**PACING GUIDE**

**COURSE:** Honors Algebra 8 **GRADE(S): 8**

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| **MONTH/DAYS** | **UNIT #** | **STANDARDS** | **CONTENT**  Topics being covered? What do students need to know? (*nouns*) | **ACTIVITIES**  w/Integration of Technology & Career Ready Practices | **ASSESSMENTS**  What evidence (formative/summative) is utilized to establish that the content, standards, & skills have been mastered? |
| (35 days) | 1 | MA.9-12.A-CED.A.1  Create equations and inequalities in one variable and use them to solve problems. MA.9-12.A-CED.A.2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. MA.9-12.A-CED.A.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. MA.9-12.A-CED.A.4  Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. MA.9-12.A-REI.A.1  Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. MA.9-12.A-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. MA.9-12.A-REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). MA.9-12.A-SSE.A.1  Interpret expressions that represent a quantity in terms of its context. MA.9-12.A-SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients. MA.9-12.A-SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity. MA.9-12.A-SSE.A.2  Use the structure of an expression to identify ways to rewrite it. For example, see x⁴ – y⁴ as (x²)² – (y²)², thus recognizing it as a difference of squares that can be factored as (x² – y²)(x² + y²). | Create linear equations and inequalities in one variable and use them to solve problems. Justify each step in the process and the solution.  Create linear equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  Interpret terms, factors, coefficients and expressions (including complex linear and exponential expressions) in terms of context.  Model and describe constraints with linear equations and inequalities and systems of equations and/or inequalities to determine if solutions are viable or non-viable.  Solve linear equations and inequalities in one variable (Including literal equations). Justify each step in the process and solution.  Solve multi-step problems that can be represented algebraically with accurate and appropriately defined units, scales, and models (such as graphs, tables, and data displays). | Variables, Grouping Symbols and Equations Translating Words into Symbols and Equations Translating Problems into Equations Using Addition, Subtraction,Multiplication and Division of Real Numbers Problem Solving: Consecutive Integers Transforming Equations: Addition/Subtraction/Multiplication and Division Using Several Tranformations Using Equations to Solve Problems Using Euations with the Variable on both Sides Problem Solving: Using Charts Cost, Income and Value Problems Order of Real Numbers Solving Inequalities Solving Problems Involving Inequalities Solving Combined Inequalities Absolute Value in Open Sentences Absolute Values of Products in Open Sentences | Chapter Test - Chapters 1-3  Mid-Chapter Test - Chapters 1-3  Quizzes - Chapters 1-3 Unit Test  Quiz - Converting word problems into equations |
| (40 days) | 2 | CCSS.Math.Content.HSF-IF.A.2Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.  MA.9-12.A-REI.C.5  Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.  MA.9-12.A-REI.C.6  Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.  MA.9-12.A-REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).  MA.9-12.A-REI.D.11 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.  MA.9-12.A-REI.D.12 Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.  MA.9-12.F-IF.A.1  Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x). MA.9-12.F-IF.A.2  Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.  MA.9-12.F-IF.A.3  Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.  MA.9-12.F-IF.B.5  Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.  MA.9-12.F-IF.C.7  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  MA.9-12.F-IF.C.9  Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). | Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).  Explain and interpret the definition of functions including domain and range and how they are related; correctly use function notation in a context and evaluate functions for inputs and their corresponding outputs.  Find approximate solutions of linear equations by making a table of values, using technology to graph and successive approximations.  Graph equations, inequalities, and systems of inequalities in two variables and explain that the solution to an equation is all points along the curve, the solution to a system of linear functions is the point of intersection, and the solution to a system of inequalities is the intersection of the corresponding half-planes.  