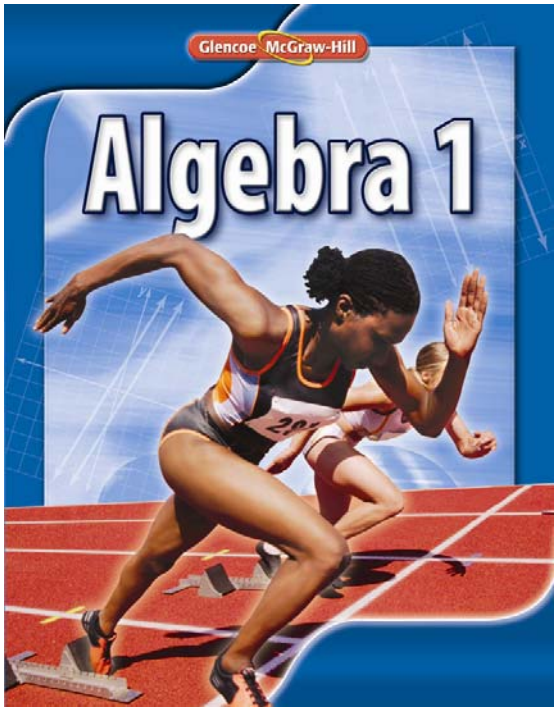
Glencoe

Model Academic Standards for Mathematics Grade 12

Wisconsin



Algebra 1

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STANDARDS	PAGE REFERENCES
Mathematical Processes Performance Standards A Grade 12	
By the end of **grade twelve**, students will:	
A.12.1 Use reason and logic to • evaluate information • perceive patterns • identify relationships • formulate questions, pose problems, and make and test conjectures • pursue ideas that lead to further understanding and deeper insight	**Student Edition:** 54-59, 169, 170-178, 187-193, 194, 195-200, 222-223, 544-549, 578-583 *Algebra Lab* 169, 194 *Graphing Technology Lab* 222-223 *Study Tip* 188, 189, 196, 197, 545, 579 *Watch Out!* 546, 580 **Teacher Edition:** DI 200, 549, 583

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

STANDARDS	PAGE REFERENCES
A.12.2 Communicate logical arguments and clearly show • why a result does or does not make sense • why the reasoning is or is not valid • an understanding of the difference between examples that support a conjecture and a proof of the conjecture	**Student Edition:** 54-59, 80 #55-#57, 89 #87-#90, 166 #59-#60, 194, 307 #36, 309 #57-#60, 739, 746-755, 756-762 *Algebra Lab* 194, 739 *Reading Math* 55 *Study Tip* 55, 56, 758, 759 *Watch Out!* 747 **Teacher Edition:** AE 55-56, 747-749, 757-759; DI 755
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	**Student Edition:** 54-59, 60-61, 187-193, 194, 195-200, 303, 307 #36, 309 #57-#60 *Algebra Lab* 60-61, 194, 303 *Study Tip* 55, 188, 196, 197 **Teacher Edition:** AE 55-56, 188-190, 196-197; DI 59, 193, 200; FMC 56, 189
A.12.4 Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data	**Student Edition:** 48-51, 53, 60-61, 304-309, 310-314, 553-556, 558-563, 757-761 *Algebra Lab* 60-61 *Graphing Technology Lab* 53 *Reading Math* 305 *Study Tip* 48, 306, 311, 758, 759 **Teacher Edition:** AE 48, 305-306, 311-312, 757-759; FCA 61; TNT 305, 306; WCG 60-61
A.12.5 Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly	**Student Edition:** 79 #47-#50, 88 #72-#78, 101 #42-#47, 108 #56-#64, 116 #46-#50, 123 #45-#49, 165 #46-#50, 177 #48-#52, 183 #45-#50, 192 #32-#36, 199 #14-#18, 229 #47-#52, 235 #49-#54, 242 #44-#48, 250 #13-#17, 267 #55-#60, 294 #42-#47, 300 #55-#59, 308 #39-#43, 319 #46-#50, 338 #47-#52
A.12.6 Read and understand • mathematical texts and other instructional materials • writing about mathematics (e.g., articles in journals) and mathematical ideas as they are used in other contexts	**Student Edition:** 4, 62, 74, 75-79, 139, 152, 201, 212, 270, 282, 322, 332, 388, 400, 459, 470, 513, 524, 592, 604, 656, 668, 725, 738, 793 **Teacher Edition:** AE 76-77

