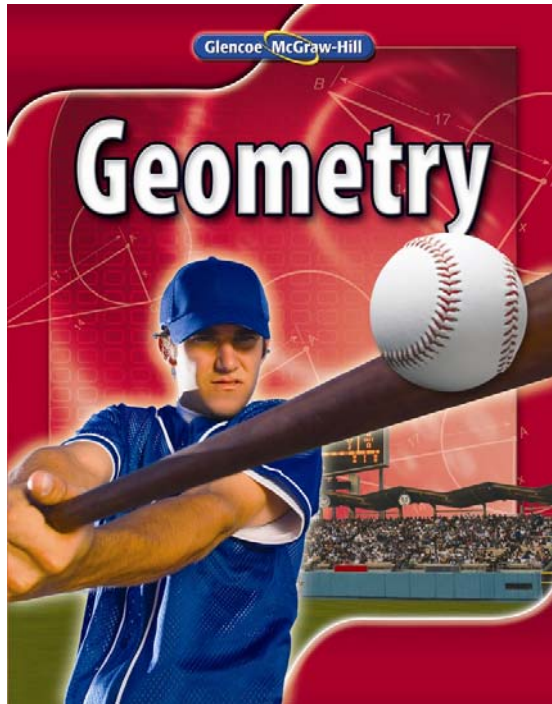




Glencoe

Model Academic Standards for  
Mathematics Grade 12



STANDARDS	PAGE REFERENCES
<b>Mathematical Processes Performance Standards A Grade 12</b>	
By the end of <b>grade twelve</b> , students will:	
<p>A.12.1 Use reason and logic to</p> <ul style="list-style-type: none"> <li>• evaluate information</li> <li>• perceive patterns</li> <li>• identify relationships</li> <li>• formulate questions, pose problems, and make and test conjectures</li> <li>• pursue ideas that lead to further understanding and deeper insight</li> </ul>	<p><b>Student Edition:</b> 89-96, 104 #54, 113 #77-#80, 115-123, 132 #55-#56, 133 #16-#17, 141 #49, 159 #11-#13, 160 #21-#23, 163 #1-#2</p> <p><b>Teacher Edition:</b> A 96, 123; AE 90, 91, 116, 117, 118; DI 92, 96, 117; F 93, 121; TWT 90, 118; WO 118</p>
<p>A.12.2 Communicate logical arguments and clearly show</p> <ul style="list-style-type: none"> <li>• why a result does or does not make sense</li> <li>• why the reasoning is or is not valid</li> <li>• an understanding of the difference between examples that support a conjecture and a proof of the conjecture</li> </ul>	<p><b>Student Edition:</b> 92 ex 4, 93 #12-#13, 94 #40-#46, 95 #47, 159 #11-#12, 116 ex 2, 117 ex 3, 118 ex 4, 119 #3-#6, 120 #16-#21, 132 #55-#56, 133 #3-#4, 160 ex 4, 163 #7</p> <p><b>Teacher Edition:</b> A 96; AE 92, 117, 118; DI 92; WO 118</p>

