



Geometry

Concepts and Applications

© 2008

STANDARDS	PAGE REFERENCES
<p>Process Standard A: Students will develop their ability to solve problems by engaging in developmentally appropriate opportunities where there is a need to use various approaches to investigate and understand mathematical concepts in order to:</p> <ul style="list-style-type: none"> • Formulate their own problems • Find solutions to problems from everyday situations • Develop and apply strategies to solve a variety of problems • Integrate mathematical reasoning, communication and connections 	
<ul style="list-style-type: none"> • Generalize solutions and apply previous knowledge to new problem solving situations 	<p>Student Edition: 4-9, 21 #8, middle of page 123 <i>Graphing Calculator Explanation</i> 193, 316-317 <i>Hands-On Geometry</i> 76, 104, 210, 262, 283 <i>Investigation</i> 10-11, 154-155, 208-209, 288-289 Teacher Wraparound Edition: A 11</p>
<ul style="list-style-type: none"> • Determine an efficient strategy, verify, interpret, and evaluate the results with respect to the original problem 	<p>Student Edition: 4-9, 35-40, 60 #31, 61 #35, 67 #23, 73 #37, 81 #35, 109 #18-20, 250 #18, 326 #18, 338 #31 <i>Hands-On Geometry</i> 408 <i>Investigation</i> 102-103, 380-381 <i>Math in the Workplace</i> 115</p>
<ul style="list-style-type: none"> • Apply problem solving strategies until a solution is found or it is clear that no solution exists 	<p>Student Edition: 35-40, 104-109, 116-121, 162-167, 174-179, 193-197, 240-244, 296-300, 326 #18, 368-373, 408-412, 425-430, 440-444, 468-473, 516-521 <i>Investigation</i> 460-461</p>

STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> Interpret and solve a variety of mathematical problems by paraphrasing 	<p>The following references can be integrated into the lessons and problems to meet this objective.</p> <p>Student Edition: 477 #20, 576 #33-34, 632-637, 638-643, 644-648, 654-659, 660-665, 680 #24-26, 685 #29-30, 690 #17, 696 #17, 706 #23-24</p>
<ul style="list-style-type: none"> Identify necessary and extraneous information 	<p>The following references can be integrated into the lessons and problems to meet this objective.</p> <p>Student Edition: 4-9, 12-17, 18-22, 35-40, 56-61, 62-67, 79 #3, 104-109, 116-121, 133 #28, 147 #53-54, 148-153, 156-161, 174-179, 228-233 <i>Investigation</i> 10-11</p>
<ul style="list-style-type: none"> Check the reasonableness of a solution 	<p>Student Edition: 35-40, 56-61, 76-81, 96-101, 104-109, 116-121, 148-153, 156-161, 193-197, 240-243, 246-250, 256-261, 356-361, 362-367, 388-393, 413-418</p>
<ul style="list-style-type: none"> Apply technology as a tool in problem solving situations 	<p>Student Edition: 262-267, 528-533, 564-569, 572-577 <i>Hands-On Geometry</i> 79, 112, 170, 193, 246-247, 290, 316-317, 371, 427-428, 478, 506</p>
<ul style="list-style-type: none"> Apply combinations of proven strategies and previous knowledge to solve non-routine problems 	<p>Student Edition: 22 #33, 40 #32, 60 #31, 67 #23, 73 #37, 81 #35, 121 #31, 133 #28, 173 #29, 192 #28, 232 #23, 239 #23, 250 #18, 266 #29, 287 #25</p>
<p>Process Standard B: Students will develop their ability to communicate mathematically by solving problems where there is a need to obtain information from the real world through reading, listening, and observing in order to:</p>	
<ul style="list-style-type: none"> Translate information into mathematical language and symbols Process information mathematically Present results in written, oral, and visual formats Discuss and exchange ideas about mathematics as a part of learning Read a variety of fiction and nonfiction texts to learn about mathematics Use mathematical notation to communicate and explain problems 	
<ul style="list-style-type: none"> Use a variety of techniques to solve mathematical problems 	<p>Student Edition: 29-34, 79 #3, 81 #35, 116-121, 133 #30, 151 Ex5, 153 #37-39, 174-179, 193-197, 255 #23-24, 350-355, 356-361</p>

STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> Evaluate written and oral presentations in mathematics 	<p>Student Edition: 15 #2, 32 #3, 59 #3, 79 #3, 108 #3, 171 #3, 200 #2, 212 #2, 231 #3, 265 #3, 286 #3, 319 #3, 372 #3, 411 #3, 416 #3, 465 #3, 641 #3, 643 #27, 649-653, 658 #16</p> <p>Teacher Wraparound Edition: RA 656</p>
<ul style="list-style-type: none"> Model and explain mathematical relationships using oral, written, graphic, and algebraic methods 	<p>Student Edition: 4-9, 12-17, 18-22, 50-55, 56-61, 62-67, 68-73, 104-109, 110-114, 116-121, 122-127, 128-133, 142-147, 148-153</p> <p><i>Hands-On Geometry</i> 19</p> <p><i>Investigation</i> 10-11, 154-155</p> <p>Teacher Wraparound Edition: A 17, 73</p>
<ul style="list-style-type: none"> Communicate and evaluate mathematical thinking based on the use of definitions, properties, rules, and symbols in problem solving 	<p>Student Edition: 15 #1&7, 18-22, 24-28, 54 #5, 62-67, 76-81, 100 #11-22, 104-109, 110-114, 116-121, 156-161, 162-167, 210-214, 215-219, 251-255, 256-261, 362-367, 548-553, 554-558</p>
<ul style="list-style-type: none"> Use everyday language, both orally and in writing, communicate strategies and solutions to problems using appropriate mathematical language 	<p>Student Edition: 7 #3, 15 #2, 20 #3, 108 #3, 200 #2, 231 #3, 319 #3</p> <p><i>Investigation</i> 10-11, 102-103</p> <p>Teacher Wraparound Edition: RA 7, 80, 112, 125, 158, 242, 259, 330</p>
<p>Process Standard C: Students will develop their ability to reason mathematically by solving problems where there is a need to investigate mathematical ideas and construct their own learning in all content areas in order to:</p>	
<ul style="list-style-type: none"> Reinforce and extend their logical reasoning abilities Reflect on, clarify, and justify their thinking Ask questions to extend their thinking Use patterns and relationships to analyze mathematical situations Determine relevant, irrelevant, and/or sufficient information to solve mathematical problems 	
<ul style="list-style-type: none"> Recognize and apply deductive and inductive reasoning 	<p>Student Edition: 4-10, 192 #28, 638-643, 644-648, 649-653, 654-659, 660-665</p> <p><i>Graphing Calculator Exploration</i> 193, 316-317, 559</p> <p><i>Hands-On Geometry</i> 149, 283, 408</p> <p><i>Investigation</i> 102-103, 208-209, 288-289, 380-381, 666-667</p>

STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> Review and refine the assumptions and steps used to derive conclusions in mathematical arguments 	<p>Student Edition: 638-643, 644-648, 649-653, 654-659, 660-665 <i>Investigation</i> 666-667</p> <p>Teacher Wraparound Edition: EC 665; RA 656, 662</p>
<ul style="list-style-type: none"> Make and test conjectures about algebraic and geometric properties based on mathematical principles 	<p>This objective is similar to <i>Recognize and apply deductive and inductive reasoning</i>.</p> <p>Student Edition: 4-10, 192 #28, 638-643, 644-648, 649-653, 654-659, 660-665 <i>Graphing Calculator Exploration</i> 193, 316-317, 559 <i>Hands-On Geometry</i> 149, 283, 408 <i>Investigation</i> 102-103, 208-209, 288-289, 380-381, 666-667</p>
<ul style="list-style-type: none"> Justify the validity of an argument 	<p>This objective is similar to <i>Review and refine the assumptions and steps used to derive conclusions in mathematical argument(s)</i>.</p> <p>Student Edition: 638-643, 644-648, 649-653, 654-659, 660-665 <i>Investigation</i> 666-667</p> <p>Teacher Wraparound Edition: EC 665; RA 656, 662</p>
<ul style="list-style-type: none"> Construct a valid argument 	<p>This objective is similar to <i>Review and refine the assumptions and steps used to derive conclusions in mathematical argument(s)</i>.</p> <p>Student Edition: 638-643, 644-648, 649-653, 654-659, 660-665 <i>Investigation</i> 666-667</p> <p>Teacher Wraparound Edition: EC 665; RA 656, 662</p>

