



Geometry

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STANDARDS		PAGE REFERENCES
Numbers, Number Sense, and Computation		
<p><i>Content Standard 1.0: To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate, use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.</i></p>		
<p>By the end of Grade 12, students know and are able to do everything required in the previous grades and:</p>		
<p>1.12.1</p> <p>Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms.</p> <p>S 23.12.3; C 4.12.1</p>	I/S	<p>Student Edition:</p> <p>5 #5-#12, 58 #2, 122 #1, 281 #11-#13, 338 #1, 341 #9-#12, 593 #7-#12, 734-735, 744-745</p>
<p>1.12.2</p> <p>Apply the laws of exponents to perform operations on expressions with integral exponents and expressions in scientific notation.</p> <p>S 1.12.2</p>	W/L	<p>Student Edition:</p> <p>5 #11-#12, 122 #1, 281 #11-#13, 341 #10-#11, 687 #11-#14</p>

STANDARDS		PAGE REFERENCES
1.12.3 Apply the properties and theories of the real number system to everyday situations. S 1.12.2; H 3.12.4	I/S	Student Edition: 58 #3, 94-95, 232 #1, 247, 278 #1, 284 ex 4, 596 ex 2, 734-735, 746-747, 750-751
1.12.5 Perform simple operations on matrices .	W/L	Student Edition: 461 #13-#16, 505 #73-#78, 506-511, 516 #42-#47, 517 #10-#12, 716 ex 4, 752-753 Teacher Wraparound Edition: A 511; DI 509
Patterns, Functions, and Algebra		
<i>Content Standard 2.0: To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.</i>		
2.12.2 Represent and solve problems using discrete structures including graphs and matrices, with and without technology. Ec 3.12.2; H 4.12.1; H 5.12.1	E/L	Student Edition: 278 #4, 461 #13-#16, 505 #73-#78, 506-511, 516 #42-#47, 517 #10-#12, 716 ex 4, 752-753, 790 #11-#14 Teacher Wraparound Edition: A 511; DI 509
2.12.3 Create and use different forms of a variety of equations, proportions, and/or formulas (e.g., $I=PRT$ or $R=I/PT$), solving for the needed variable as necessary in given situations. H 3.12.4; H 4.12.1; S 1.12.2; S 1.12.4; S 20.12.1; S 23.12.2	E/S	Student Edition: 282-287, 297 #70-#72, 306 #53-#56, 333 #10-#17, 337 #4-#6, 604 ex 4 <i>Geometry Activity</i> 601, 611 <i>Key Concept</i> 596, 603, 610, 650, 655, 656, 661 Teacher Wraparound Edition: A 287; DI 283; TNT 284; TT 283
2.12.4 Add, subtract, multiply, and factor (1^{st} and 2^{nd} degree) polynomials , describing each step in the process and the connection between the algebraic process and the arithmetic process; use simple quadratic equations with integer roots to solve practical and mathematical problems. H 3.12.4; H 4.12.1; S 23.12.2	I/S	Student Edition: 58 #3, 94-100, 521 #10-#13, 746-747, 748-749, 750-751 Teacher Wraparound Edition: A 100; DI 96

STANDARDS		PAGE REFERENCES
2.12.5 Model practical problems from everyday situations with a variety of models that includes matrices, translating among tabular, symbolic and graphical representations of functions, with and without technology. Ec 3.12.2; Ec3.12.3; Ec 3.12.4; Ec 6.12.6; G 1.12.3; H 3.12.4; H 4.12.1; S 1.12.2	E/S	Student Edition: 58 #6, 74 #55, 147 ex 5, 149 #45-#51, 171 #24, 331 #47, 501 ex 5, 509 #13-#14, 658 #29, 670 #35
2.12.6 Determine the domain and range of linear relations given a graph or a set of ordered pairs ; explain their importance in problem-solving situations. H 5.12.1	W/L	See Glencoe's <i>Algebra 2</i> © 2005 Student Edition: 56-62
2.12.7 Solve systems of two linear equations, both algebraically and graphically; use graphing calculators as a primary tool in solving these problems and to verify solutions found by other methods.	W/L	Student Edition: 59 #11, 158, 161 ex 3, 241 ex 3, 243 #7-#9, 244 #27, 616 #58, 742-743 <i>Study Tip</i> 242
Measurement		
Content Standard 3.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.</i>		
3.12.1 Convert between customary and metric systems; convert among monetary systems.	I/L	Student Edition: 730-731
3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass. S 2.12.1	I/S	Student Edition: 13-19 Teacher Wraparound Edition: A 19; DI 14