Graph functions by hand (in simple cases) and with technology (in complex cases) to describe linear relationships between two quantities and identify, describe, and compare domain and other key features in one or multiple representations.  Solve systems of linear equations in two variables graphically and algebraically. Include solutions that have been found by replacing one equation by the sum of that equation and a multiple of the other.  Write a function for a geometric sequence defined recursively, whose domain is a subset of the integers. | Equations in Two Variables Points, Lines, and Their Graphs Slope of a Line The Slope-Intercept Form of a Linear Equation Determining an Equation of a Line Functions Defined by Tables and Graphs Functions Defined by Equations Linear and Quadratic Functions Graphing Linear Inequalities Systems of Linear Inequalities | Mid-Chapter Test - Chapters 3,8,9  Unit Test - Chapters 3,8,9  Quiz - Graphing Inequalities  Quiz - Slope Intercept Form  Project - Line Design |
| (40 days) | 3 | MA.9-12.A-APR.A.1  Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials  MA.9-12.A-CED.A.1  Create equations and inequalities in one variable and use them to solve problems.  MA.9-12.A-CED.A.2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  MA.9-12.A-CED.A.4  Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.  MA.9-12.A-REI.B.4  Solve quadratic equations in one variable.  MA.9-12.A-REI.C.7  Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.  MA.9-12.A-SSE.A.1  Interpret expressions that represent a quantity in terms of its context.  MA.9-12.A-SSE.A.2  Use the structure of an expression to identify ways to rewrite it. For example, see x⁴ – y⁴ as (x²)² – (y²)², thus recognizing it as a difference of squares that can be factored as (x² – y²)(x² + y²).  MA.9-12.A-SSE.B.3  Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.  MA.9-12.F-BF.A.2  Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. | Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, simple rational and exponential functions and highlighting a quantity of interest in a formula.  Create linear and quadratic equations that represent a relationship between two or more variables. Graph equations on the coordinate axes with labels and scale.  Derive the quadratic formula by completing the square and recognize when there are no real solutions.  Interpret parts of expressions in terms of context including those that represent square and cube roots; use the structure of an expression to identify ways to rewrite it.  Manipulate expressions using factoring, completing the square and properties of exponents to produce equivalent forms that highlight particular properties such as the zeros or the maximum or minimum value of the function.  Perform addition, subtraction and multiplication with polynomials and relate it to arithmetic operations with integers.  Solve quadratic equations in one variable using a variety of methods [including inspection (e.g. x2 = 81), factoring, completing the square, and the quadratic formula].  Write linear and exponential functions (e.g. growth/decay and arithmetic and geometric sequences) from graphs, tables, or a description of the relationship, recursively and with an explicit formula, and describe how quantities increase linearly and exponentially over equal intervals. | Exponents Adding and Subtracting Polynomials Multiplying Monomials Powers of Monomials Multipying Polynomials by Monomials Multiplying Polynomials Tranforming Formulas Rate-Time-Distance Problems Negative Exponents Scientific Notation Dividing Monomials Differences of Two Squares Monomial Factors of Polynomials Differences of Two Squares Squares of Binomials Factoring Patterns Factoring Patterns (for all c) Factoring by Grouping Using Several Methods of Factoring Solving Equations by Factoring Using Factoring to Solve Problems | Mid-Chapter Test  Unit Test  Quiz - Factoring  Quiz - Powers of Monomials and Polynomials  Quiz - Factoring to Solve Word Problems |
| (40 days) | 4 | MA.9-12.A-APR.B.3  Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.  MA.9-12.F-BF.A.1  Write a function that describes a relationship between two quantities.  MA.9-12.F-BF.B.3  Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. MA.9-12.F-IF.B.4For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.  MA.9-12.F-IF.B.5  Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.  MA.9-12.F-IF.B.6  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. MA.9-12.F-IF.C.7  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.  MA.9-12.F-IF.C.8  Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.  MA.9-12.F-IF.C.9  Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).  