Algebra II | Mathematics Standards of Learning for Virginia Public Schools Correlation to *Eureka Math*®

About *Eureka Math*

Created by Great Minds®, a mission-driven Public Benefit Corporation, *Eureka Math*® helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

Aligned

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

Data

Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

Full Suite of Resources

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Mathematical Process Goals for Students	Aligned Components of *Eureka Math*
Mathematical Problem Solving	Lessons in every module engage students in mathematical processes.
Mathematical Communication	
Mathematical Reasoning	
Mathematical Connections	
Mathematical Representations	

Expressions and Operations

A2.EO.1 The student will perform operations on and simplify rational expressions.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.1.a Add, subtract, multiply, or divide rational algebraic expressions, simplifying the result.	Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions Algebra II M1 Lesson 25: Adding and Subtracting Rational Expressions Precalculus and Advanced Topics M3 Lesson 10: The Structure of Rational Expressions
A2.EO.1.b Justify and determine equivalent rational algebraic expressions with monomial and binomial factors. Algebraic expressions should be limited to linear and quadratic expressions.	Algebra II M1 Lesson 4: Comparing Methods—Long Division, Again? Algebra II M1 Lesson 6: Dividing by $x - a$ and by $x + a$ Algebra II M1 Lesson 18: Overcoming a Second Obstacle in Factoring—What If There Is a Remainder? Algebra II M1 Lesson 22: Equivalent Rational Expressions Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions Algebra II M1 Lesson 25: Adding and Subtracting Rational Expressions
A2.EO.1.c Recognize a complex algebraic fraction and simplify it as a product or quotient of simple algebraic fractions.	Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions
A2.EO.1.d Represent and demonstrate equivalence of rational expressions written in different forms.	Algebra II M1 Lesson 4: Comparing Methods—Long Division, Again? Algebra II M1 Lesson 6: Dividing by $x - a$ and by $x + a$ Algebra II M1 Lesson 18: Overcoming a Second Obstacle in Factoring—What If There Is a Remainder? Algebra II M1 Lesson 22: Equivalent Rational Expressions Algebra II M1 Lesson 23: Comparing Rational Expressions Algebra II M1 Lesson 24: Multiplying and Dividing Rational Expressions Algebra II M1 Lesson 25: Adding and Subtracting Rational Expressions

Expressions and Operations

A2.EO.2 The student will perform operations on and simplify radical expressions.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.2.a Simplify and determine equivalent radical expressions that include numeric and algebraic radicands.	Geometry M2 Lesson 22: Multiplying and Dividing Expressions with Radicals Algebra II M1 Lesson 9: Radicals and Conjugates Algebra II M3 Lesson 4: Properties of Exponents and Radicals
A2.EO.2.b Add, subtract, multiply, and divide radical expressions that include numeric and algebraic radicands, simplifying the result. Simplification may include rationalizing the denominator.	Geometry M2 Lesson 22: Multiplying and Dividing Expressions with Radicals Geometry M2 Lesson 23: Adding and Subtracting Expressions with Radicals Algebra II M1 Lesson 9: Radicals and Conjugates Algebra II M3 Lesson 4: Properties of Exponents and Radicals
A2.EO.2.c Convert between radical expressions and expressions containing rational exponents.	Algebra II M3 Lesson 4: Properties of Exponents and Radicals