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STANDARDS	PAGE REFERENCES
Mathematics, Standard B: Number Operations And Relationships **Performance Standards - Grade 12**	
By the end of **grade twelve**, students will:	
B.12.1 Use complex counting procedures such as union and intersection of sets and arrangements (permutations* and combinations*) to solve problems	**Student Edition:** P33-P36, 60-61, 764-770, 771-778, 779-784, 787-793, 795-796, 797, 798-799, 864-865 *Algebra Lab* 60-61 *Preparing for Standardized Tests* 798-799 *Problem-Solving Tip* 772 *Reading Math* 774 *Study Tip* 765, 766, 773, 780 *Watch Out!* 766, 774 **Teacher Edition:** AE P33-P35, 765-767, 799; WCG 60-61
B.12.2 Compare real numbers using • order relations (>,<) and transitivity* • ordinal scales including logarithmic (e.g., Richter, pH rating) • arithmetic differences • ratios, proportions, percents, rates of change	**Student Edition:** P20-P22, 111-117, 118, 119-124, 125, 142-143, 169, 170-178, 187-193, 283-287, 290-295, 296-301, 304-309, 670-676 *Algebra Lab* 125, 169 *Spreadsheet Lab* 118 *Study Tip* 112, 113, 121, 171, 172, 188, 189 **Teacher Edition:** DI 188; FMC 189
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)	**Student Edition:** P7-P10, P11-P12, P13-P16, P17-P19, 10-15, 16-21, 401-406, 408-414, 416-421, 471-472, 612-617, 618, 620-623, 629 *Graphing Technology Lab* 618 *Study Tip* P8, P9, P10, P12, P14, P15, P18, P19, P21 **Teacher Edition:** AE P7-P9, P11-P12, P13-P16, 613-614; DI 617
B.12.4 In problem-solving situations involving the application of different number systems (natural, integers, rational*, real*) select and use appropriate • computational procedures • properties (e.g., commutativity*, associativity*, inverses*) • modes of representation (e.g., rationals as repeating decimals, indicated roots as fractional exponents)	**Student Edition:** P7-P10, P11-P12, P13-P16, P17-P19, 16-22, 23-29, 416-422, 617, 618, 619-623 *Graphing Technology Lab* 618 *Problem-Solving Tip* 417 *Study Tip* P8, P9, P10, 17, 418 **Teacher Edition:** AE P7-P9, 17-19, 24-26, 417-418; DI 420, 617; FCA 618; FMC 418

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STANDARDS	PAGE REFERENCES
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)	**Student Edition:** 5-9, 10-15, 16-22, 23-29, 31-37, 54-59, 60-61, 80 #55-#57, 89 #87-#90, 166 #59-#60, 309 #57-#60 *Algebra Lab* 60-61 *Reading Math* 55 *Study Tip* 6, 11, 24, 25, 26, 55, 56 *Teaching Tip* 32 **Teacher Edition:** AE 6, 11-12, 17-19, 24-26; DI 29, 37
B.12.6 Routinely assess the acceptable limits of error when • evaluating strategies • testing the reasonableness of results • using technology to carry out computations	**Student Edition:** 68-69, 479-481, 488-490, 495-497, 509-511, 530-534, 539-541, 554-556, 568-571, 630-635, 636-640 *Preparing for Standardized Tests* 68-69 **Teacher Edition:** AE 69, 488, 495, 509, 530, 539, 554, 569, 631, 637; SQ 68
Mathematics, Standard C: Geometry Performance Standards - Grade 12	
By the end of **grade twelve**, students will:	
C.12.1 Identify, describe, and analyze properties of figures, relationships among figures, and relationships among their parts by • constructing physical models • drawing precisely with paper-and-pencil, hand calculators, and computer software • using appropriate transformations* (e.g., translations, rotations, reflections, enlargements) • using reason and logic	**Student Edition:** 60-61, 222-223, 238-243, 541 #38, 544-549, 606-609, 611, 762 #36 *Algebra Lab* 60-61 *Graphing Technology Lab* 222-223, 611 *Review Vocabulary* 546 *Study Tip* 545, 606 *Watch Out!* 546 **Teacher Edition:** AE 239, 545-546, 606-607; DI 243, 549; FCA 223; FMC 546; TNT 547; WCG 60-61
C.12.2 Use geometric models* to solve mathematical and real-world problems	**Student Edition:** 58 #43, 238-243, 630-635, 636, 642-647, 648, 649-655, 659-660, 661, 762 #36, 862-863 *Algebra Lab* 648 *Study Tip* 643 **Teacher Edition:** AE 239, 631, 643-644, 650-651; DI 243; SQ 639, 649; TNT 863; WCG 648

