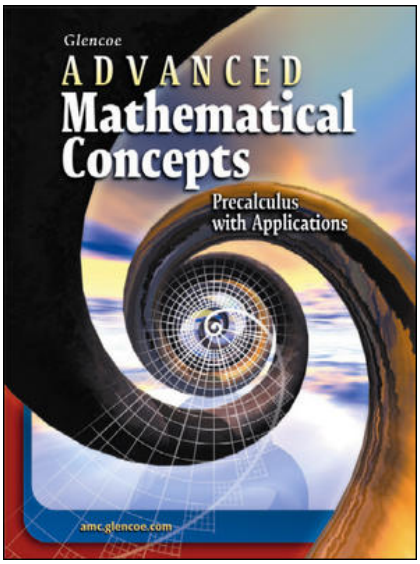
Glencoe

Math Grade 11
Assessment Anchors and Eligible Content

Pennsylvania



ADVANCED Mathematical Concepts

Precalculus
with Applications
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STANDARDS	PAGE REFERENCES
M11.A Numbers and Operations	
ASSESSMENT ANCHOR **M11.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**	
M11.A.1.1 Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, exponents and scientific notation). ***Reference: 2.1.8.A, 2.1.8.B, 2.1.11.A***	
M11.A.1.1.1 Find the square root of an integer to the nearest tenth using either a calculator or estimation.	**Student Edition:** 286 ex 3, 471 ex 1, 557 ex 5, 615, 632 ex 1 **Teacher Wraparound Edition:** ICE 291
M11.A.1.1.2 Express numbers and/or simplify expressions using scientific notation (including numbers less than 1).	**Student Edition:** 273 #6, 282 #62, 695 ex 1, 700 #19, 701 #68, 727 ex 2, 749 #4 **Teacher Wraparound Edition:** ICE 696
M11.A.1.1.3 Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$)	**Student Edition:** 286 ex 3, 471 ex 1, 557 ex 5, 615, 632 ex 1 **Teacher Wraparound Edition:** ICE 291

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

STANDARDS	PAGE REFERENCES
M11.A.1.2 Apply number theory concepts to show relationships between real numbers in problem-solving settings. ***Reference: 2.1.8.E***	
M11.A.1.2.1 Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.	**Student Edition:** 77 #23, 196 #48, 221 #45, 232-233 ex 4, 805 #44, 814 #45, 826 #10, 828 #28, 983 #6
M11.A.1.3 Estimate the value of an irrational number. ***Reference: 2.2.8.C***	
M11.A.1.3.1 Locate/identify irrational numbers at the approximate location on a number line.	**Student Edition:** 206
M11.A.1.3.2 Compare and/or order any real numbers (rational and irrational may be mixed).	This standard can be met in Glencoe's *Algebra 2* © 2005 **Student Edition:** 11, 28, 33, 34, 36 Example 4, 37-38, 43 Example 6 Graphing Calculator Investigation 36
ASSESSMENT ANCHOR **M11.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.**	
M11.A.2.1 Apply ratio and/or proportion in problem-solving situations. ***Reference: 2.2.11.A, 2.8.11.P***	
M11.A.2.1.1 Solve problems using operations with rational numbers including rates and percents (single and multi-step and multiple procedure operations) (e.g., distance, work and mixture problems, etc.).	**Student Edition:** 64 ex 2, 65 #3, 179 #51, 273 #6, 282 #62, 606 #46, 695 ex 1, 700 #19, 701 #68, 727 ex 2
M11.A.2.1.2 Solve problems using direct and inverse proportions.	**Student Edition:** 189-196, 200 #56-#58 **Teacher Wraparound Edition:** A 196; ICE 190, 191, 192; TT 191
M11.A.2.1.3 Identify and/or use proportional relationships in problem-solving settings.	**Student Edition:** 189-196, 200 #56-#58, 248 #35, 283 #72, 284-290, 298 #54, 677 #56, 692 ex 1 **Teacher Wraparound Edition:** A 196; EC 196