Expressions and Operations

A2.EO.3 The student will perform operations on polynomial expressions and factor polynomial expressions in one and two variables.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.3.a Determine sums, differences, and products of polynomials in one and two variables.	Algebra I M1 Lesson 8: Adding and Subtracting Polynomials Algebra I M1 Lesson 9: Multiplying Polynomials Algebra I M4 Lesson 1: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 2: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 3: Advanced Factoring Strategies for Quadratic Expressions Algebra I M4 Lesson 4: Advanced Factoring Strategies for Quadratic Expressions Algebra II M1 Lesson 1: Successive Differences in Polynomials Algebra II M1 Lesson 2: The Multiplication of Polynomials Algebra II M1 Lesson 5: Putting It All Together Algebra II M1 Lesson 10: The Power of Algebra—Finding Pythagorean Triples
A2.EO.3.b Factor polynomials completely in one and two variables with no more than four terms over the set of integers.	Algebra I M4 Lesson 1: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 2: Multiplying and Factoring Polynomial Expressions Algebra I M4 Lesson 3: Advanced Factoring Strategies for Quadratic Expressions Algebra I M4 Lesson 4: Advanced Factoring Strategies for Quadratic Expressions Algebra II M1 Lesson 10: The Power of Algebra—Finding Pythagorean Triples Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 12: Overcoming Obstacles in Factoring Algebra II M1 Lesson 13: Mastering Factoring

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.3.c Determine the quotient of polynomials in one and two variables, using monomial, binomial, and factorable trinomial divisors.	Algebra II M1 Lesson 3: The Division of Polynomials Algebra II M1 Lesson 4: Comparing Methods—Long Division, Again? Algebra II M1 Lesson 5: Putting It All Together Algebra II M1 Lesson 18: Overcoming a Second Obstacle in Factoring—What If There Is a Remainder? Algebra II M1 Lesson 22: Equivalent Rational Expressions
A2.EO.3.d Represent and demonstrate equality of polynomial expressions written in different forms and verify polynomial identities including the difference of squares, sum and difference of cubes, and perfect square trinomials.	Algebra II M1 Lesson 2: The Multiplication of Polynomials Algebra II M1 Lesson 7: Mental Math Algebra II M1 Lesson 8: The Power of Algebra—Finding Primes Algebra II M1 Lesson 10: The Power of Algebra—Finding Pythagorean Triples Algebra II M1 Lesson 12: Overcoming Obstacles in Factoring Algebra II M1 Lesson 13: Mastering Factoring

Expressions and Operations

A2.EO.4 The student will perform operations on complex numbers.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.4.a Explain the meaning of i.	Algebra II M1 Lesson 37: A Surprising Boost from Geometry
A2.EO.4.b Identify equivalent radical expressions containing negative rational numbers and expressions in $a + bi$ form.	Algebra II M1 Lesson 37: A Surprising Boost from Geometry Precalculus and Advanced Topics M1 Lesson 5: An Appearance of Complex Numbers

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EO.4.c Apply properties to add, subtract, and multiply complex numbers.	Algebra II M1 Lesson 37: A Surprising Boost from Geometry Precalculus and Advanced Topics M1 Lesson 4: An Appearance of Complex Numbers Precalculus and Advanced Topics M1 Lesson 5: An Appearance of Complex Numbers

Equations and Inequalities

A2.EI.1 The student will represent, solve, and interpret the solution to absolute value equations and inequalities in one variable.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.1.a Create an absolute value equation in one variable to model a contextual situation.	*Supplemental material is necessary to address this standard.*
A2.EI.1.b Solve an absolute value equation in one variable algebraically and verify the solution graphically.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too
A2.EI.1.c Create an absolute value inequality in one variable to model a contextual situation.	*Supplemental material is necessary to address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.1.d Solve an absolute value inequality in one variable and represent the solution set using set notation, interval notation, and using a number line.	*Supplemental material is necessary to address this standard.*
A2.EI.1.e Verify possible solution(s) to absolute value equations and inequalities in one variable algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too *Supplemental material is necessary to fully address this standard.*