Codes used for Teacher Edition pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
<p>A.12.3 Analyze non-routine* problems and arrive at solutions by various means, including models* and simulations, often starting with provisional conjectures and progressing, directly or indirectly, to a solution, justification, or counter-example</p>	<p><b>Student Edition:</b> 73 #37, 131 #45, 147 #17, 193 #53, 202 #59, 251 #46, 279 #23, 340 #37, 357 #43, 396 #49, 424 #46, 433 #46, 443 #65, 462 #44, 492 #48, 501 #31, 538 #49, 559 #46, 580 #23, 590 #54</p>
<p>A.12.4 Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data</p>	<p><b>Student Edition:</b> 5-12, 149-157, 162 #43, 205-212, 222 #52, 226 #34-#39</p> <p><b>Teacher Edition:</b> A 157, 212; AE 6, 7, 150, 152, 153, 206, 207; DI 207, 208, 221; F 151, 207; TNT 150, 152, 206</p>
<p>A.12.5 Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly</p>	<p><b>Student Edition:</b> 53 #52, 63 #49, 73 #42, 95 #54, 103 #48, 112 #68, 122 #46, 131 #50, 140 #41, 147 #22, 156 #35, 175 #50, 183 #42, 193 #57, 202 #58, 211 #43, 221 #42, 241 #64, 251 #51, 260 #43</p>
<p>A.12.6 Read and understand</p> <ul style="list-style-type: none"> <li>• mathematical texts and other instructional materials</li> <li>• writing about mathematics (e.g., articles in journals) and mathematical ideas as they are used in other contexts</li> </ul>	<p><b>Student Edition:</b> <i>Reading Math</i> 6, 58, 106, 143, 153, 172, 246, 263, 324, 326, 427, 437, 458, 466, 543, 565, 585, 617, 684, 792, 803, 900, 932</p>
<p><b>Mathematics, Standard B: Number Operations And Relationships Performance Standards - Grade 12</b></p>	
<p>By the end of <b>grade twelve</b>, students will:</p>	
<p>B.12.1 Use complex counting procedures such as union and intersection of sets and arrangements (permutations* and combinations*) to solve problems</p>	<p><b>Student Edition:</b> 899-905</p> <p><b>Teacher Edition:</b> A 905; AE 900, 901; DI 900, 904; F 901; TNT 901</p>
<p>B.12.2 Compare real numbers using</p> <ul style="list-style-type: none"> <li>• order relations (&gt;,&lt;) and transitivity*</li> <li>• ordinal scales including logarithmic (e.g., Richter, pH rating)</li> <li>• arithmetic differences</li> <li>• ratios, proportions, percents, rates of change</li> </ul>	<p><b>Student Edition:</b> 187, 188 ex 1, 190 #4, 191 #26-#27, 192 #50, 342, 457-463, 473 #60, 483 #49-#52</p> <p><i>Graphing Technology Lab</i> 464</p> <p><i>Key Concept</i> 342</p> <p><b>Teacher Edition:</b> A 462; AE 188, 458, 459; DI 458, 459; T 342; TNT 458</p>

STANDARDS	PAGE REFERENCES
<p>B.12.3 Perform and explain operations on real numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)</p>	<p><b>Student Edition:</b>  P3 #60-#63, P10, P19-P20, P21 #54-#59  <i>Study Tip</i> 729  <i>Watch Out</i> P12  <b>Teacher Edition:</b>  AE P10, P19, P20; DI 459</p>
<p>B.12.4 In problem-solving situations involving the application of different number systems (natural, integers, rational*, real*) select and use appropriate</p> <ul style="list-style-type: none"> <li>• computational procedures</li> <li>• properties (e.g., commutativity*, associativity*, inverses*)</li> <li>• modes of representation (e.g., rationals as repeating decimals, indicated roots as fractional exponents)</li> </ul>	<p><b>Student Edition:</b>  P3 #60-#63, P19-P20, P21 #54-#59  <i>Study Tip</i> 136  <b>Teacher Edition:</b>  AE P19, P20</p>
<p>B.12.5 Create and critically evaluate numerical arguments presented in a variety of classroom and real-world situations (e.g., political, economic, scientific, social)</p>	<p><b>Student Edition:</b>  11 #58, 73 #37, 112 #63, 131 #45, 147 #17, 193 #53, 202 #58, 357 #43, 424 #46, 433 #46, 443 #65, 462 #44, 492 #48, 501 #31, 516 #21, 538 #49, 559 #46, 580 #23, 590 #54, 622 #45</p>
<p>B.12.6 Routinely assess the acceptable limits of error when</p> <ul style="list-style-type: none"> <li>• evaluating strategies</li> <li>• testing the reasonableness of results</li> <li>• using technology to carry out computations</li> </ul>	<p><b>Student Edition:</b>  497 ex 2, 498 #3, 499 #10, 569 #56  <i>Problem-Solving Tip</i> 661  <i>Study Tip</i> 832, 917  <b>Teacher Edition:</b>  AE 497</p>
<p><b>Mathematics, Standard C: Geometry Performance Standards - Grade 12</b></p>	
<p>By the end of <b>grade twelve</b>, students will:</p>	
<p>C.12.1 Identify, describe, and analyze properties of figures, relationships among figures, and relationships among their parts by</p> <ul style="list-style-type: none"> <li>• constructing physical models</li> <li>• drawing precisely with paper-and-pencil, hand calculators, and computer software</li> <li>• using appropriate transformations* (e.g., translations, rotations, reflections, enlargements)</li> <li>• using reason and logic</li> </ul>	<p><b>Student Edition:</b>  615-623, 624-630, 632-638, 639 #1-#2, 659 #59-#61, 660-667  <i>Geometry Lab</i> 631  <b>Teacher Edition:</b>  A 623; AE 616, 617, 618, 625, 626, 633, 634, 662, 663; DI 617, 625, 630; T 615; TWT 616, 626</p>