STANDARDS	PAGE REFERENCES
M11.A.2.2 Use exponents, roots and/or absolute value to solve problems. ***Reference: 2.1.11.A***	
M11.A.2.2.1 Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10).	**Student Edition:** 273 #6, 282 #62, 695-702, 717 #1-#5, 727 ex 2, 750 #11-#20 **Teacher Wraparound Edition:** A 703; AIN 698; EC 702; FTC 699; ICE 696, 697, 698, 699; TT 696, 697
M11.A.2.2.2 Simplify/evaluate expressions involving multiplying with exponents (e.g., $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7=x^{42}$) and powers of products $(2x^2)^3=8x^6$ (positive exponents only).	**Student Edition:** 273 #6, 282 #62, 695-702, 717 #1-#5, 727 ex 2, 750 #11-#20 **Teacher Wraparound Edition:** A 703; AIN 698; EC 702; FTC 699; ICE 696, 697, 698, 699; TT 696, 697
ASSESSMENT ANCHOR **M11.A.3 Compute accurately and fluently and make reasonable estimates.**	
M11.A.3.1 Apply the order of operations in computation and in problem-solving situations. ***Reference: 2.2.8.A***	
M11.A.3.1.1 Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used).	**Student Edition:** 12 #57, 56 #32, 64 ex 2, 65 #6, 72 #45
M11.A.3.2 Use estimation strategies in problem-solving situations. ***Reference: 2.2.11.B, 2.2.11.D***	
M11.A.3.2.1 Use estimation to solve problems.	**Student Edition:** 272 ex 2, 744 #6c, 745 #14c, 747 #21d, 974 #45
M11.B Measurement	
ASSESSMENT ANCHOR **M11.B.1 Apply appropriate techniques, tools and formulas to determine measurements.**	
M11.B.1.1 Use and/or compare measurements of angles. ***Reference: 2.3.11.A, 2.3.11.B***	
M11.B.1.1.1 Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn).	**Student Edition:** 418 ex 1, 419 #10 *History of Mathematics* 319

STANDARDS	PAGE REFERENCES
M11.B.1.2 Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area and/or volume. (May require conversions within the same system.) ***Reference: 2.3.8.A, 2.3.8.D***	
M11.B.1.2.1 Calculate the surface area of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.	**Student Edition:** 187 #44, 549 #8
M11.B.1.2.2 Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet.	**Student Edition:** 168 #46, 178 #35, 192 ex 5, 226 #13, 227 #44, 233 #9, 235 #10, 492 #50, 701 #68, 975 #50
M11.B.1.2.3 Estimate area, perimeter or circumference of an irregular figure.	**Student Edition:** 257 #51, 533 #29, 549 #6, 684 #50, 964 ex 2, 966 #10-#12, 967 #27, 972 ex 3, 973 #7, 983 #4 **Teacher Wraparound Edition:** ICE 964
M11.B.1.2.4 Find the measurement of a missing length given the perimeter, circumference, area or volume.	**Student Edition:** 77 #28, 303 #22, 549 #10, 693 #7
M11.B.1.3 Describe how a change in one dimension of a figure (2 or 3 dimensional) affects other measurements of that figure. ***Reference: 2.3.8.E***	
M11.B.1.3.1 Describe how a change in the linear dimension of a figure affects its perimeter, circumference, area or volume. • How does changing the length of the radius of a circle affect the circumference of the circle? • How does changing the length of the edge of a cube affect the volume of the cube? • How does changing the length of the base of a triangle affect the area of the triangle?	This standard can be met in Glencoe's *Geometry* © 2005 **Student Edition:** 495 #38, 509 #13-#14, 599 #32-#34, 607 #47, 615 #49-#54, 647 #36-#38, 653 #29-#33, 658 #21, 707-710 *Spreadsheet Investigation* 695

