

GLENCOE CORRELATION

ALGEBRA 1 © 2003

MASSACHUSETTS

Revised 2000 Mathematics Curriculum Framework
Grades 9-10 Learning Standards

LEARNING STANDARDS	PAGE REFERENCES
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 <i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>	
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 ; the inverse relationship between taking the n^{th} root of and the n^{th} power of a positive real number; and the density of the set of rational numbers in the set of real numbers.	SE: 21-25, 26-31, 32-35, 68-72, 103-109 TWE: F 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.	SE: 7-9, 11-15, 16-20, 23-25, 26-31, 32-36, 69-72 TWE: ICE 12, 17, 22
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., $\sqrt{3^2 - 1} \approx 2.8$.	SE: 103-109, 511-513, 605-610, 611-615 <i>Getting Started</i> 473, 585 <i>Maintain Your Skills</i> 126, 196 TWE: 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.	SE: 533-538, 618-620, 625-630 TWE: ICE 535, 618
Exploratory Concepts and Skills for Grades 9-10	
✓ Analyze relationships among the various subsets of the real numbers (whole numbers, integers, rationals, and irrationals).	SE: 68-72, 103-109 TWE: ICE 104 SN 70
✓ Explore higher powers and roots using technology.	SE: 556-560 TWE: ICE 556
✓ Explore the system of complex numbers and find complex roots of quadratic equations.	SE: 549

LEARNING STANDARDS	PAGE REFERENCES
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 <i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>	
10.P.1 Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonacci Numbers), linear, quadratic, and exponential functional relationships.	SE: 233-238, 240-245, 567-571 <i>Reading Mathematics 239</i> <i>Spreadsheet Investigation 232</i> TWE: 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.	SE: 220-223, 256-262, 272-277, 280-285, 286-291, 292-297 TWE: ICE 220, 257-258, 273-274, 281-282
10.P.3 Add, subtract, and multiply polynomials. Divide polynomials by monomials.	SE: 439-443, 444-449, 452-457, 458-463, 666-671 <i>Algebra Activity 437-438, 450-451</i> TWE: 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.	SE: 481-486, 489-494, 495-500, 501-506, 508-514 <i>Algebra Activity 480, 487-488</i> TWE: 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.	SE: 510-514, 539-543, 546-552 TWE: 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.	SE: 128-134, 135-140, 142-148, 149-154, 318-323, 325-331, 332-337, 345-351 TWE: ICE 136-137, 143-144

LEARNING STANDARDS	PAGE REFERENCES
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.	SE: 218-223, 266-269, 489-500, 554-559, 561-564, 642-646 TWE: 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.	SE: 369-374, 376-381, 382-386, 387-392, 394-398 TWE: F 382 ICE 371, 378, 390, 395
Exploratory Concepts and Skills for Grades 9-10	
√ Explore matrices and their operations. Use matrices to solve systems of linear equations.	SE: 715-721 TWE: F 715 ICE 716-717
√ Investigate recursive function notation.	SE: 234-238
<p>Geometry</p> <p>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</p> <p>Specify locations and describe spatial relationships using coordinate geometry and other representational systems</p> <p>Apply transformations and use symmetry to analyze mathematical situations</p> <p>Use visualization, spatial reasoning, and geometric modeling to solve problems</p> <p><i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i></p>	
10.G.1 Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry.	SE: <i>Prerequisite Skills</i> 810-811
10.G.2 Draw congruent and similar figures using a compass, straightedge, protractor, or computer software. Make conjectures about methods of construction. Justify the conjectures by logical arguments.	See Glencoe's <i>Geometry: Concepts and Applications</i> © 2004. SE: 29-34 <i>Hands-On Geometry</i> 65, 99, 107, 130-131, 162, 210, 474-475 TWE: ICE 30
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.	See Glencoe's <i>Geometry: Concepts and Applications</i> © 2004 Lessons 4-2, 11-1, 11-2, 11-3, 14-1 to meet this objective.
10.G.4 Apply congruence and similarity correspondences (e.g., $\triangle ABC \cong \triangle XYZ$) and properties of the figures to find missing parts of geometric figures, and provide logical justification.	SE: 616-620 TWE: ICE 617-618