Equations and Inequalities

A2.EI.2 The student will represent, solve, and interpret the solution to quadratic equations in one variable over the set of complex numbers and solve quadratic inequalities in one variable.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.2.a Create a quadratic equation or inequality in one variable to model a contextual situation.	Algebra I M4 Lesson 6: Solving Basic One-Variable Quadratic Equations Algebra I M4 Lesson 7: Creating and Solving Quadratic Equations in One Variable Algebra I M4 Lesson 23: Modeling with Quadratic Functions Algebra I M4 Lesson 24: Modeling with Quadratic Functions Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 9: Modeling a Context from a Verbal Description *Supplemental material is necessary to address creating a quadratic inequality in one variable to model a contextual situation.*
A2.EI.2.b Solve a quadratic equation in one variable over the set of complex numbers algebraically.	Algebra II M1 Lesson 38: Complex Numbers as Solutions to Equations Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Algebra II M1 Lesson 40: Obstacles Resolved—A Surprising Result
A2.EI.2.c Determine the solution to a quadratic inequality in one variable over the set of real numbers algebraically.	*Supplemental material is necessary to address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.2.d Verify possible solution(s) to quadratic equations or inequalities in one variable algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M4 Lesson 14: Deriving the Quadratic Formula Algebra I M4 Lesson 15: Using the Quadratic Formula Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ *Supplemental material is necessary to address verifying possible solution(s) to quadratic inequalities in one variable.*

Equations and Inequalities

A2.EI.3 The student will solve a system of equations in two variables containing a quadratic expression.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.3.a Create a linear-quadratic or quadratic-quadratic system of equations to model a contextual situation.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations Algebra II M1 Lesson 36: Overcoming a Third Obstacle—What If There Are No Real Number Solutions? *Supplemental material is necessary to fully address this standard.*
A2.EI.3.b Determine the number of solutions to a linear-quadratic and quadratic-quadratic system of equations in two variables.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations Algebra II M1 Lesson 36: Overcoming a Third Obstacle to Factoring—What If There Are No Real Number Solutions? *Supplemental material is necessary to fully address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.3.c Solve a linear-quadratic and quadratic-quadratic system of equations algebraically and graphically, including situations in context.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations Algebra II M1 Lesson 36: Overcoming a Third Obstacle to Factoring—What If There Are No Real Number Solutions? *Supplemental material is necessary to fully address this standard.*
A2.EI.3.d Verify possible solution(s) to linear-quadratic or quadratic-quadratic system of equations algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	Algebra I M3 Lesson 16: Graphs Can Solve Equations Too Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations Algebra II M1 Lesson 36: Overcoming a Third Obstacle to Factoring—What If There Are No Real Number Solutions? *Supplemental material is necessary to fully address this standard.*

Equations and Inequalities

A2.EI.4 The student will represent, solve, and interpret the solution to an equation containing rational algebraic expressions.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.4.a Create an equation containing a rational expression to model a contextual situation.	Algebra II M1 Lesson 27: Word Problems Leading to Rational Equations

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.4.b Solve rational equations with real solutions containing factorable algebraic expressions algebraically and graphically. Algebraic expressions should be limited to linear and quadratic expressions.	Algebra II M1 Lesson 26: Solving Rational Equations Algebra II M1 Lesson 27: Word Problems Leading to Rational Equations *Supplemental material is necessary to address solving rational equations with real solutions containing factorable algebraic expressions graphically.*
A2.EI.4.c Verify possible solution(s) to rational equations algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	Algebra II M1 Lesson 26: Solving Rational Equations *Supplemental material is necessary to address verifying possible solution(s) to rational equations graphically and with technology.*
A2.EI.4.d Justify why a possible solution to an equation containing a rational expression might be extraneous.	Algebra II M1 Lesson 26: Solving Rational Equations Algebra II M1 Lesson 27: Word Problems Leading to Rational Equations

Equations and Inequalities

A2.EI.5 The student will represent, solve, and interpret the solution to an equation containing a radical expression.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.5.a Solve an equation containing no more than one radical expression algebraically and graphically.	Algebra II M1 Lesson 28: A Focus on Square Roots Algebra II M1 Lesson 29: Solving Radical Equations
A2.EI.5.b Verify possible solution(s) to radical equations algebraically, graphically, and with technology, to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	Algebra II M1 Lesson 28: A Focus on Square Roots Algebra II M1 Lesson 29: Solving Radical Equations
A2.EI.5.c Justify why a possible solution to an equation with a square root might be extraneous.	Algebra II M1 Lesson 28: A Focus on Square Roots Algebra II M1 Lesson 29: Solving Radical Equations

