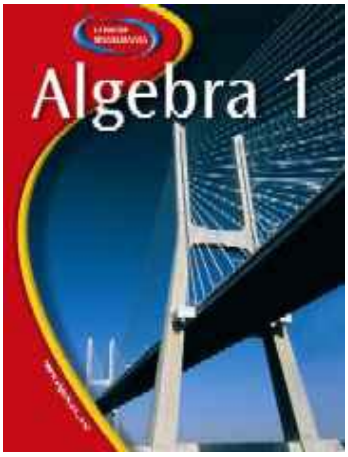
Glencoe

Mathematics
Curriculum Framework

Massachusetts



Algebra 1

STANDARDS		PAGE REFERENCES
Learning Standards for Grades 9–10		
Number Sense and Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems Understand meanings of operations and how they relate to one another Compute fluently and make reasonable estimates		
Students engage in problem solving, communicating, reasoning, connecting, and representing as they:		
10.N.1	Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of n^{th} roots of positive real numbers for any positive integer n; and the inverse relationship between taking the n^{th} root of and the n^{th} power of a positive real number.	**Student Edition:** 21-25, 26-31, 32-35, 68-72, 103-109 **Teacher Wraparound Edition:** H 32; ICE 22, 27-28, 33-34, 104-105
10.N.2	Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., $3(2^4 - 1) = 45$, $4\|3 - 5\| + 6 = 14$; apply such simplifications in the solution of problems.	**Student Edition:** 7-9, 11-15, 16-20, 23-25, 26-31, 32-36, 69-72 **Teacher Wraparound Edition:** ICE 12, 17, 22

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

STANDARDS		PAGE REFERENCES
10.N.3	Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., $\sqrt{3^2-1} \approx 2.8$.	**Student Edition:** 103-109, 126 #56-#59, 196 #56-#59, 511-513, 605-610, 611-615 *Getting Started* 473 #13-#16, 585 #1-#4 **Teacher Wraparound Edition:** ICE 104-106, 612
10.N.4	Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.	**Student Edition:** 72 #66, 75 Example 3, 108, 533-534 Example 1, 535 Example 4, 536 #21-#32, 618 Example 3, 626-627 Example 5, 630 **Teacher Wraparound Edition:** ICE 535, 618
	Patterns, Relations, and Algebra Understand patterns, relations, and functions Represent and analyze mathematical situations and structures using algebraic symbols Use mathematical models to represent and understand quantitative relationships Analyze change in various contexts	
	Students engage in problem solving, communicating, reasoning, connecting, and representing as they:	
10.P.1	Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonnacci Numbers), linear, quadratic, and exponential functional relationships.	**Student Edition:** 233-238, 240-245, 567-571 *Spreadsheet Investigation* 232 *Reading Mathematics* 239 **Teacher Wraparound Edition:** F 240, 567; ICE 234-235, 241-242, 568-570
10.P.2	Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope.	**Student Edition:** 220-223, 256-262, 272-277, 280-285, 286-291, 292-297 *Graphing Calculator Investigation* 224-225, 278-279 **Teacher Wraparound Edition:** ICE 220, 257-258, 273-274, 281-282

STANDARDS		PAGE REFERENCES
10.P.3	Add, subtract, and multiply polynomials. Divide polynomials by monomials.	**Student Edition:** 439-443, 444-449, 452-457, 458-463, 666-671 *Algebra Activity* 437-438, 450-451 **Teacher Wraparound Edition:** ICE 440, 445, 453-454
10.P.4	Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms; factoring (e.g., $a^2 - b^2 = (a + b)(a - b)$, $x^2 + 10x + 21 = (x + 3)(x + 7)$, $5x^4 + 10x^3 - 5x^2 = 5x^2 (x^2 + 2x - 1)$); identifying and canceling common factors in rational expressions; and applying the properties of positive integer exponents.	**Student Edition:** 481-486, 489-494, 495-500, 501-506, 508-514 *Algebra Activity* 480, 487-488 **Teacher Wraparound Edition:** ICE 496-497, 502-503, 509-511
10.P.5	Find solutions to quadratic equations (with real roots) by factoring, completing the square, or using the quadratic formula. Demonstrate an understanding of the equivalence of the methods.	**Student Edition:** 489-494, 495-500, 501-506, 508-514, 539-543, 546-552 **Teacher Wraparound Edition:** ICE 510-511, 540-541, 547-548; TNT 547
10.P.6	Solve equations and inequalities including those involving absolute value of linear expressions (e.g., $\|x - 2\| > 5$) and apply to the solution of problems.	**Student Edition:** 128-134, 135-140, 142-148, 149-154, 318-323, 325-331, 332-337, 345-351 *Algebra Activity* 127, 141, 324 **Teacher Wraparound Edition:** ICE 136-137, 143-144
10.P.7	Solve everyday problems that can be modeled using linear, reciprocal, quadratic, or exponential functions. Apply appropriate tabular, graphical, or symbolic methods to the solution. Include compound interest, and direct and inverse variation problems. Use technology when appropriate.	**Student Edition:** 220 Example 3, 221 #14-#15, 222 #49-#56, 266 Example 5, 267 #12-#14, 292 Example 6, 554, 559 #33-#41, 561-564 **Teacher Wraparound Edition:** ICE 220, 556, 562-563, 643
10.P.8	Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.	**Student Edition:** 369, 373 #44-#54, 376, 385-386 #34-#39, 390 Example 4, 391 #12, #39, #41 *How* 394 **Teacher Wraparound Edition:** F 382; ICE 371, 378, 390, 395