STANDARDS	PAGE REFERENCES
<p>C.12.2 Use geometric models* to solve mathematical and real-world problems</p>	<p><b>Student Edition:</b> 80 #42, 90 ex 2, 150 ex 2, 155 #20, 173 ex 3, 175 #45, 181 #7, 188 ex 2, 193 #55, 195 #14, 250 #33, 923 ex 1 <i>Graphing Technology Lab</i> 185 <i>Real-World Link</i> 152, 182</p> <p><b>Teacher Edition:</b> AE 90, 150, 173, 188, 265, 924</p>
<p>C.12.3 Present convincing arguments by means of demonstration, informal proof, counter-examples, or any other logical means to show the truth of</p> <ul style="list-style-type: none"> <li>statements (e.g., these two triangles are not congruent)</li> <li>generalizations (e.g., the Pythagorean* theorem holds for all right triangles)</li> </ul>	<p><b>Student Edition:</b> 253-261, 262-270, 273-280, 301-307</p> <p><b>Teacher Edition:</b> A 261, 270, 280, 307; AE 254, 255, 263, 264, 265, 266, 274, 275, 302, 303</p>
<p>C.12.4 Use the two-dimensional rectangular coordinate system* and algebraic procedures to describe and characterize geometric properties and relationships such as slope*, intercepts*, parallelism, and perpendicularity</p>	<p><b>Student Edition:</b> 189 ex 3, 190 ex 4, 191 #28-#33, 192 #34-#36, 193 #54, 194 #58, 195 #15-#16, 198 ex 5, 200 #10-#11, 201 #37-#40, 202 #50-#52, 203 #61, 222 #52, 225 #21-#25 <i>Postulates</i> 189 <i>Study Tip</i> 189</p> <p><b>Teacher Edition:</b> A 194; AE 189, 190</p>
<p>C.12.5 Identify and demonstrate an understanding of the three ratios used in right-triangle trigonometry (sine, cosine, tangent)</p>	<p><b>Student Edition:</b> 562-571, 573 #17-#20, 574-581, 582-591 <i>Graphing Technology Lab</i> 572</p> <p><b>Teacher Edition:</b> AE 563, 564, 565, 566, 575, 576, 584, 585; DI 564, 566, 575, 576; F 584; TNT 563; TWT 563</p>
<b>Mathematics Performance Standards D Grade 12</b>	
By the end of <b>grade twelve</b> , students will:	
<p>D.12.1 Identify, describe, and use derived attributes* (e.g., density, speed, acceleration, pressure) to represent and solve problem situations</p>	<p><b>Student Edition:</b> P4 ex 3, P7 ex 4, 869 #38, 883 #14, 884 #22, 885 #23</p> <p><b>Teacher Edition:</b> AE P4, P7</p>
<p>D.12.2 Select and use tools with appropriate degree of precision to determine measurements directly* within specified degrees of accuracy and error (tolerance)</p>	<p><b>Student Edition:</b> 22-24</p> <p><b>Teacher Edition:</b> A 24; WO 23</p>

STANDARDS	PAGE REFERENCES
<p>D.12.3 Determine measurements indirectly*, using</p> <ul style="list-style-type: none"> <li>estimation</li> <li>proportional reasoning, including those involving squaring and cubing (e.g., reasoning that areas of circles are proportional to the squares of their radii)</li> <li>techniques of algebra, geometry, and right triangle trigonometry</li> <li>formulas in applications (e.g., for compound interest, distance formula)</li> <li>geometric formulas to derive lengths, areas, or volumes of shapes and objects (e.g., cones, parallelograms, cylinders, pyramids)</li> <li>geometric relationships and properties of circles and polygons (e.g., size of central angles, area of a sector of a circle)</li> <li>conversion constants to relate measures in one system to another (e.g., meters to feet, dollars to Deutschmarks)</li> </ul>	<p><b>Student Edition:</b> 457-463 <i>Graphing Technology Lab</i> 464</p> <p><b>Teacher Edition:</b> A 463; AE 458, 459; DI 458; F 459</p>
<p><b>Mathematics, Standard E: Statistics and Probability Performance Standards - Grade 12</b></p>	
<p>By the end of <b>grade twelve</b>, students will:</p>	
<p>E.12.1 Work with data in the context of real-world situations by</p> <ul style="list-style-type: none"> <li>formulating hypotheses that lead to collection and analysis of one- and two-variable data</li> <li>designing a data collection plan that considers random sampling, control groups, the role of assumptions, etc.</li> <li>conducting an investigation based on that plan</li> <li>using technology to generate displays, summary statistics*, and presentations</li> </ul>	<p><b>Student Edition:</b> 91 ex 3, 93 #11, 94 #39, 104 #52</p> <p><b>Teacher Edition:</b> A 93; F 93</p>
<p>E.12.2 Organize and display data from statistical investigations using</p> <ul style="list-style-type: none"> <li>frequency distributions</li> <li>percentiles*, quartiles, deciles</li> <li>line of best fit* (estimated regression line)</li> <li>matrices</li> </ul>	<p><b>Student Edition:</b> 91 ex 39, 952-953</p> <p><b>Teacher Edition:</b> AE 91, 694</p>