STANDARDS	PAGE REFERENCES
M11.C Geometry	
ASSESSMENT ANCHOR **M11.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.**	
M11.C.1.1 Identify and/or use parts of circles and segments associated with circles. ***Reference: 2.9.11.F***	
M11.C.1.1.1 Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole).	**Student Edition:** 95 #31, 283 #78, 343-351, 548 ex 1, 623-630
M11.C.1.1.2 Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles.	**Student Edition:** 105 #62, 300 ex 3, 317 #30, 346 ex 3, 348 #11-#12, 349 #40, 350 #61, 376 #64, 476 #32, 612 ex 2, 623-630, 969 #1 **Teacher Wraparound Edition:** ICE 300, 346
M11.C.1.2 Recognize and/or apply properties of angles, triangles and quadrilaterals. ***Reference: 2.9.8.D, 2.9.11.C***	
M11.C.1.2.1 Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem).	**Student Edition:** 36 #31, 302 #8, 419 #10, 473 ex 3
M11.C.1.2.2 Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles).	**Student Edition:** 331 #25, 412 #49, 560 #65, 620 #21, 621 #31
M11.C.1.2.3 Identify and/or use properties of isosceles and equilateral triangles.	**Student Edition:** 71 #33, 302 #8, 326 #46, 483 #10, 516 ex 4, 619 #3, 620 #9, 621 #30, 833 #56
M11.C.1.3 Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three- dimensional figures. ***Reference: 2.9.11.B***	
M11.C.1.3.1 Identify and/or use properties of congruent and similar polygons or solids.	**Student Edition:** 92 ex 4, 93 #14, 483 #8, 717 #25 *Graphing Calculator Exploration* 284

STANDARDS	PAGE REFERENCES
M11.C.1.4 Solve problems involving right triangles using the Pythagorean Theorem. ***Reference: 2.10.11.B***	
M11.C.1.4.1 Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet).	**Student Edition:** 286 ex 4, 291, 294 ex 4, 306 ex 2, 327, 340 ex 1, 341 #1, 423, 489 ex 6, 616 ex 2, 620 #11, 632 ex 1 **Teacher Wraparound Edition:** ICE 286, 294, 423, 489
ASSESSMENT ANCHOR **M11.C.2 Locate points or describe relationships using the coordinate plane.**	
M11.C.2.1 Solve problems using analytic geometry. ***Reference: 2.9.11.G***	
M11.C.2.1.1 Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane (formula provided on the reference sheet).	**Student Edition:** 273 #8, 471 ex 1, 557 ex 5, 615, 633, 643
M11.C.2.1.2 Relate slope to perpendicularity and/or parallelism (limit to linear algebraic expressions; slope formula provided on the reference sheet).	**Student Edition:** 32-37, 51 #32, 56 #29, 59 #47-#52 **Teacher Wraparound Edition:** A 37; AIN 34; EC 37; ICE 32, 34, 35
M11.D Algebraic Concepts	
ASSESSMENT ANCHOR **M11.D.1 Demonstrate an understanding of patterns, relations and functions.**	
M11.D.1.1 Analyze and/or use patterns or relations. ***Reference: 2.8.11.Q, 2.8.11.A, 2.8.11.O***	
M11.D.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.	**Student Edition:** 759-765, 766-773, 774-783, 793 #6, 806-814 **Teacher Wraparound Edition:** AIN 761, 779; EC 764; F 766; ICE 760, 761, 762, 766, 768, 770, 779
M11.D.1.1.2 Determine if a relation is a function given a set of points or a graph.	**Student Edition:** 6 ex 4, 8 #3, 9 #10-#11, 10 #32-#37, 19 #36, 31 #1 **Teacher Wraparound Edition:** A 12; ICE 6
M11.D.1.1.3 Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table).	**Student Edition:** 5-11, 19 #34, 31 #1, 44 #18, 51 #36 **Teacher Wraparound Edition:** ICE 5, 6