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STANDARDS	PAGE REFERENCES
C.12.3 Present convincing arguments by means of demonstration, informal proof, counter-examples, or any other logical means to show the truth of • statements (e.g., these two triangles are not congruent) • generalizations (e.g., the Pythagorean* theorem holds for all right triangles)	**Student Edition:** 54-59, 66, 67 #24-#25, 70 #2, 80 #55-#57, 89 #87-#90, 166 #59-#60, 194, 237-243, 309 #57-#60, 503, 631-634 *Algebra Lab* 194 *Reading Math* 55 *Study Tip* 55 **Teacher Edition:** AE 55-56, 239, 631; DI 243; FMC 56; TT 194
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	**Student Edition:** 161-166, 167-168, 169, 170-178, 237-243, 244, 333-339, 525-535, 536, 537-542, 662-663 *Algebra Lab* 169, 536 *Graphing Technology Lab* 167-168 *Preparing for Standardized Tests* 662-663 *Reading Math* 239 *Review Vocabulary* 334 *Study Tip* 162, 171, 172, 239, 538 **Teacher Edition:** AE 162-163, 171-174; DI 243; FMC 239
C.12.5 Identify and demonstrate an understanding of the three ratios used in right-triangle trigonometry (sine, cosine, tangent)	**Student Edition:** 648, 649-655, 660, 661 #26-#27, 676 #61-#63, 683 #53-#58, 755 #43-#45, 839, 854 #11 *Study Tip* 650 *Watch Out!* 650 **Teacher Edition:** AE 650-651; DI 655; FMC 651; SQ 649; WCG 648; WO 655
Mathematics Performance Standards D Grade 12	
By the end of **grade twelve,** students will:	
D.12.1 Identify, describe, and use derived attributes* (e.g., density, speed, acceleration, pressure) to represent and solve problem situations	**Student Edition:** 132-137, 144 #79, 145 #24-#25, 479-481, 495-497, 509-511, 530-534, 536, 539-541, 554-556, 568-571, 573-577, 732-733 *Algebra Lab* 536 *Preparing for Standardized Tests* 732-733 *Problem-Solving Tip* 133 *Study Tip* 133, 135 **Teacher Edition:** AE 133-135, 539, 574-575; DI 134; FMC 134

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STANDARDS	PAGE REFERENCES
D.12.2 Select and use tools with appropriate degree of precision to determine measurements directly* within specified degrees of accuracy and error (tolerance)	**Student Edition:** 169, 862-863 *Algebra Lab* 169 **Teacher Edition:** AE 862-863; ETC 169; FCA 169; TNT 863; WCG 169
D.12.3 Determine measurements indirectly*, using • estimation • proportional reasoning, including those involving squaring and cubing (e.g., reasoning that areas of circles are proportional to the squares of their radii) • techniques of algebra, geometry, and right triangle trigonometry • formulas in applications (e.g., for compound interest, distance formula) • geometric formulas to derive lengths, areas, or volumes of shapes and objects (e.g., cones, parallelograms, cylinders, pyramids) • geometric relationships and properties of circles and polygons (e.g., size of central angles, area of a sector of a circle) • conversion constants to relate measures in one system to another (e.g., meters to feet, dollars to Deutschmarks	**Student Edition:** P23-P25, P26-P28, P29-P30, P31-P32, 128-130, 163-165, 195-200, 539-542, 554-556, 559-563, 621, 630-635, 636-641, 642-647, 648, 664 #4, 676, 683, 755 #43-#45, 857-858 *Study Tip* 559, 561 **Teacher Edition:** AE 163, 621, 632; TNT 163
Mathematics, Standard E: Statistics and Probability Performance Standards - Grade 12 By the end of **grade twelve,** students will:	
E.12.1 Work with data in the context of real-world situations by • formulating hypotheses that lead to collection and analysis of one- and two-variable data • designing a data collection plan that considers random sampling, control groups, the role of assumptions, etc. • conducting an investigation based on that plan • using technology to generate displays, summary statistics*, and presentations	**Student Edition:** 245-250, 252, 253-260, 739, 740-745, 746-755, 756-762, 763, 787-792, 794-796 *Algebra Lab* 252, 739 *Reading Math* 789 *Study Tip* 741, 758, 759 *Watch Out!* 747, 761 **Teacher Edition:** AE 741-742, 747-749, 757-759, 788-789