LEARNING STANDARDS	PAGE REFERENCES
10.G.5 Solve simple triangle problems using the triangle angle sum property, and/or the Pythagorean Theorem.	SE: 605-610, 611 TWE: ICE 606-607
10.G.6 Use the properties of special triangles (e.g., isosceles, equilateral, 30°-60°-90°, 45°-45°-90°) to solve problems.	See Glencoe's <i>Geometry: Concepts and Applications</i> © 2004. SE: 188-192, 246-250, 251-255, 554-558, 559-563 TWE: 5MC 559 EC 558, 563 ICE 555-556, 560-561
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.	SE: 256-262, 611-615 <i>Extending the Lesson</i> 196 TWE: E 195 ICE 257-258, 612
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.	SE: 292-297 TWE: ICE 293-294 OEA 297
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 solution of problems.	SE: 197-203 <i>Graphing Calculator Investigation</i> 545, 556 TWE: DI 199 ICE 198-200
10.G.10 Demonstrate the ability to visualize solid objects and recognize their projections and cross sections.	SE: <i>Prerequisite Skills</i> 812, 817
10.G.11 Use vertex-edge graphs to model and solve problems.	See Glencoe's <i>Geometry: Concepts and Applications</i> © 2004. SE: 504-509, 516, 522
Exploratory Concepts and Skills for Grades 9-10	
√ Apply properties of chords, tangents, and secants to solve problems.	See Glencoe's <i>Geometry: Concepts and Applications</i> © 2004. SE: 454-458, 468-473, 592-597, 600-605, 606-611, 612-617 TWE: ICE 456, 470-471, 593-594, 601-602
√ Use deduction to establish the validity of geometric conjectures and to prove theorems in Euclidean geometry.	SE: 40-41
Measurement Understand measurable attributes of objects and the units, systems, and processes of measurement Apply appropriate techniques, tools, and formulas to determine measurements <i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>	
10.M.1 Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles.	SE: 412-414, 455, 477-478, 570, 590-591, 594-596, 673 <i>Getting Started</i> 5 <i>Prerequisite Skills</i> 813-814, 815-816

LEARNING 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.	SE: 414-415, 456 <i>Algebra Activity</i> 416 <i>Getting Started</i> 409 <i>Prerequisite Skills</i> 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.	SE: 601 <i>Algebra Activity</i> 416
10.M.4 Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.	SE: <i>Algebra Activity</i> 626
Exploratory Concepts and Skills for Grades 9-10	
√ Explore the scientific use of different systems of measurement, e.g., centimeter-gram-second (CGS), Scientific International (SI).	A conversion chart is located inside the back cover of the textbook.
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 <i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>	
10.D.1 Select, create, and interpret an appropriate graphical representation (e.g., scatterplot, table, stem-and-leaf 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.	SE: 50-55, 88-94, 298-305, 722-728, 731-736 <i>Prerequisite Skills</i> 818-819 TWE: 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.	SE: 298-305 <i>Graphing Calculator Investigation</i> 306-307, 729-730 TWE: ICE 300-301
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.	SE: 708-713 TWE: DI 710 ICE 709-710 SN 711
Exploratory Concepts and Skills for Grades 9-10	
√ Explore designs of surveys, polls, and experiments to assess the validity of their results and to identify potential sources of bias; identify the types of conclusions that can be drawn.	SE: 708-713 TWE: ICE 709-710 OEA 713
√ Describe the differences between the theoretical probability of simple events and the experimental outcome from simulations.	SE: 782-787 TWE: ICE 784

Codes Used for TWE Pages

DI	Differentiated Instruction
E	Enrichment
F	Focus
ICE	In-Class Examples
OEA	Open-Ended Assessment
SN	Study Notebook
TNT	Tips for New Teachers