STANDARDS		PAGE REFERENCES
3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and tolerance in measurement; describe how each of these can affect solutions found in problem situations. S 23.12.8	I/S	Student Edition: 13-19 <i>Study Tip</i> 596 Teacher Wraparound Edition: A 19
3.12.4 Use and interpret consumer data (e.g., amortization tables , tax tables, and compound interest charts) to make informed financial decisions related to practical applications such as budget. E 4.12.3; Ec 2.12.4; Ec 2.12.5; Ec 2.12.8; Ec 2.12.12	I/L	Student Edition: 327 ex 5, 328 #10, 329 #38, 787 #13
3.12.5 Use relationships (e.g., proportions) and formulas (indirect measurement) to determine the measurement of unknown dimensions, angles, areas, and volumes to solve problems. S 2.12.1; S 23.12.4	I/S	Student Edition: 21-22, 285 #9-#10, 291 ex 3, 293 #8, 300 #3, 354 #11, 369 #59-#60, 371-376, 379 #3, 381 #15, 382 #38-#39, 598 #9-#14, 606 #30-#35, 692 #7-#16, 713 #52-#53 Teacher Wraparound Edition: A 376; DI 372
Spatial Relationships and Geometry		
Content Standard 4.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will identify, represent, explain, verify, and apply spatial relationships and geometric properties.</i>		
4.12.1 Identify and use the properties of polygons (including interior and exterior angles) and elements of circles (e.g., angles, arcs, chords , secants and tangents) to solve practical problems. H 3.12.4	I/S	Student Edition: 407 #19-#20, 408 #43, 531 ex 3, 533 #13, 534 #53, 541 #44, 546 ex 3, 549 #7, 555 #7, 557 #28

STANDARDS		PAGE REFERENCES
4.12.5 Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines and find possible solutions to sets of equations; use algebraic techniques to solve problems determined by geometric relationships. H 5.12.1	I/S	Student Edition: 139-144, 146 ex 3, 148 #27-#34, 154 ex 4, 156 #38-#39, 164 #39-#43, 169 #23-#28, 180 ex 4, 201 ex 2, 241 ex 3
4.12.6 Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve practical problems. H 3.12.4	W/S	Student Edition: 39 ex 2, 107-114, 120 #55-#58, 121 #13-#15, 133-138, 784 #2-#10 <i>Geometry Software Investigation</i> 132 Teacher Wraparound Edition: A 138; DI 134; GA 110
4.12.7 Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems. H 3.12.4	I/S	Student Edition: 350-356, 357-363, 368 #17, 369 #50-#51, 376 #39, 383 #44-#45, 390 #50, 788 #10 Teacher Wraparound Edition: A 356; DI 352
4.12.8 Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate the properties of geometric figures.	W/L	Student Edition: <i>Construction</i> 24, 31, 33, 200, 207, 425, 433, 554 <i>Geometry Software Investigation</i> 343, 384
4.12.9 Construct, justify and defend mathematical conclusions using logical, sequential, deductive reasoning supported by established mathematical principles. E 10.12.4	E/S	Student Edition: 82-87, 89-93, 94-100, 101-106, 107-114, 117 #25-#29, 118 #30-#38 <i>Geometry Activity</i> 88 Teacher Wraparound Edition: DI 96; H 94