STANDARDS	PAGE REFERENCES
<p>Process Standard D: Students will develop the ability to make mathematical connections by solving problems where there is a need to view mathematics as an integrated whole in order to:</p>	
<ul style="list-style-type: none"> • Link new concepts to prior knowledge • Identify relationships between content strands • Integrate mathematics with other disciplines • Allow the flexibility to approach problems in a variety of ways within and beyond the field of mathematics 	
<ul style="list-style-type: none"> • Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics 	<p>Student Edition: 76-81, 168-173, 262-267, 316-321, 327-332, 419-424, 554-558, 559-563, 564-569, 572-577 <i>Graphing Calculator Exploration</i> 170 <i>Hands-On Geometry</i> 169, 262, 312, 362, 408, 425, 559 <i>Investigation</i> 10-11</p>
<ul style="list-style-type: none"> • Explain the relationship between concepts and procedures 	<p>The following references can be integrated into the lessons and problems to meet this objective. Student Edition: 62-67, 76-81, 148-153, 162-167, 168-173, 174-179, 198-202, 228-233, 256-261, 262-267, 350-355, 362-367, 368-373, 413-418</p>
<ul style="list-style-type: none"> • Use the connections among mathematical topics to develop multiple approaches to problems 	<p>Student Edition: 79 #3, 168-173, 266 #26, 358 Ex3, 365 #2, <i>Hands-On Geometry</i> 262, 408, 425 <i>Investigation</i> 570 <i>Preparing for Standardized Tests</i> 319</p>
<ul style="list-style-type: none"> • Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as rhythm in music and motion in science 	<p>Student Edition: 21 #8, 67 #22, 200 #8, 202 #26, 243 #19, 320 #27, 360 #25, 689 #6, 702 #15-16, 706 #24 <i>Investigation</i> 10-11, 708-709 <i>Math in the Workplace</i> 301</p>
<ul style="list-style-type: none"> • Identify, explain, and apply mathematics in everyday life 	<p>Student Edition: 21 #8, 39 #11, 59 #10, 81 #34, 101 #30, 121 #30, 173 #28, 218 #10, 261 #39, 266 #30, 365 Ex3, 373 #22-24, 387 #24 <i>Investigation</i> 10-11 <i>Math in the Workplace</i> 301</p>

STANDARDS	PAGE REFERENCES
Grade 12	
1.0 Numbers, Number Sense, and Computation	
<p>Content Standard 1.0 Students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.</p> <p>At a minimum, students will maintain previous skills and attain the following:</p>	
<p>1.12.6 Determine an approximate value of radical and exponential expressions using a variety of methods.</p>	<p>Student Edition: 256-261, 262-267, 548-553, 554-558, 559-563 <i>Algebra Review</i> 718</p>
<p>1.12.7 Solve mathematical problems involving exponents and roots.</p>	<p>Student Edition: 256-261, 262-267, 548-553, 554-558, 559-563 <i>Algebra Review</i> 718 <i>Preparing for Standardized Tests</i> 46 Ex1, 47 #5, 87 #1</p>
<p>Perform addition, subtraction, and scalar multiplication on matrices.</p>	<p>See Glencoe <i>Geometry</i> ©2008. Student Edition: 798-799</p>
<p>1.12.8 Identify and apply real number properties to solve problems.</p>	<p>Student Edition: 40 #29-30, 64 Ex3, 67 #21, 104-109, 118 Ex4, 125 #8, 153 #37-39, 158 Ex4, 160 #25-28, 190 #7, 419-424, 425-430, 504-509, Introduction on 649 <i>Preparing for Standardized Tests</i> 46-47, 86-87</p>
2.0 Patterns, Functions, and Algebra	
<p>Content Standard 2.0 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 to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.</p> <p>At a minimum, students will maintain previous skills and attain the following:</p>	
<p>2.12.1 Use algebraic expressions to identify and describe the n^{th} term of a sequence.</p>	<p>The following references can be integrated into classroom discussion and activities to meet this objective. Student Edition: 4-10 (especially #38), 192 #28, <i>Investigation</i> 10-11</p>
<p>2.12.2 Isolate any variable in given equations, inequalities, proportions, and formulas to use in mathematical and practical situations.</p>	<p>Student Edition: 78 Ex3, 81 #32, 174-179, 256-261, 423 #21, 429 #14, 554-558, 559-563 <i>Preparing for Standardized Tests</i> 307 #4</p>

