

Mathematic Curriculum Map Overview

Topic	Skills	Approximate Weeks of Study
Module 1 Linear Functions and their Algebra	<ul style="list-style-type: none"> • Identify the number of terms and be able to combine like terms to simplify an expression • State whether the equation is an identity or inconsistent • Substitute a value for a variable to simplify an expression • Solve linear equations with one variable • Apply basic exponent rules to simplify an expression • Multiply polynomials using the distributive property • Use the store feature on the calculator to evaluate an expression • Understand the difference between a relation and a function • Determine if a relation is a function given a table, graph, or coordinate pairs • Evaluate a function using function notation • Evaluate a function using composition of functions • Understand the properties of a one-to-one function • Determine if a function is one-to-one • Calculate the inverse of a function • State the key features of a function, including: increasing, decreasing, greater than zero, less than zero, domain, range, relative minimum/maximum, absolute minimum/maximum, y-intercepts, x-intercepts • Find the constant of variation in direct/proportional relationships • Calculate average rate of change for a function over a given interval • Write linear equations in both slope-intercept and point-slope form • Model real-life situations with linear functions • Graph piecewise functions • Solve systems of linear equations in two and three variables using substitution and/or elimination methods 	25 Days

<p>Module 2 Exponentials, Logs, Series & Sequences</p>	<ul style="list-style-type: none"> • Evaluate exponential functions with integer, rational, and negative exponents • Use addition and product properties of exponents to simplify expressions • Rewrite a rational exponent into a root, and vice versa • Graph exponential functions • Write equations of exponential functions given a table, coordinates, or graph • Solve equations by finding a common base • Model real-life scenarios using exponential functions • Calculate percent growth/decay for an exponential function • Understand that the inverse of an exponential function is a logarithmic function • Convert from exponential to logarithmic form, and vice versa • Determine the value of a logarithm • Graph logarithmic functions • Identify key features of exponential and logarithmic functions including: increasing, decreasing, greater than zero, less than zero, domain, range, relative minimum/maximum, absolute minimum/maximum, y-intercepts, x-intercepts • Use laws of logarithms to expand or simplify an expression • Solve exponential equations using logarithms • Understand properties of the number e and natural logarithms • Use exponential functions to solve problems involving compound interest • Apply Newton's Law of Cooling to solve real-life problems • Find a term of a sequence given a formula • Understand and apply the definition of a recursive sequence • Find the common difference in an arithmetic sequence • Identify and understand the differences between arithmetic and geometric sequence • Use summation (sigma) notation to evaluate a sum • Know that a series is a sum of the terms of a sequence • Use and apply the formulas for sum of an arithmetic and geometric series 	<p style="text-align: center;">26 Days</p>
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<p>Module 3 Quadratic Functions, Graphs, and Radicals</p>	<ul style="list-style-type: none"> • Evaluate quadratic functions • Given a quadratic function, complete a table of values and graph the function • Identify the turning point (vertex) and axis of symmetry of a quadratic function • State the key features of a quadratic function, including: increasing, decreasing, greater than zero, less than zero, domain, range, relative minimum/maximum, absolute minimum/maximum, y-intercepts, x-intercepts • Factor quadratic equations using a variety of methods, including: greatest common factor (GCF), difference of perfect squares, trinomials (with coefficients =1, and $\neq 1$), grouping, completing the square • Find the zeroes of a quadratic equation by using the zero product law • Understand that the zeroes of a quadratic function is where the parabola crosses the x-axis • Determine if a given value is a solution to a quadratic inequality • Solve quadratic inequalities and represent the solution on a number line • Convert quadratic equations from standard form to vertex form • Use the vertex form of a quadratic to identify the shifts of the parabola • Model real-life scenarios with quadratic functions • Apply the distance formula to show that a given point lies on a circle • Apply the equation of a circle to calculate the center and radius of a circle • Sketch a circle, using its equation, on a coordinate plane • Understand and apply the definitions of the focus and directrix of a parabola • Sketch a parabola and determine the equation of a parabola given its focus and directrix • Understand the vertical and horizontal shifts of a parabola given the equation • Understand how a function equation is changed to reflect a parabola over the x or y-axis • Determine if a function is even, odd, or neither • Identify the graph of a square root function given an equation • Find the domain and range of a square root function • Graph a square root function 	<p style="text-align: center;">39 Days</p>
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<p>Module 3 Continued</p>	<ul style="list-style-type: none"> • Solve square root equations and check for extraneous roots • Use properties of exponents to simplify expressions • Use the quadratic formula to find roots of a quadratic that is not factorable • Apply the quadratic formula to solve real-life scenarios • Know that an imaginary number is the square root of a negative number • Simplify expressions involving powers of i • Perform operations with complex numbers • Solve quadratic equations with complex solutions • Use the discriminant to determine nature of the roots of a quadratic 	
<p>Module 4 Polynomials & Rational Functions</p>	<ul style="list-style-type: none"> • Evaluate power functions • Complete a table of values and sketch a graph of a power function • Write and graph the equation of a function given the roots and a point on the polynomial function • Determine if a polynomial equation is an identity • Determine for which values a rational function is undefined • Evaluate, simplify, and graph rational functions • Perform operations (multiply, divide, add, subtract) with rational expressions • Simplify complex fractions • Simplify rational expressions using long division • Determine if an expression is a factor of a polynomial by using the remainder theorem • Solve fractional equations and inequalities • Identify properties used when solving radical and rational equations 	<p>14 Lessons</p>

<p>Module 5 The Circular Functions</p>	<ul style="list-style-type: none"> • Identify the quadrant in which the terminal ray of an angle will fall in • Sketch angles in standard position and their reference angles • Convert angle measures from degrees to radians, and vice versa • Calculate an arc length given radius and central angle • Use special right triangles to calculate critical values on the unit circle • Understand that the y-coordinate in the unit circle corresponds to the sine and the x-coordinate corresponds to the cosine • Determine in which quadrants are sine and cosine positive or negative • Manipulate expressions that involve the pythagorean identity • Graph sine and cosine functions • Identify key features of a sine and cosine graph, including: amplitude, period, frequency, domain, range, vertical shift, midline • Create equations and graphs of real-life scenarios using sinusoidal modeling • Understand and apply the tangent function • Identify and evaluate expressions that involve reciprocal trig functions 	<p>16 Days</p>
<p>Module 6 Probability & Statistics</p>	<ul style="list-style-type: none"> • Know and apply probability vocabulary • Calculate the probability of an event occurring • Create a Venn Diagram to determine union, intersection and complement of a set • Understand the difference between union and intersection • Calculate conditional probability • Classify an event as dependent or independent • Add and multiply probabilities and know when to perform each operation • Understand and explain the variability (and the different types of variability) within a set of data • Use a random number table • Calculate measures of central tendency for a set of data • Calculate the standard deviation and what this means for a set of data • Understand and apply the normal distribution model to answer questions about a set of data • Calculate the z-score of a data value • Calculate the sample mean of a set of data • Determine what type of correlation a set of data has • Calculate the regression equation for a set of data 	<p>19 Days</p>
<p>EOY Review</p>	<ul style="list-style-type: none"> • Review of essential content and skills from the year. 	<p>17 Days</p>

Key: Clusters and Standards
Major Content
Supporting Content
Additional Content