STANDARDS		PAGE REFERENCES
Data Analysis		
Content Standard 5.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.</i>		
5.12.1 Use calculators and computers to create and manipulate tables, graphs, and matrices to communicate statistical information; use the shape of graphs of normal distributions to compare and analyze information. G 3.12.4; G 4.12.1; G 7.12.3; H 2.12.2; H 2.12.3; S 22.12.2	I/L	Student Edition: <i>WebQuest 23</i>
5.12.2 Design, conduct, analyze, and communicate the results of multi-stage probability experiments. H 5.12.1	I/L	Teacher Wraparound Edition: <i>A 627</i>
5.12.3 Distinguish between and apply permutations and combinations using a variety of methods, including The Fundamental Counting Principle. H 5.12.1	W/L	Student Edition: 265 #48, 278 #4
5.12.4 Select and use the measures of central tendency such as mean, median, mode and variability including range, distribution and possible outliers that are appropriate for given situations. G 7.12.4; S 20.12.4	E/S	Student Edition: 114 #45, 245 #35-#38, 254 #60

STANDARDS		PAGE REFERENCES
5.12.5	E/S	Student Edition: 143 #39-#41, #44-#46, 173 #15, 296 #56-#58, 339 #13, 399 #9-#10
Analyze the validity of statistical conclusions noting various sources of bias, misuse, and abuse of data caused by a wide variety of factors including choices of scale, probability versus odds, inappropriate uses of measures of central tendency, inaccurate curve fitting and inappropriate uses of controls or sample groups.		
S 19.12.1; S 21.12.2; S 21.12.3; S 23.12.6		
5.12.6	I/L	Student Edition: <i>WebQuest</i> 164
Design, construct, analyze, and select an appropriate type of graph to represent data to communicate the results of statistical experiments (e.g., write a survey question and analyze and communicate the findings).		
S 22.12.2		
Problem Solving		
<i>Process Standard 6.0: Students will develop their ability to solve problems by engaging in developmentally appropriate problem-solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and integrate mathematical reasoning, communication and connections.</i>		
6.1	E/S	Student Edition: 26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43
Select, modify, develop, and apply strategies to solve a variety of mathematical and practical problems and to investigate and understand mathematical concepts.		
S 1.2.3; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.2; S 1.12.4; S 2.12.1; S 3.2.3; S 10.5.2; S 14.8.6; S 19.12.2; S 21.3.1		
6.2	E/S	Student Edition: 26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43
Apply previous experience and knowledge to new problem-solving situations.		

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<p>6.5</p> <p>Verify, interpret, and evaluate results with respect to the original problem situation, determining an efficient strategy for the given situation.</p> <p>S 21.5.3; S 21.12.3</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p>
<p>6.6</p> <p>Try more than one strategy when the first strategy proves to be unproductive.</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p>
<p>6.7</p> <p>Apply multi-step, integrated, mathematical problem-solving strategies, persisting until a solution is found or until it is clear that no solution exists.</p> <p>S 19.12.2</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p>
<p>6.9</p> <p>Generalize solutions and strategies from earlier problems to new problem situations.</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p>
<p>6.10</p> <p>Interpret and solve a variety of mathematical problems by paraphrasing, identifying necessary and extraneous information, selecting and justifying efficient methods and/or strategies, and ensuring the answer is reasonable.</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p>
<p>6.11</p> <p>Apply combinations of proven strategies and previous knowledge to solve non-routine problems.</p>	<p>Student Edition:</p> <p>26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43</p> <p>Teacher Wraparound Edition:</p> <p>DI 201</p>
<p>6.13</p> <p>Use technology, including calculators, to solve problems and verify solutions.</p> <p>S 24.5.5; S 24.8.5</p>	<p>Student Edition:</p> <p>26 #48-#49</p> <p><i>Graphing Calculator Investigation</i> 158</p> <p><i>Spreadsheet Investigation</i> 695, 708</p>

