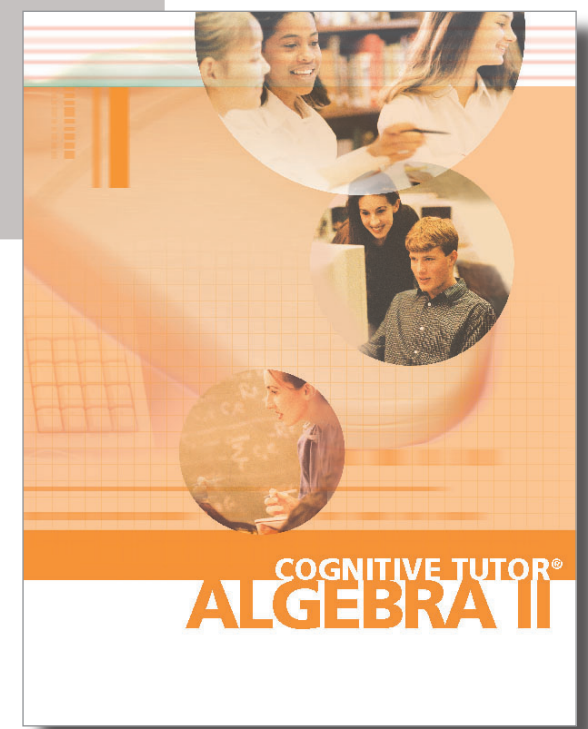


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Classroom Lessons		Skills Covered
Print	Software	
Linear Functions	Units 1 – 9, 29, 32, and 33 <ul style="list-style-type: none"> <li>Graphing Using Slope and Y-Intercept</li> <li>Linear Transformations</li> <li>General Linear Form</li> <li>Solving Systems Algebraically and Graphically</li> <li>Co-Varying Input, Fixed Output</li> <li>Graphing in the Half-Plane</li> <li>Solving Systems of Linear Inequalities</li> <li>Linear Programming</li> </ul>	Students will be able to prepare a mathematical analysis of a problem modeled by a linear function in any form. Solve any linear equation. Understand the concept of inequalities and be able to solve, graph, and interpret linear inequalities. Model and solve systems of two equations or inequalities. Understand what is meant by a solution to a system of equations or inequalities. Use systems of equations or inequalities to solve real-world problems. Connect graphical, tabular, and algebraic representations. Maximize and minimize functions. Understand and use arithmetic sequences and series and inverse functions. Use linear programming to solve real-world problems. Understand functional notation, $f(x)$ , and evaluate $f(x)$ for given values of $x$ . Determine the domain and range of a given function. Describe different kinds of sequences, list next terms or $n$ th terms, and generate a recursive and explicit formula that defines the sequence. Create and use the formula for finding the sum of the first $n$ terms of an arithmetic series. Use matrices to organize data. Perform matrix addition and subtraction. Perform matrix multiplication; and perform scalar multiplication. Use matrices to solve linear systems.
Exponential Functions	Units 10 – 13, and 26 <ul style="list-style-type: none"> <li>Exponential Growth and Decay</li> <li>Equation Solving with Exponents and Logarithms</li> <li>Exponential and Linear Transformations</li> <li>Exponential Systems</li> </ul>	In addition to the skills attained in previous units, students will define and identify exponential functions. Model exponential functions algebraically and graphically, and evaluate and solve exponential equations. Define and identify logarithmic function. Understand the relationship between exponential and logarithmic functions. Define and apply the properties of logarithms in order to solve exponential functions. Compare basic properties of linear and exponential functions. Find the common ratio of a geometric sequence. Find the formula for the $n$ th term of a geometric sequence and use it to write several terms of that sequence. Define a geometric series. Understand and derive the formula for finding the sum of the first $n$ terms of a geometric series. Determine whether an infinite geometric series will converge or diverge. Find the sum of an infinite geometric series.