STANDARDS	PAGE REFERENCES
2.12.3 Add, subtract, multiply, and factor 1 st and 2 nd degree polynomials connecting the arithmetic and algebraic processes.	Student Edition: <i>Preparing for Standardized Tests</i> 451 #8
Simplify algebraic expressions, including exponents and radicals.	Student Edition: 548-553, 554-558, 559-563 <i>Preparing for Standardized Tests</i> 451 #8, 493 #4, 583 #2
2.12.4 Determine the domain and range of functions, including linear, quadratic, and absolute value, algebraically and graphically.	See Glencoe <i>Geometry</i> © 2008. Student Edition: 156-163, 164 #13, 165-170, 193 #16-#22, 195 #12-#15, 197 #10, 785, 786-787 <i>Geometry Lab</i> 171 <i>Graphing Calculator Lab</i> 155
Solve absolute value equations and inequalities both algebraically and graphically.	See Glencoe's <i>Algebra 1</i> © 2008 Student Edition: 322-327, 329-333.
2.12.5 Solve systems of two linear equations algebraically and graphically and verify solutions (with and without technology).	Student Edition: 676-680, 681-686 Teacher Wraparound Edition: EC 680, 686; OEA 680
2.12.6 Solve mathematical and practical problems involving linear and quadratic equations with a variety of methods, including discrete methods (with and without technology).	Student Edition: 62-67, 96-101, 104-109, 122-127, 128-133, 148-153, 156-161, 162-167, 228-233, 240-243, 246-250, 256-261, 310-315, 350-355
3.0 Measurement	
Content Standard 3.0 Students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.	
At a minimum, students will maintain previous skills and attain the following:	
3.12.1 Estimate and convert between customary and metric systems.	Student Edition: 56-61, 350-355, 367 #19, 611 #25 Teacher Wraparound Edition: MTL 56
3.12.2 Justify, communicate, and differentiate between precision, error, and tolerance in practical problems.	Student Edition: 56-61 Teacher Wraparound Edition: MTL 56; OEA 61

STANDARDS	PAGE REFERENCES
<p>3.12.3 Select and use appropriate measurement tools, techniques, and formulas to solve problems in mathematical and practical situations.</p>	<p>Student Edition: 56-61, 96-101, 358 Ex3, 367 #14-15, 413-418, 419-424, 425-430, 504-509, 510-515, 516-521 <i>Graphing Calculator Exploration</i> 112, 193 <i>Hands-On Geometry</i> 65, 99, 104, 149, 246</p>
<p>3.12.4 Interpret and apply consumer data presented in charts, tables, and graphs to make informed financial decisions related to practical applications.</p>	<p>See Glencoe <i>Geometry</i> © 2008. Student Edition: 567 #9, 852, 856 #8</p>
<p>3.12.5 Determine the measure of unknown dimensions, angles, areas, and volumes using relationships and formulas to solve problems.</p>	<p>Student Edition: 35-40, 50-55, 104-109, 110-114, 116-121, 122-127, 156-161, 162-167, 193-197, 419-424, 425-430, 478-482, 483-487, 504-509, 510-515, 522-527, 528-533</p>
<p>4.0 Spatial Relationships, Geometry, and Logic</p>	
<p>Content Standard 4.0 Students will identify, represent, verify, and apply spatial relationships and geometric properties to solve problems, communicate, and make connections within and beyond the field of mathematics.</p>	
<p>At a minimum, students will maintain previous skills and attain the following:</p>	
<p>4.12.1 Identify and use the parts of a circle to solve mathematical and practical problems.</p>	<p>Student Edition: 454-458, 462-467, 468-473, 474-477 <i>Math in the Workplace</i> 459 Teacher Wraparound Edition: EC 477; OEA 458</p>
<p>Identify and apply properties of interior and exterior angles of polygons to solve mathematical and practical problems.</p>	<p>Student Edition: 408-412, 425-430 <i>Hands-On Geometry</i> 408 Teacher Wraparound Edition: EC 412; OEA 412; RA 411</p>
<p>4.12.2 Apply properties of similarity through right triangle trigonometry to find missing angles and sides.</p>	<p>Student Edition: 564-569, 572-577 <i>Graphing Calculator Exploration</i> 574 <i>Investigation</i> 570-571 Teacher Wraparound Edition: EC 569; OEA 569</p>
<p>4.12.5 Determine the slope of lines using coordinate geometry and algebraic techniques.</p>	<p>Student Edition: 168-173, 174-179, 660-665 <i>Hands-On Geometry</i> 169, 170 Teacher Wraparound Edition: EC 173; OEA 173</p>