STANDARDS	PAGE REFERENCES
ASSESSMENT ANCHOR **M11.D.2** **Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**	
M11.D.2.1 Write, solve and/or graph linear equations and inequalities using various methods. ***Reference: 2.8.8.F, 2.8.11.D, 2.8.11.H, 2.8.11.J, 2.8.11.N, 2.8.11.L, 2.8.11.K***	
M11.D.2.1.1 Solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).	**Student Edition:** 54 #2, 55 #19, 60 #59-#66, 136 #47, 221 #40, 318 #41 **Teacher Wraparound Edition:** EC 56
M11.D.2.1.2 Identify or graph functions, linear equations or linear inequalities on a coordinate plane.	**Student Edition:** 5-12, 20-25, 31 #30, 32-37, 45-51
M11.D.2.1.3 Write, solve and/or apply a linear equation (including problem situations).	**Student Edition:** 38-44, 86 #64, 96 #42, 118 #28, 125 #6, 235 #33, 258-264, 499 #57, 542 #30 **Teacher Wraparound Edition:** A 44, 264; AIN 40, 260; EC 44; FTC 39
M11.D.2.1.4 Write and/or solve systems of equations using graphing, substitution and/or elimination (limit systems to 2 equations).	**Student Edition:** 67-72, 73-77, 86 #64, 96 #36, 104 #55, 120 #17-#19 **Teacher Wraparound Edition:** A 72, 77; AIN 69, 75; EC 72, 76; ICE 74, 75
M11.D.2.1.5 Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula).	**Student Edition:** 213 ex 1, 219 #9, 220 #29, 268 #16 **Teacher Wraparound Edition:** FTC 214; ICE 214
M11.D.2.2 Simplify expressions involving polynomials. ***Reference: 2.8.11.S***	
M11.D.2.2.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial).	**Student Edition:** 184 ex 4, 202 ex 2, 203 #6
M11.D.2.2.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is not equal to 0).	**Student Edition:** 202 ex 1, 213 ex 1, 219 #9, 220 #29, 268 #16 **Teacher Wraparound Edition:** FTC 214; ICE 214

STANDARDS	PAGE REFERENCES
M11.D.2.2.3 Simplify algebraic fractions.	**Student Edition:** 180-188, 202 ex 1, 203 #1, 243-250 **Teacher Wraparound Edition:** H 181
ASSESSMENT ANCHOR **M11.D.3 Analyze change in various contexts.**	
M11.D.3.1 Describe and/or determine change. ***Reference: 2.8.8.J, 2.11.8.B***	
M11.D.3.1.1 Identify, describe and/or use constant or varying rates of change.	**Student Edition:** 21 ex 2, 23 #11, 24 #35, 44 #16, 51 #33, 56 #30, 977 #9 **Teacher Wraparound Edition:** A 37; AIN 23; ICE 21; MTL 27
M11.D.3.1.2 Determine how a change in one variable relates to a change in a second variable (e.g., y=4/x, if x doubles, what happens to y?).	**Student Edition:** *Graphing Calculator Exploration* 26
M11.D.3.2 Compute and/or use the slope of a line. ***Reference: 2.8.11.J, 2.8.11.L***	
M11.D.3.2.1 Apply the formula for the slope of a line to solve problems (formula given on reference sheet).	**Student Edition:** 21 ex 2, 23 #11, 24 #35, 44 #16, 51 #33, 56 #30, 977 #9 **Teacher Wraparound Edition:** A 37; AIN 23; ICE 21; MTL 27
M11.D.3.2.2 Given the graph of the line, 2 points on the line, or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form.	**Student Edition:** 27-31, 32-37, 44 #15, 51 #32, 56 #29, 59 #39-#52 **Teacher Wraparound Edition:** A 31, 37; EC 37; F 32; ICE 28, 29, 34, 35
M11.D.3.2.3 Compute the slope and/or y-intercept represented by a linear equation or graph.	**Student Edition:** 20 ex 1, 22 ex 4, 23 #5-#8, 44 #16, 56 #30 **Teacher Wraparound Edition:** A 37; AIN 23; EC 30; ICE 21

