

**GLENCOE CORRELATION**  
**ALGEBRA: CONCEPTS AND APPLICATIONS © 2004**  
**MASSACHUSETTS**  
 Revised 2000 Mathematics Curriculum Framework  
 Grades 9-10 Learning Standards

LEARNING STANDARDS	PAGE REFERENCES
<b>Number Sense and Operations</b> 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 $n^{\text{th}}$ roots of positive real numbers for any positive integer $n$ ; the inverse relationship between taking the $n^{\text{th}}$ root of and the $n^{\text{th}}$ power of a positive real number; and the density of the set of rational numbers in the set of real numbers.	SE: 8-13, 14-18, 19-23, 64-69, 70-74, 75-79, 82-85, 94-99, 100-103, 357-361
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: 8-13, 14-18, 19-23, 64-69, 70-74, 75-79, 82-85, 94-99, 100-103, 140-145
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: 357-361, 362-365, 366-371, 478-482, 483-487, 580-585, 600-605, 606-611 TWE: OEA 365 ENRICHMENT: 53
10.N.4 Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.	SE: 24-25 ex 1, 161 ex 4, 191 ex 6, 253 ex 8, 292 ex 4, 368-369 ex 4, 480 ex 3, 521-522 ex 5, 532 ex 3, 573-574 ex 3
<b>Exploratory Concepts and Skills for Grades 9-10</b>	
√ Analyze relationships among the various subsets of the real numbers (whole numbers, integers, rationals, and irrationals).	SE: 16, 52-57, 94-99, 362-365, 600-605, 619 #44-#46, 673 #44-#46 TWE: MTL 362 T 53, 601
√ Explore higher powers and roots using technology.	SE: 336-340, 354 ex 7, 359 ex 6, 362 <i>Graphing Calculator Exploration</i> 338-339, 471
√ Explore the system of complex numbers and find complex roots of quadratic equations.	See Glencoe's <i>Algebra 2</i> © 2003 Lessons 5-9, 6-4, and 6-5 to meet this objective.

LEARNING STANDARDS	PAGE REFERENCES
<b>Patterns, Relations, and Algebra</b> 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: 69 #73, 170 #93, 284-289, 316-321, 341-345, 347, 352, 464-467 <i>Graphing Calculator Exploration 338-339</i> <i>Investigation 494-495</i>
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: 284-289, 290-295, 296-301, 310-315, 316-321, 322-327, 340 #46-#48, 365 #47-#49 <i>Graphing Calculator Exploration 317</i> <i>Investigation 308-309</i>
10.P.3 Add, subtract, and multiply polynomials. Divide polynomials by monomials.	SE: 388-393, 394-398, 399-404, 405-409, 650-655 <i>Hands-On Algebra 388-389, 400, 650</i>
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: 388-393, 428-433, 434-439, 440-444, 445-449, 650-655 <i>Hands-On Algebra 388-389, 428, 434-435, 440</i>
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: 468-473, 474-477, 478-482, 483-487, 493 #27-#29, 518 #42 <i>Graphing Calculator Exploration 471</i> <i>Hands-On Algebra 478-479</i> TWE: OEA 487 RA 475
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: 112-116, 117-121, 122-127, 128-131, 160-164, 165-170, 171-175, 176-179, 519-523, 530-534

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: 253 ex 8, 255 #40, 264-269, 270-275, 472 #24-#26, 474-477, 489-493 <i>Investigation</i> 262-263, 308-309 ENRICHMENT: 44
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: 550-553, 554-559, 560-565, 566-571, 572-577, 585 #26, 586-590 <i>Graphing Calculator Investigation</i> 551, 588 <i>Math in the Workplace</i> 591
<b>Exploratory Concepts and Skills for Grades 9-10</b>	
√ Explore matrices and their operations. Use matrices to solve systems of linear equations.	SE: <i>Investigation</i> 80-81, 578-579
√ Investigate recursive function notation.	SE: <i>Investigation</i> 110-111
<b>Geometry</b> 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 <i>Students engage in problem solving, communicating, reasoning, connecting, and representing as they:</i>	
10.G.1 Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry.	SE: 386 #15, 610 #29, #32
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: <i>Hands-On Algebra</i> 194 <i>Preparation for Standardized Tests</i> 546-547

LEARNING STANDARDS	PAGE REFERENCES
10.G.5 Solve simple triangle problems using the triangle angle sum property, and/or the Pythagorean Theorem.	SE: 366-371, 605 #58, 606-607, 609 #2, 619 #40, 623 #37 <i>Investigation</i> 372-373 <i>Preparation for Standardized Tests</i> 546-547 ENRICHMENT: 54, 88
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: 284-289, 290-295, 296-301, 606-611, 619 #43, 623 #40-#41, 643 #73 <i>Hands-On Algebra</i> 606 <i>Investigation</i> 612-613 TWE: OEA 289
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: 322-327, 340 #45, 345 #54 TWE: OEA 327
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: 69 #61, 77 ex 9, 78 #13, 79 #49, 88 #62 <i>Hands-On Algebra</i> 324 ENRICHMENT: 47
10.G.10 Demonstrate the ability to visualize solid objects and recognize their projections and cross sections.	SE: 477 #33 <i>Hands-On Algebra</i> 25 ENRICHMENT: 55, 57
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
<b>Exploratory Concepts and Skills for Grades 9-10</b>	
√ 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: <i>Investigation</i> 30-31

LEARNING STANDARDS	PAGE REFERENCES
<b>Measurement</b> 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: 23 #41, 27 #6, 29 #16, 115 #38 <i>Investigation</i> 410-411, 426-427 TWE: EC 433 ENRICHMENT: 33, 57, 64
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: 340 #42 <i>Hands-On Algebra</i> 25 ENRICHMENT: 55, 57
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: <i>Investigation</i> 410-411
10.M.4 Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements.	SE: 24-25 ex 1
<b>Exploratory Concepts and Skills for Grades 9-10</b>	
√ 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.
<b>Data Analysis, Statistics, and Probability</b> 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: 32-37, 38-43, 238-243, 302-307 <i>Graphing Calculator Exploration</i> 491 <i>Investigation</i> 210-211, 308-309 TWE: FTC 109 ENRICHMENT: 44
10.D.2 Approximate a line of best fit (trend line) given a set of data (e.g., scatterplot). Use technology when appropriate.	SE: 302-307 <i>Graphing Calculator Exploration</i> 491 <i>Investigation</i> 308-309 <i>Problem-Solving Workshop</i> 283 ENRICHMENT: 44
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: 32-37

LEARNING STANDARDS	PAGE REFERENCES
<b>Exploratory Concepts and Skills for Grades 9-10</b>	
√ 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: 32-37, 38-43, 63 #40, 69 #72
√ Describe the differences between the theoretical probability of simple events and the experimental outcome from simulations.	SE: 219-223 <i>Hands-On Algebra</i> 220

### Codes Used for TWE Pages

EC	Extra Credit
FTC	From the Classroom...
MTL	Motivating the Lesson
OEA	Open-Ended Assessment
RA	Reteaching Activity
T	Teach