STANDARDS	PAGE REFERENCES
Identify parallel, perpendicular, and intersecting lines by slope.	Student Edition: 168-173, 174-179, 660-665 <i>Hands-On Geometry</i> 169, 170 Teacher Wraparound Edition: EC 173; OEA 173
Graph linear equations and find possible solutions to those equations using coordinate geometry.	Student Edition: 174-179
Find possible solution sets of systems of equations whose slopes indicate parallel, perpendicular, or intersecting lines.	Student Edition: 611 #27, 676-680, 681-686 Teacher Wraparound Edition: EC 680, 686; OEA 680
4.12.6 Solve problems using complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal and angles in polygons.	Student Edition: 110-114, 116-121, 122-127, 148-153, 156-161, 162-167, 408-412 <i>Hands-On Geometry</i> 408 Teacher Wraparound Edition: EC 126, 161; OEA 121; RA 125
4.12.7 Apply the Pythagorean Theorem and its converse in mathematical and practical situations.	Student Edition: 256-261, 468-473, 516-521, 554-558, 559-563 <i>Hands-On Geometry</i> 262, 388 Teacher Wraparound Edition: EC 261; MTL 256; RA 259
4.12.8 Solve problems by drawing and/or constructing geometric figures to demonstrate geometric relationships.	Student Edition: 29-34 <i>Hands-On Geometry</i> 6, 19, 31, 65, 76, 99, 107, 130-131, 162, 169, 203, 210, 228 <i>Investigation</i> 208-209
4.12.9 Formulate, evaluate, and justify arguments using inductive and deductive reasoning in mathematical and practical situations.	Student Edition: 638-643, 644-648, 649-653, 654-659, 660-665 <i>Investigation</i> 666-667 Teacher Wraparound Edition: EC 665; RA 656, 662

STANDARDS	PAGE REFERENCES
5.0 Data Analysis	
Content Standard 5.0 Students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.	
At a minimum, students will maintain previous skills and attain the following:	
5.12.1 Organize statistical data through the use of tables, graphs, and matrices (with and without technology).	Student Edition: 219 #29, 267 #34, 473 #31 <i>Preparing for Standardized Tests</i> 185 #7 & 10, 224-225, 347 #10
5.12.2 Select and apply appropriate statistical measures in mathematical and practical situations.	Student Edition: 22 #39, 418 #30, 473 #31, 605 #32 <i>Preparing for Standardized Tests</i> 224-225, 273 #9, 347 #5, 583 #3 & 8
5.12.3 Distinguish between a sample and a census.	See Glencoe's <i>Algebra 1</i> © 2008. Student Edition: 642-648.
Identify sources of bias and their effect on data representations and statistical conclusions.	See Glencoe's <i>Algebra 1</i> © 2008. Student Edition: 642-648.
Use the shape of a normal distribution to compare and analyze data from a sample.	See Glencoe's <i>Advanced Mathematical Concepts</i> © 2006. Student Edition: 918-925.
5.12.4 Apply permutations and combinations to mathematical and practical situations, including the Fundamental Counting Principle.	Student Edition: <i>Preparing for Standardized Tests</i> 138-139, 399 #7
5.12.5 Determine the probability of an event with and without replacement using sample spaces.	Student Edition: 483-487 <i>Preparing for Standardized Tests</i> 138-139, 273 #7, 347 #2, 451 #6, 545 #5
Design, conduct, analyze, and effectively communicate the results of multi-stage probability experiments.	See Glencoe <i>Geometry</i> © 2008. Student Edition: 567 #29-#31, 851 #18, 856 #8

STANDARDS	PAGE REFERENCES
5.12.6 Design, construct, analyze, and select an appropriate type of graphical representations to communicate the results of a statistical experiment.	Student Edition: 473 #31 <i>Preparing for Standardized Tests</i> 184-185
Formulate and justify inferences based on a valid data sample.	Student Edition: 219 #29, 267 #34 <i>Preparing for Standardized Tests</i> 184-185, 224-225