STANDARDS		PAGE REFERENCES
6.14 Use technology, including calculators, to investigate, define, and describe quantitative relationships such as patterns and functions. G 7.12.3; S 1.5.1; S 1.12.2; S 1.12.4; S 14.8.6; S 24.5.5; S 24.8.5	E/L	Student Edition: <i>Spreadsheet Investigation</i> 288, 410, 708
Mathematical Communication		
Process Standard 7.0: <i>Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and present results in written, oral and visual formats.</i>		
7.1 Discuss and exchange ideas about mathematics as a part of learning. E 10.2.3; E 10.3.3; E 10.5.3; E 10.3.1; E 10.5.1; E 10.12.1; S 23.5.2	E/L	Teacher Wraparound Edition: DI 96, 108, 134, 141, 153, 218, 257, 300, 318, 378
7.2 Use inquiry techniques (e.g., discussion, questioning, research, data gathering) to solve mathematical problems. E 4.2.3; E 10.2.2; E 10.3.2; E 10.5.2; E 10.8.2; E 11.2.1; E 11.3.1; E 11.5.1; E 11.8.1; E 11.12.1; E 11.2.2; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 21.3.1	E/L	Teacher Wraparound Edition: DI 96, 108, 134, 141, 153, 218, 257, 300, 318, 378
7.3 Read expository text to learn about mathematics. E 1.8.3; E 1.12.3; E 2.12.3; E 4.8.1; E 4.8.2; E 4.8.3	I/L	Student Edition: 156 #43, 330 #43 <i>Reading Mathematics</i> 12, 81, 199, 246, 446, 594
7.6 Interpret and solve word problems without the necessity of key words or phrases.	E/S	Student Edition: 26 #46-#47, 143 #39-#41, 149 #50-#51, 173 #15, 244 #34, 287 #41, 303 #32, 310 ex 4, 339 #13, 355 #40-#43

STANDARDS	PAGE REFERENCES
<p>7.9</p> <p>Model and explain mathematical relationships using oral, written, graphical, and algebraic methods.</p> <p>E 5.8.1; E 5.8.2; E 6.8.2; E 11.8.5; E 11.12.5; S 1.12.2; S 1.12.4; S 14.8.6; S 20.12.1; S 22.8.2; S 22.12.2</p>	<p>E/S</p> <p>Student Edition: 272 #28-#30, 442 #2 <i>Geometry Activity</i> 88 <i>Spreadsheet Activity</i> 708-709</p>
<p>7.10</p> <p>Evaluate the effectiveness of written and oral presentations of mathematics.</p> <p>S 21.5.3; S 23.5.2</p>	<p>I/L</p> <p>Student Edition: 111 #1, 128 #2, 142 #2, 188 #2, 203 #2, 251 #3, 263 #2, 284 #3</p>
<p>7.11</p> <p>Make conjectures and present arguments in discussions of mathematical ideas.</p> <p>S 21.5.3; S 23.5.3</p>	<p>E/L</p> <p>Student Edition: 62-66, 79 #46-#47, 80 #58-#61, 115 #9-#11, 116 #18-#20 <i>Reading Mathematics</i> 81</p> <p>Teacher Wraparound Edition: DI 64, 71; ICE 63</p>
<p>7.14</p> <p>Explain and evaluate thinking about mathematical ideas and solutions based on the role of definitions, properties, common rules, and symbols in solving problems.</p>	<p>I</p> <p>Student Edition: 149 #53, 164 #33, 296 #56-#58</p> <p>Teacher Wraparound Edition: A 297</p>
<p>7.15</p> <p>Use everyday language to explain thinking about strategies and solutions to mathematical problems.</p> <p>S 21.5.3; S 23.5.3</p>	<p>E/L</p> <p>Student Edition: 191 #46, 198 #37, 369 #62, 444 #41, 693 #32</p>
<p>7.16</p> <p>Express mathematical ideas and use them to define, compare, and solve problems orally and in writing.</p>	<p>E/S</p> <p>Student Edition: 25 #1, 71 #1, 84 #2, 147 #1, 284 #1, 387 #2, 613 #1, 625 #1, 657 #1, 704 #1</p>

