems.</b></p>	
<p>In grade 6, what students know and are able to do include</p>	
<p>6.1 Using models to explain how ratios, proportions, and percents can be used to solve real-world problems.</p>	
<p>6.1a Use concrete materials or pictures to determine commonly used percentages (for example, 25%, 50%) in problem-solving situations.</p>	<p><b>Student Edition:</b>  232-233, 234-235, 236-237, 238-239, 265, 266, 268, 269</p> <p><b>Teacher's Guide:</b>  230-231, 232A</p> <p><b>Quick Review Math Handbook Book 1:</b>  141, 145-150</p>
<p>6.2 Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers.</p>	
<p>6.2a Demonstrate conceptual meaning of addition and subtraction of fractions and decimals in problem-solving situations.</p>	<p><b>Student Edition:</b>  109, 118-119, 120-121, 122-123, 124-125, 126-127, 128, 129, 210-211, 220-221, 260</p> <p><b>Teacher's Guide:</b>  118A, 207G, 220A, 221A</p> <p><b>Quick Review Math Handbook Book 1:</b>  119, 131</p>
<p>6.2b Use and explain strategies to add/subtract decimals and fractions in problem solving situations (common fractions with like and unlike denominators, mixed numbers, and decimals to thousandth).</p>	<p><b>Student Edition:</b>  118-119, 120-121, 219, 220-221, 260</p> <p><b>Teacher's Guide:</b>  119A, 120A</p> <p><b>Quick Review Math Handbook Book 1:</b>  119, 131, 139</p>
<p>6.2c Find equivalent representations by decomposing and composing whole numbers [for example, <math>48 \times 12 = (48 \times 10) + (48 \times 2)</math>].</p>	<p><b>Student Edition:</b>  81, 98-99, 142, 143</p> <p><b>Teacher's Guide:</b>  98A, 99A</p> <p><b>Quick Review Math Handbook Book 1:</b>  76</p>

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6.2d Demonstrate proficiency with the four basic operations using whole numbers.	<b>Student Edition:</b> 102-103, 104-105, 145, 146 <b>Teacher's Guide:</b> 102A, 104A <b>Quick Review Math Handbook Book 1:</b> 68
6.3 Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explain why an estimate may be acceptable in place of an exact answer.	
6.3a Develop, apply, and explain a variety of different estimation strategies in problem-solving situations and explain why an estimate may be acceptable in place of an exact answer.	<b>Student Edition:</b> 216-217, 219, 220-221, 259 <b>Teacher's Guide:</b> 216A <b>Quick Review Math Handbook Book 1:</b> 72, 354
6.4 Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic*, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable.	
6.4a Apply appropriate computation methods to solve problems involving whole numbers, common fractions, and decimals (use only addition and subtraction of fractions and decimals).	<b>Student Edition:</b> 114-115, 130-131, 134-135, 219, 224-225 <b>Teacher's Guide:</b> 95, 115A, 131A, 137A <b>Quick Review Math Handbook Book 1:</b> 68, 77, 97
6.4b In a problem-solving situation, determine whether the results are reasonable and justify those results with accurate computation.	<b>Student Edition:</b> 104-105, 146, 240-241, 269 #13, 328-329, 348-349, 356, 363, 365 <b>Quick Review Math Handbook Book 1:</b> 72, 354