Equations and Inequalities

A2.EI.6 The student will represent, solve, and interpret the solution to a polynomial equation.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.EI.6.a Determine a factored form of a polynomial equation, of degree three or higher, given its zeros or the x-intercepts of the graph of its related function.	Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 19: The Remainder Theorem
A2.EI.6.b Determine the number and type of solutions (real or imaginary) of a polynomial equation of degree three or higher.	Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Algebra II M1 Lesson 40: Obstacles Resolved—A Surprising Result
A2.EI.6.c Solve a polynomial equation over the set of complex numbers.	Algebra II M1 Lesson 38: Complex Numbers as Solutions to Equations Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Algebra II M1 Lesson 40: Obstacles Resolved—A Surprising Result
A2.EI.6.d Verify possible solution(s) to polynomial equations of degree three or higher algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions in context.	Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 19: The Remainder Theorem Algebra II M1 Lesson 38: Complex Numbers as Solutions to Equations Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Algebra II M1 Lesson 40: Obstacles Resolved—A Surprising Result

Functions

A2.F.1 The student will investigate, analyze, and compare square root, cube root, rational, exponential, and logarithmic function families, algebraically and graphically, using transformations.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.1.a Distinguish between the graphs of parent functions for square root, cube root, rational, exponential, and logarithmic function families.	Algebra I M1 Lesson 3: Graphs of Exponential Functions Algebra I M4 Lesson 18: Graphing Cubic, Square Root, and Cube Root Functions Algebra I M5 Lesson 1: Analyzing a Graph Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 18: Graphs of Exponential Functions and Logarithmic Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Precalculus and Advanced Topics M3 Lesson 15: Transforming Rational Functions
A2.F.1.b Write the equation of a square root, cube root, rational, exponential, and logarithmic function, given a graph, using transformations of the parent function, including $f(x) + k$; $f(kx)$; $f(x + k)$; and $kf(x)$, where k is limited to rational values. Transformations of exponential and logarithmic functions, given a graph, should be limited to a single transformation.	Algebra I M4 Lesson 19: Translating Graphs of Functions Algebra I M4 Lesson 20: Stretching and Shrinking Graphs of Functions *Supplemental material is necessary to fully address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.1.c Graph a square root, cube root, rational, exponential, and logarithmic function, given the equation, using transformations of the parent function including $f(x) + k$; $f(kx)$; $f(x + k)$; and $kf(x)$, where k is limited to rational values. Use technology to verify transformations of the functions.	Algebra I M4 Lesson 18: Graphing Cubic, Square Root, and Cube Root Functions Algebra I M4 Lesson 19: Translating Graphs of Functions Algebra I M4 Lesson 20: Stretching and Shrinking Graphs of Functions Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Precalculus and Advanced Topics M3 Lesson 15: Transforming Rational Functions
A2.F.1.d Determine when two variables are directly proportional, inversely proportional, or neither, given a table of values. Write an equation and create a graph to represent a direct or inverse variation, including situations in context.	*Supplemental material is necessary to address this standard.*
A2.F.1.e Compare and contrast the graphs, tables, and equations of square root, cube root, rational, exponential, and logarithmic functions.	Algebra I M4 Lesson 22: Comparing Quadratic, Square Root, and Cube Root Functions Represented in Different Ways Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 18: Graphs of Exponential Functions and Logarithmic Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Algebra II M3 Lesson 27: Modeling with Exponential Functions Algebra II M3 Lesson 28: Newton's Law of Cooling, Revisited Precalculus and Advanced Topics M3 Lesson 12: End Behavior of Rational Functions Precalculus and Advanced Topics M3 Lesson 14: Graphing Rational Functions