Quadratics	Units 14 – 20, and 25 <ul style="list-style-type: none"> <li>Linear and Quadratic Transformations</li> <li>Quadratic Models in Factored Form</li> <li>Quadratic Models in General Form</li> <li>Solving by Factoring</li> <li>Generalized Quadratic Solving</li> <li>Linear, Quadratic, and Exponential Transformations</li> <li>Quadratic Systems</li> </ul>	In addition to the skills attained in previous units, students will understand the relationship between the symbolic and graphical representations for quadratic functions. Transform quadratic functions graphically and algebraically using dilations, reflections, vertical shifts, and horizontal shifts. Given the transformation, create the algebraic model of a quadratic function. Understand the equivalence between algebraic representations. Define, model algebraically and graphically, and solve quadratic equations and inequalities. Model real-world phenomena with quadratic functions and transformations of quadratics functions. Define relationships, functions, one-to-one functions, and inverse functions. Compare functional forms and families of functions, especially linear, quadratic, and exponential functions. Represent quadratic functions in vertex form, factored form and standard form. Factor algebraic expressions of the second-degree. Use quadratic formula and factoring techniques for find roots of quadratic functions. Find vertex, intercepts, and line of symmetry for a quadratic function. Model vertical motion of a projectile. Use multiple representations, including numeric, algebraic, and graphic, to represent quadratic functions. Express the square root of a negative number in terms of the imaginary unit. Perform arithmetic operations with imaginary numbers. Evaluate powers of the imaginary unit. Identify real and imaginary parts of a complex number and plot on the complex plane. Use the quadratic formula to find complex roots and zeros. Perform operations with complex numbers.

Classroom Lessons		Skills Covered
Print	Software	
Higher Order Polynomial Functions	Units 21 – 24 <ul style="list-style-type: none"> <li>Cubics</li> <li>Five Functions Transformations</li> <li>Adding and Subtracting Polynomials</li> <li>Rational Expressions</li> </ul>	In addition to the skills attained in previous units, students will define and identify a polynomial function and the family of polynomial functions. Model and graph situations and solve problems involving polynomial functions. Understand the relationship between the degree of the polynomial function and the number of zeros. Find the zeros of polynomial function. Define local maxima and minima, intervals of increase and decrease, and end behavior. Define a rational function, the domain and range, continuity and discontinuity. Identify asymptotes. Operate on rational expressions. Represent the parent function and perform the basic set of transformations. Define the inverse of a rational function and apply procedures for computing it. Define base, exponent, and power. Use the definition of an exponent to expand and simplify monomial expressions. Analyze properties of exponents. Define a zero power. Define a negative exponent. Simplify algebraic expressions using various laws of exponents/powers.
Trigonometric Functions	Units 27 – 31 <ul style="list-style-type: none"> <li>Solving Trigonometric Equations</li> <li>Trigonometric Laws</li> <li>Right Triangle Trigonometry with Radian Measure</li> <li>Solving Equations with Trigonometric Functions and Identities</li> </ul>	In addition to skills attained in previous units, students will use real-world problems to motivate circular functions. Measure angles using radian measure. Convert between amount of turn, degree measure, and radian measure. Create graphs of the trigonometric functions and the inverse trigonometric functions. Understand and use amplitude, period, phase shift, and horizontal shifts in graphing periodic functions. Use real-world problems to understand the relationship between the unit circle and the trigonometric functions. Compute the intercepts, local maxima, and local minima for periodic functions. Use reflections to create graphs for the inverse trigonometric functions. Use real-world problems to understand the sinusoidal graphs. Compute the sine, cosine, or tangent of an angle of any measure. Use the relationship between the values of the sine, cosine, and tangent.
Functions and Relations		In addition to skills attained in previous units, students will graph radical functions. Understand, interpret, and graph, discontinuous functions and relations including step functions and piece-wise defined functions. Create and use polar and parametric equations. Create models of the conic sections, including parabolas, circles, ellipses, and hyperbolas. Make connections to calculus concepts through the use of area models.