	STANDARDS	PAGE REFERENCES
	Geometry Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships Specify locations and describe spatial relationships using coordinate geometry and other representational systems Apply transformations and use symmetry to analyze mathematical situations Use visualization, spatial reasoning, and geometric modeling to solve problems *Students engage in problem solving, communicating, reasoning, connecting, and representing as they:*	
10.G.1	Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry.	**Student Edition:** 296 #45, 336 #39-#40, 605, 613 #34 *Study Tip* 199 *Prerequisite Skills* 810-811 *Mixed Problem Solving* 860 #13-#15
10.G.2	Draw congruent and similar figures using a compass, straightedge, protractor, and other tools such as computer software. Make conjectures about methods of construction. Justify the conjectures by logical arguments.	**Student Edition:** 200 Example 5b, #7, 201 #21-#22 **Teacher Wraparound Edition:** A 203; ICE 199 #4
10.G.3	Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. Recognize and solve problems associated with radii, chords, and arcs within or on the same circle.	**Student Edition:** 8 #20, 167 Example 3 *Prerequisite Skills* 815-816
10.G.4	Apply congruence and similarity correspondences (e.g., $\Delta ABC \cong \Delta XYZ$) and properties of the figures to find missing parts of geometric figures, and provide logical justification.	**Student Edition:** 199-200 Example 4, 616-620, 630 #70-#71 **Teacher Wraparound Edition:** ICE 199, 617-618
10.G.5	Solve simple triangle problems using the triangle angle sum property and/or the Pythagorean theorem.	**Student Edition:** 605-610, 615 #47-#50, 621 #43-#46, 623-630 *How* 611 *Algebra Activity* 622 **Teacher Wraparound Edition:** A 630; DI 607; ICE 606-607, 624-626
10.G.6	Use the properties of special triangles (e.g., isosceles, equilateral, 30º–60º–90º, 45º–45º–90º) to solve problems.	**Student Edition:** 605-610, 611, 613 #10 *Prerequisite Skills* 810-811

STANDARDS		PAGE REFERENCES
10.G.7	Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points, and apply the results to the solutions of problems.	**Student Edition:** 196 #48-#50, 256-262, 611-615 **Teacher Wraparound Edition:** A 262; DI 612, 613; E 195; ICE 257-258, 612; TT 259
10.G.8	Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the "point-slope" form of the equation.	**Student Edition:** 292-297, 305 #45-#46 *Graphing Calculator Investigation* 278-279 *Study Guide and Review* 311-312 5-6 **Teacher Wraparound Edition:** A 297; DI 294; ICE 293-294
10.G.9	Draw the results, and interpret transformations on figures in the coordinate plane, e.g., translations, reflections, rotations, scale factors, and the results of successive transformations. Apply transformations to the solutions of problems.	**Student Edition:** 197-203, 211 #57-#59, 217 #59-#60 *Study Guide and Review* 247 4-2 *Graphing Calculator Investigation* 545, 556 **Teacher Wraparound Edition:** A 203; DI 198-199; H 197; ICE 198-200
10.G.10	Demonstrate the ability to visualize solid objects and recognize their projections and cross sections.	**Student Edition:** 124 #24, #26, 126 #52, 414 #46-#48, 415 #60, 421 #13 *Getting Started* 409 #19-#20 *Algebra Activity* 416 *Prerequisite Skills* 812, 817
10.G.11	Use vertex-edge graphs to model and solve problems.	**Student Edition:** 198-203, 524-530 *Study Guide and Review* 574-575 **Teacher Wraparound Edition:** A 203; ICE 198-200, 525-526
	Measurement Understand measurable attributes of objects and the units, systems, and processes of measurement Apply appropriate techniques, tools, and formulas to determine measurements	
	Students engage in problem solving, communicating, reasoning, connecting, and representing as they:	
10.M.1	Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles.	**Student Edition:** 412 Example 4, 413 #13-#14, 414 #43-#45, 455 #12, #39-#42, 477 Example 6, #19, 478 #28-#29, 570 #16, 590 #39-#41, 594 Example 3, 595 #12 *Getting Started* 5 #9-#12 **Teacher Wraparound Edition:** ICE 412 #4

STANDARDS		PAGE REFERENCES
10.M.2	Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area.	**Student Edition:** 414 #46-#48, 415 #60, 456 #43-#44 *Getting Started* 409 #18-#20 *Algebra Activity* 416 *Prerequisite Skills* 817
10.M.3	Relate changes in the measurement of one attribute of an object to changes in other attributes, e.g., how changing the radius or height of a cylinder affects its surface area or volume.	**Student Edition:** 477 Example 6, #19, 601 #51-#53 *Algebra Activity* 416
10.M.4	Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.	**Student Edition:** *Algebra Activity* 626
	Data Analysis, Statistics, and Probability Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them Select and use appropriate statistical methods to analyze data Develop and evaluate inferences and predictions that are based on data Understand and apply basic concepts of probability	
	Students engage in problem solving, communicating, reasoning, connecting, and representing as they:	
10.D.1	Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf plots, box-and-whisker plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data.	**Student Edition:** 50-55, 88-94, 298-305, 722-728, 731-736 *Prerequisite Skills* 818-819 **Teacher Wraparound Edition:** ICE 51-52, 89-91, 299-300, 723-724
10.D.2	Approximate a line of best fit (trend line) given a set of data (e.g., scatterplot). Use technology when appropriate.	**Student Edition:** 298-305, 722-728 *Study Guide and Review* 312 5-7 *Graphing Calculator Investigation* 306-307, 729-730 **Teacher Wraparound Edition:** ICE 300-301, 723-724
10.D.3	Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data.	**Student Edition:** 708-713 *Reading Mathematics* 714 **Teacher Wraparound Edition:** DI 710; ICE 709-710; SN 711