STANDARDS		PAGE REFERENCES
7.17 Use mathematical notation to communicate and explain mathematical situations. S 21.2.1	E/L	Student Edition: 149 #53, 164 #33, 296 #56-#58 Teacher Wraparound Edition: A 297
Mathematical Reasoning		
<i>Process Standard 8.0: Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and ask questions to extend their thinking.</i>		
8.3 Construct, justify, and defend mathematical conclusions using logical arguments, in situations related to mathematics, science, and technology. E 10.12.4; G 7.12.4; S 1.8.1; S 1.8.4; S 1.12.4; S 14.8.6	I/L	Student Edition: 62-66, 67-74, 82-87, 107-114, 115 #9-#11 Teacher Wraparound Edition: DI 64
8.4 Use patterns and relationships to analyze mathematical situations; draw logical conclusions about mathematical problems. Ec 3.8.2; Ec 3.8.3; Ec 9.8.4; Ec 3.12.1; Ec 3.12.2; Ec 3.12.3; Ec 3.12.4; Ec 6.12.6; G 7.12.4; S 17.3.2	E/S	Student Edition: 62-66, 67-74, 80 #58-#61, 92 #12-#15, 115 #9-#11 Teacher Wraparound Edition: DI 71
8.5 Follow a logical argument and judge its validity. E 4.8.4; E 4.12.4	E/L	Student Edition: 67-74, 82-83, 84 #3, 86 #32, 111 #1 Teacher Wraparound Edition: DI 83
8.7 Recognize and apply deductive and inductive reasoning in both concrete and abstract contexts.	E/S	Student Edition: 62-66, 82-87, 89-93, 101-106, 107-114, 117 #25-#29
8.8 Ask questions to reflect on, clarify, and extend thinking.	E/L	Student Edition: 93 #32, 99 #34-#35, 130 #55, 138 #44, 144 #48, 157 #44

STANDARDS		PAGE REFERENCES
8.9	I/L Review and refine the assumptions and steps used to derive conclusions in mathematical arguments.	Student Edition: 62-66, 67-74, 117 #25-#29
8.10	I/L Construct valid arguments; make and test conjectures about algebraic and geometric properties based on mathematical principles. E 10.12.4	Student Edition: 82-87, 89-93, 94-100, 101-106, 107-114, 117 #25-#29, 118 #30-#38 <i>Geometry Activity</i> 88 Teacher Wraparound Edition: DI 96; H 94
Mathematical Connections		
<i>Process Standard 9.0: Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between context strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.</i>		
9.1	E/L Link new concepts to prior knowledge.	Teacher Wraparound Edition: BPK 90, 161, 187; TNT 31
9.2	E/S Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics.	Student Edition: 10 #29, 23 ex 5, 32 ex 3, 39 ex 2, 245 #35-#38, 254 #60-#61, 296 #56-#58, 653 #34-#36
9.3	E/S Use models to explain the relationship of concepts to procedures. S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 20.5.1	Student Edition: <i>Geometry Software Investigation</i> 51-52, 101, 132, 343, 384, 448, 477, 552 <i>Graphing Calculator Investigation</i> 158
9.4	I/L Use the connections among mathematical topics to develop multiple approaches to problems. S 20.8.1	Student Edition: 282-287, 291 ex 3, 300 ex 2, 572 #56-#57

STANDARDS		PAGE REFERENCES
<p>9.6</p> <p>Use and analyze the connections between Mathematics and other disciplines.</p> <p>Ec 2.8.2; Ec 2.12.4; Ec 2.12.8; H 2.8.3; H 2.12.3; S 2.12.1; S 14.12.5</p>	I/L	<p>Student Edition:</p> <p>93 #38, 330 #39-#40, 371-376, 405 ex 1, 504 #54, 579 #42, 614 #34-#35, 620 #23</p>
<p>9.7</p> <p>Apply mathematical thinking and modeling to solve problems that arise in other disciplines (e.g., rhythm in music and motion in science).</p> <p>S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 19.12.2</p>	E/L	<p>Student Edition:</p> <p>93 #38, 330 #39-#40, 371-376, 405 ex 1, 504 #54, 579 #42, 614 #34-#35, 620 #23</p>
<p>9.8</p> <p>Identify, explain, and use mathematics in everyday life.</p> <p>Ec 2.3.2; Ec 2.12.12; Ec 5.2.1; Ec 5.3.1; S 24.12.2</p>	I/S	<p>Student Edition:</p> <p>19 #51, 43 #40, 50 #37, 66 #42, 74 #53, 79 #49, 93 #32, 130 #55, 138 #44, 164 #33</p>