STANDARDS	PAGE REFERENCES
ASSESSMENT ANCHOR **M11.D.4** **Describe or use models to represent quantitative relationships.**	
M11.D.4.1 Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs or tables. ***Reference: 2.8.11.K, 2.8.11.Q***	
M11.D.4.1.1 Match the graph of a given function to its table or equation.	**Student Edition:** 5-12, 20-25, 59 #31-#38 *Graphing Calculator Exploration* 26 **Teacher Wraparound Edition:** ICE 6, 21, 22
M11.E Data Analysis and Probability	
ASSESSMENT ANCHOR **M11.E.1** **Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.**	
M11.E.1.1 Appropriately display and/or use data in problem-solving settings. ***Reference: 2.6.11.A, 2.6.8.E***	
M11.E.1.1.1 Create and/or use appropriate graphical representations of data, including box-and-whisker plots, stem-and-leaf plots or scatter plots.	**Student Edition:** 889-896, 907 #34, 917 #29, 934 #11-#13 **Teacher Wraparound Edition:** A 896; AIN 891; EC 895; ICE 890, 891, 892; MTL 889
M11.E.1.1.2 Analyze data and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots or scatter plots).	**Student Edition:** 889-896, 914 #1, 925 #20, 934 #11-#13, 937 #2, 939 #1 **Teacher Wraparound Edition:** EC 895, 916; MTL 889
ASSESSMENT ANCHOR **M11.E.2** **Select and/or use appropriate statistical methods to analyze data.**	
M11.E.2.1 Use measures of central tendency to describe a set of data. ***Reference: 2.6.8.A, 2.6.11.A***	
M11.E.2.1.1 Calculate or select the appropriate measure of central tendency (mean, mode or median) of a set of data given or represented on a table, line plot or stem-and-leaf plot.	**Student Edition:** 111 #33, 150 #43, 897-907, 908-917, 925 #23, 934 #14-#18, 935 #19-#22, 937 #41, 939 #9
M11.E.2.1.2 Calculate and/or interpret the range, quartiles and interquartile range of data.	**Student Edition:** 909, 914 #1, 915 #9-#12, 916 #22 **Teacher Wraparound Edition:** ICE 909

STANDARDS	PAGE REFERENCES
M11.E.2.1.3 Describe how outliers affect measures of central tendency.	**Student Edition:** 909, 915 #20, 916 #23
ASSESSMENT ANCHOR **M11.E.3 Understand and/or apply basic concepts of probability or outcomes.**	
M11.E.3.1 Apply probability and/or odds to practical situations. ***Reference: 2.7.11.A, 2.7.11.E***	
M11.E.3.1.1 Find probabilities for independent, dependent or compound events and represent as a fraction, decimal or percent).	**Student Edition:** 837-845, 852-858, 859-867, 868-874, 875-880, 883 #27-#30, 884 #37-#47, 885 #50-#51, 887 #6 **Teacher Wraparound Edition:** A 867; AIN 854; EC 867; ICE 860, 861, 862; TT 838
M11.E.3.1.2 Find, convert and/or compare the probability and/or odds of a simple event.	**Student Edition:** 854 ex 3, 855 #3, 856 #12 **Teacher Wraparound Edition:** A 858; EA 855; ICE 854
M11.E.3.2 Apply counting techniques in problem-solving settings. ***Reference: 2.7.8.A***	
M11.E.3.2.1 Determine the number of permutations and/or combinations or apply the fundamental counting principle (formula provided on the reference sheet).	**Student Edition:** 837-845, 846-851, 857 #44-#45, 867 #57, 882 #14-#26 **Teacher Wraparound Edition:** A 845, 851; AIN 841, 848; EC 845, 850; F 846, 852; FTC 838; ICE 838, 839, 840, 841, 842
ASSESSMENT ANCHOR **M11.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.**	
M11.E.4.1 Make predictions using data displays and probability. ***Reference: 2.7.8.E, 2.6.11.D***	
M11.E.4.1.1 Estimate or calculate to make predictions based on a circle, line, bar graph or given situation.	**Student Edition:** 889-896, 914 #1, 925 #20, 934 #11-#13, 937 #2, 939 #1 **Teacher Wraparound Edition:** EC 895, 916; MTL 889
M11.E.4.1.2 Use probability to predict outcomes.	**Student Edition:** 889-896, 914 #1, 925 #20, 934 #11-#13, 937 #2, 939 #1 **Teacher Wraparound Edition:** EC 895, 916; MTL 889

STANDARDS	PAGE REFERENCES
M11.E.4.2 Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions. ***Reference: 2.6.11.C, 2.6.11.D***	
M11.E.4.2.1 Draw, find and/or write an equation for a line of best fit for a scatter plot.	**Student Edition:** 38-44, 51 #31, 60 #53, 61 #69, 151 #51, 258-263 **Teacher Wraparound Edition:** A 264; AIN 40; EC 44; FTC 39; ICE 39, 40, 259, 260
M11.E.4.2.2 Make predictions using the equations or graphs of best-fit lines of scatter plots.	**Student Edition:** 38-44, 51 #31, 60 #53, 61 #69, 151 #51, 258-263 **Teacher Wraparound Edition:** A 264; AIN 40; EC 44; FTC 39; ICE 39, 40, 259, 260