Math: Honors Algebra II

UNIT/Weeks (not consecutive)	Timeline/Topics	Essential Questions
2	**Expressions, Equations, and Inequalities** • Patterns and Expressions • Properties of Real Numbers • Algebraic Expressions • Solving Equations • Solving Inequalities • Absolute Value Equations and Inequalities	• How do variables help you model real-life situations? • How can you use the properties of real numbers to simplify algebraic expressions? • How do you solve an equation or inequality?
3	**Functions, Equations, and Graphs** • Relations and Functions • Direct Variation • Linear Functions and Slope-Intercept Form • More about Linear Equations • Using Linear Models • Families of Functions • Absolute Value Functions and Graphs • Two-Variable Inequalities	• What are the similarities and differences in the different forms of a linear equation? • How do you graph an absolute value function using transformations? • How can you model real-life data with a linear function?
3	**Linear Systems** • Solving Systems Using Tables and Graphs • Solving Systems Algebraically • Systems of Inequalities • Linear Programming • Systems with Three Variables • Solving Systems Using Matrices	• How can you find the solution for a system of equations by representing them graphically? • How does writing equivalent equations help you solve a system of equations? • How are the properties of equality used in the matrix solution of a system of equations?
4	**Quadratic Functions and Equations** • Quadratic Functions and Transformations • Standard Form of a Quadratic Function • Modeling with Quadratic Functions • Factoring Quadratic Expressions • Quadratic Equations • Completing the Square • The Quadratic Formula • Complex Numbers	• What are the advantages of a quadratic function in vertex form versus standard form? • What are the similarities and differences of any quadratic function as compared to the parent function $y=x^2$? • How are the real solutions of a quadratic equation related

	• Quadratic Systems	to its graph?
4	**Polynomials and Polynomial Functions** • Polynomial Functions • Polynomials, Linear Factors and Zeros • Solving Polynomial Equations • Dividing Polynomials • The Fundamental Theorem of Algebra • Theorems about Roots of Polynomial Equations • The Binomial Theorem • Polynomial Models in the Real World • Transforming Polynomial Functions	• What information does the degree of a polynomial give you? • What are the relationships between the factors, roots, zeros, and x-intercepts of a polynomial function?
4	**Radical Functions and Rational Exponents** • Roots and Radical Expressions • Multiplying and Dividing Radical Expressions • Binomial Radical Expressions • Rational Exponents • Solving Square Root and Other Radical Equations • Function Operations • Inverse Relations and Functions • Graphing Radical Functions	• How do you simplify the nth root of an expression? • What is necessary to solve any radical equation? • What are the relationships between a function and its inverse?
4	**Exponential and Logarithmic Functions** • Exploring Exponential Models • Properties of Exponential Functions • Logarithmic Functions as Inverses • Properties of Logarithms • Exponential and Logarithmic Equations • Natural Logarithms	• How do you model a quantity that changes regularly over time by the same percentage? • What is the relationship between exponential functions and logarithmic functions? • How can you solve an exponential equation?
3.4	**Rational Functions** • Inverse Variation • The Reciprocal Function Family • Rational Functions and Their Graphs	• What kind of proportionality do two quantities have if an increase in one corresponds to a decrease in another?

	• Rational Expressions • Adding and Subtracting Rational Expressions • Solving Rational Equations	• How do you find the asymptotes of a rational function? • Is the simplified form of a rational function equivalent to the original?
2	**Sequences and Series** • Mathematical Patterns • Arithmetic Sequences • Geometric Sequences • Arithmetic Series • Geometric Series	• How can you represent the terms of a sequence explicitly and recursively? • How can you model a geometric sequence and its sum?
2	**Quadratic Relations and Conic Sections** • Exploring Conic Sections • Parabolas • Circles • Ellipses • Hyperbolas • Translating Conic Sections	• What is the standard form of the graph of a conic? • What is the difference between the algebraic representations of ellipses and hyperbolas?
2.8	**Probability and Statistics** • Nets and Drawings for Visualizing Geometry • Points, Lines and Planes • Segments • Angles • Angle pairs • Basic Constructions • Midpoint and Distance in the Coordinate Plane	• Permutations and Combinations • Probability • Probability of Multiple Events • Conditional Probability • Analyzing Data • Standard Deviation • Samples and Surveys • Binomial Distributions • Normal Distributions
1	**Matrices** • Adding and Subtracting Matrices • Matrix Multiplication • Determinants and Inverses • Inverse Matrices and Systems • Geometric Transformations • Vectors	• How is data organized in a matrix? • How can a matrix equation model a real life situation? • How can a matrix represent a transformation of a geometric figure in the plane?