STANDARDS	PAGE REFERENCES
<p>E.12.3 Interpret and analyze information from organized and displayed data when given</p> <ul style="list-style-type: none"> <li>measures of dispersion*, including standard deviation and variance</li> <li>measures of reliability</li> <li>measures of correlation*</li> </ul>	<p><b>Student Edition:</b> 694 ex 3, 696 #6, 697 #24, 954 #5</p>
<p>E.12.4 Analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, advertising, etc.</p>	<p><b>Student Edition:</b> 94 #46</p>
<p>E.12.5 Determine the likelihood of occurrence of complex events by</p> <ul style="list-style-type: none"> <li>using a variety of strategies (e.g., combinations*) to identify possible outcomes</li> <li>conducting an experiment</li> <li>designing and conducting simulations*</li> <li>applying theoretical probability</li> </ul>	<p><b>Student Edition:</b> 906-914, 915-921, 922 #7-#15, 930 #30-#31, 931-937, 938-945</p> <p><b>Teacher Edition:</b> A 914; AE 907, 908, 909, 910, 916, 917, 932, 933, 934, 939, 940, 941; DI 909, 913, 916, 932, 934; TWT 933</p>
<p><b>Mathematics, Standard F: Algebraic Relationships Performance Standards - Grade 12</b></p>	
<p>By the end of <b>grade twelve</b>, students will:</p>	
<p>F.12.1 Analyze and generalize patterns of change (e.g., direct and inverse variation) and numerical sequences, and then represent them with algebraic expressions and equations</p>	<p><b>Student Edition:</b> 89-96, 133 #1-#2, 163 #1-#2, 165 #2, 167 #12, 186-194, 195 #17-#19, 201 #43-#45, 203 #64-#66, 225 #21-#23, 227 #4-#7, 229 #1, 230 #3</p> <p><b>Teacher Edition:</b> AE 90, 91, 92, 187, 188, 189; F 93, 187; T 186; TNT 92; TWT 90, 187, 198; WO 188</p>
<p>F.12.2 Use mathematical functions* (e.g., linear*, exponential*, quadratic*, power) in a variety of ways, including</p> <ul style="list-style-type: none"> <li>recognizing that a variety of mathematical and real-world phenomena can be modeled* by the same type of function</li> <li>translating different forms of representing them (e.g., tables, graphs, functional notation*, formulas)</li> <li>describing the relationships among variable quantities in a problem</li> <li>using appropriate technology to interpret properties of their graphical representations (e.g., intercepts, slopes, rates of change, changes in rates of change, maximum*, minimum*)</li> </ul>	<p><b>Student Edition:</b> 201 #43-#45, 203 #60</p> <p><b>Teacher Edition:</b> TWT 198</p>

STANDARDS	PAGE REFERENCES
<p>F.12.3 Solve linear and quadratic equations, linear inequalities, and systems of linear equations and inequalities</p> <ul style="list-style-type: none"> <li>• numerically</li> <li>• graphically, including use of appropriate technology</li> <li>• symbolically, including use of the quadratic formula</li> </ul>	<p><b>Student Edition:</b>  196-203, 212 #48-#50, 222 #53-#56, 225 #27-#32, 227 #13-#15, 231 #13  <i>Geometry Lab</i> 204</p> <p><b>Teacher Edition:</b>  A 203, 204; AE 197, 198, 199; DI 198; F 198; TNT 197; TWT 198; WO 198</p>
<p>F.12.4 Model and solve a variety of mathematical and real-world problems by using algebraic expressions, equations, and inequalities</p>	<p><b>Student Edition:</b>  P3 #24-#41, P11-P12, P13-P14, 134-141, 157 #41-#44, 161 #29-#35, 163 #8</p> <p><b>Teacher Edition:</b>  A P12, P14; AE P11, P12, P13, P14, 135; TNT 136; TWT P14, 136; WO P11, 136</p>