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E.12.2 Organize and display data from statistical investigations using • frequency distributions • percentiles*, quartiles, deciles • line of best fit* (estimated regression line) • matrices	**Student Edition:** P37-P39, P40-P43, P45, 245-251, 252, 253-260, 368, 369-375, 590-591, 746-755 *Graphing Technology Lab* 590-591 *Reading Math* 247 *Spreadsheet Lab* 368, 371 *Study Tip* P38, P39, P42, P43, 246, 255, 370 *Watch Out!* 371 **Teacher Edition:** AE P37-P38, P40-P42, 246-247, 254-257, 370-372, 747-749; DI 749, 752
E.12.3 Interpret and analyze information from organized and displayed data when given • measures of dispersion*, including standard deviation and variance • measures of reliability • measures of correlation*	**Student Edition:** 245-250, 252, 253-258, 590-591, 739, 746-755, 756-762, 763, 779-784, 785-786 *Algebra Lab* 252, 739 *Graphing Technology Lab* 590-591, 785-786 *Study Tip* 246, 758, 759 *Watch Out!* 747 **Teacher Edition:** AE 254-255, 747-749, 757-759; DI 752, 758
E.12.4 Analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, advertising, etc.	**Student Edition:** 252, 253-258, 739, 740-745, 746-755, 756-762, 763, 764-770, 771-778, 779-784, 785-786, 787-792, 794-796 *Algebra Lab* 252, 739 *Graphing Technology Lab* 785-786 *Study Tip* 741, 758, 759 *Watch Out!* 747 **Teacher Edition:** DI 745, 752
E.12.5 Determine the likelihood of occurrence of complex events by • using a variety of strategies (e.g., combinations*) to identify possible outcomes • conducting an experiment • designing and conducting simulations* • applying theoretical probability	**Student Edition:** P33-P36, 756-762, 763, 764-770, 771-778, 779-784, 785-786, 787-792, 795-796, 797 *Graphing Technology Lab* 785-786 *Problem-Solving Tip* 772 *Study Tip* 765, 766, 773, 780 *Watch Out!* 768, 774 **Teacher Edition:** AE 757-759, 765-767, 772-774, 780-781; DI 770

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STANDARDS	PAGE REFERENCES
Mathematics, Standard F: Algebraic Relationships **Performance Standards - Grade 12**	
By the end of **grade twelve,** students will:	
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	**Student Edition:** 180-186, 187-193, 194, 195-200, 203-204, 205, 578-583, 584-589, 590-591, 669, 670-676 *Algebra Lab* 194 *Graphing Technology Lab* 590-591, 669 *Problem-Solving Tip* 182, 672 *Study Tip* 181, 188, 189, 196, 197, 579, 671 *Watch Out!* 580 **Teacher Edition:** AE 181-182, 188-190, 196-197; DI 200
F.12.2 Use mathematical functions* (e.g., linear*, exponential*, quadratic*, power) in a variety of ways, including • recognizing that a variety of mathematical and real-world phenomena can be modeled* by the same type of function • translating different forms of representing them (e.g., tables, graphs, functional notation*, formulas) • describing the relationships among variable quantities in a problem • using appropriate technology to interpret properties of their graphical representations (e.g., intercepts, slopes, rates of change, changes in rates of change, maximum*, minimum*)	**Student Edition:** 153-160, 161-166, 167-168, 169, 170-178, 180-186, 187-193, 195-200, 214-221, 222-223, 245-251, 261-268, 269, 525-534, 536, 537-542, 543, 544-550, 565, 567-571, 573-577, 590-591 *Algebra Lab* 169, 536 *Graphing Technology Lab* 167-168, 222-223, 269, 543, 565, 590-591
F.12.3 Solve linear and quadratic equations, linear inequalities, and systems of linear equations and inequalities • numerically • graphically, including use of appropriate technology • symbolically, including use of the quadratic formula	**Student Edition:** 75-80, 83-89, 90, 91-96, 97-102, 132-138, 161-166, 167-168, 187-193, 283-289, 290-295, 296-301, 315-320, 321, 333-339, 340-341, 342-347, 348-354, 355-360, 362-367, 382-386, 387, 478-481, 488-490, 495, 501, 507-509, 552-557, 558-564 *Algebra Lab* 90, 169 *Graphing Technology Lab* 167-168, 321, 340-341, 387 *Study Tip* 162

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STANDARDS	PAGE REFERENCES
F.12.4 Model and solve a variety of mathematical and real-world problems by using algebraic expressions, equations, and inequalities	**Student Edition:** 75-80, 126-131, 132-138, 144, 180-186, 187-193, 195-200, 214-221, 222-223, 224-230, 245-251, 479-481, 488-490, 495-497, 509-511, 530-533, 536, 554-556 *Algebra Lab* 536 *Graphing Technology Lab* 222-223 *Problem-Solving Tip* 182 *Study Tip* 181 **Teacher Edition:** AE 133-135, 181-182, 188-190, 196-197

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