MA.9-12.F-LE.A.3  Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. | Calculate (over a specified period if presented symbolically or as a table) or estimate (if presented graphically) and interpret the average rate of change of a function.  Compare (using graphs and tables) linear, quadratic, and exponential models to determine that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function, include interpretation of parameters in terms of a context.  Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.  Identify the effects of translations [ f(x) + k, k f(x), f(kx), and f(x + k)] on a function, find the value of k given the graphs.  Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.  Sketch the graph of a function that models a relationship between two quantities (expressed symbolically or from a verbal description) showing key features ( including intercepts, minimums/maximums, domain, and rate of change) by hand in simple cases and using technology in more complicated cases and relate the domain of the function to its graph.  Use properties of integer exponents to explain and convert between expressions involving radicals and rational exponents, using correct notation. For example, we define 51/3 to be the cube root of 5 because we want (51/3) 3 = 5(1/3)3 to hold, so (51/3) 3 must equal 5.  Use the properties of rational and irrational numbers to explain why the sum or product of two rational numbers is rational; the sum of a rational number and an irrational number is irrational; and the product of a nonzero rational number and an irrational number is irrational.  Write a function that describes a linear or quadratic relationship between two quantities given in context using an explicit expression, a recursive process, or steps for calculation and relate these functions to the model.  Write functions in different but equivalent forms by manipulating quadratic expressions using methods such as factoring and completing the square. | Properties of Radicals  Graphing Linear Equations in Slope-Intercept Form  Exponential Functions  Graphing f(x)= a(x - h)2 + k  Using Intercept Form  Solving Quadratic Equations by Graphing  Graphing Square Root Functions  Graphing Cube Root Functions  Comparing Linear, Exponential and Quadratic Functions  Graphing Square Root Functions  Graphing Cube Root Functions  Linear Functions  Function Notation  Graphing Linear Equations is Standard Form  Graphing Linear Equations in Slope-Intercept Form  Exponential Growth and Decay | Mid-Chapter Test - Chps 6,7, 12 Unit Test - Chps 6,7, 12  Quiz - Exponential Growth and Decay  Test- Graphing Various Functions  Project - Stained Glass Window |
| (20 days) | 5 | MA.9-12.F-LE.A.1  Distinguish between situations that can be modeled with linear functions and with exponential functions.  MA.9-12.F-LE.A.2  Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).  0MA.9-12.F-LE.A.3  Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function. | Distinguish between correlation and causation in a data context.  Interpret the slope, intercept and correlation coefficient (compute using technology) of a linear model.  Represent and describe data for two variables on a scatter plot, fit a function to the data, analyze residuals (in order to informally assess fit), and use the function to solve problems. a) Uses a given function or choose a function suggested by the context. Emphasize linear and exponential models.   Represent data on the real number line (i.e. dot plots, histograms, and box plots) and use statistics to compare and interpret differences in shape, center, and spread in the context of the data (account for effects of outliers).  Summarize and interpret categorical data for two categories in two-way frequency tables; recognize associations and trends in the data.   Use the mean and standard deviation of a data set to fit it to a normal distribution, estimate population percentages, and recognize that there are data sets for which such a procedure is not appropriate (use calculators, spreadsheets, and tables to estimate areas under the normal curve).   Write linear and exponential functions (e.g. growth/decay and arithmetic and geometric sequences) from graphs, tables, or a description of the relationship, recursively and with an explicit formula, and describe how quantities increase linearly and exponentially over equal intervals. | Box-and-Whisker Plots  Shapes of Distributions  Choosing a Data Display  Shapes of Distributions  Measures of Center and Variation  Two-Way Tables  Scatter Plots and Lines of Fit  Analyzing Lines of Fit  Scatter Plots and Lines of Fit  Measures of Central Tendency  Central Tendency Applications  Frequency Tables & Histograms  Stem and Leaf Plots  Misleading Graphs | Mid-Chapter Test  Quiz - Analyzing Lines of Best Fit  Quiz - Measure of Central Tendency  Quiz - Various Plots  Unit Test |