Functions

A2.F.2 The student will investigate and analyze characteristics of square root, cube root, rational, polynomial, exponential, logarithmic, and piecewise-defined functions algebraically and graphically.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.2.a Determine and identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically, including graphs with discontinuities.	Algebra I M4 Lesson 18: Graphing Cubic, Square Root, and Cube Root Functions Algebra I M4 Lesson 22: Comparing Quadratic, Square Root, and Cube Root Functions Represented in Different Ways Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 17: Modeling with Polynomials—An Introduction Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Precalculus and Advanced Topics M3 Lesson 1: Solutions to Polynomial Equations Precalculus and Advanced Topics M3 Lesson 12: End Behavior of Rational Functions Precalculus and Advanced Topics M3 Lesson 13: Horizontal and Vertical Asymptotes of Graphs of Rational Functions Precalculus and Advanced Topics M3 Lesson 14: Graphing Rational Functions
A2.F.2.b Compare and contrast the characteristics of square root, cube root, rational, polynomial, exponential, logarithmic, and piecewise-defined functions.	Algebra I M1 Lesson 1: Graphs of Piecewise Linear Functions Algebra I M3 Lesson 15: Piecewise Functions Algebra I M4 Lesson 18: Graphing Cubic, Square Root, and Cube Root Functions Algebra I M4 Lesson 22: Comparing Quadratic, Square Root, and Cube Root Functions Represented in Different Ways Algebra II M1 Lesson 11: The Special Role of Zero in Factoring

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.2.b *continued*	Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 15: Structures of Graphs of Polynomial Functions Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 17: Modeling with Polynomials—An Introduction Algebra II M3 Lesson 8: The "WhatPower" Function Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 18: Graphs of Exponential Functions and Logarithmic Functions Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Precalculus and Advanced Topics M3 Lesson 1: Solutions to Polynomial Equations Precalculus and Advanced Topics M3 Lesson 12: End Behavior of Rational Functions Precalculus and Advanced Topics M3 Lesson 13: Horizontal and Vertical Asymptotes of Graphs of Rational Functions Precalculus and Advanced Topics M3 Lesson 14: Graphing Rational Functions
A2.F.2.c Determine the intervals on which the graph of a function is increasing, decreasing, or constant.	Algebra I M3 Lesson 12: The Graph of the Equation $y = f(x)$ Algebra I M3 Lesson 13: Interpreting the Graph of a Function Algebra I M4 Lesson 8: Exploring the Symmetry in Graphs of Quadratic Functions Algebra I M4 Lesson 10: Interpreting Quadratic Functions from Graphs and Tables Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.2.d Determine the location and value of absolute (global) maxima and absolute (global) minima of a function.	Algebra I M4 Lesson 8: Exploring the Symmetry in Graphs of Quadratic Functions *Supplemental material is necessary to fully address this standard.*
A2.F.2.e Determine the location and value of relative (local) maxima or relative (local) minima of a function.	Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 17: Modeling with Polynomials—An Introduction Algebra II M3 Lesson 22: Choosing a Model
A2.F.2.f For any value, x, in the domain of f, determine $f(x)$ using a graph or equation. Explain the meaning of x and $f(x)$ in context, where applicable.	Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 17: Modeling with Polynomials—An Introduction Algebra II M3 Lesson 6: Euler's Number, e Algebra II M3 Lesson 7: Bacteria and Exponential Growth Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Algebra II M3 Lesson 22: Choosing a Model Algebra II M3 Lesson 24: Solving Exponential Equations Algebra II M3 Lesson 25: Geometric Sequences and Exponential Growth and Decay Algebra II M3 Lesson 26: Percent Rate of Change Algebra II M3 Lesson 27: Modeling with Exponential Functions Algebra II M3 Lesson 28: Newton's Law of Cooling, Revisited Precalculus and Advanced Topics M3 Lesson 21: Logarithmic and Exponential Problem Solving

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.F.2.g Describe the end behavior of a function.	Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions Algebra II M3 Lesson 17: Graphing the Logarithm Function Algebra II M3 Lesson 22: Choosing a Model Precalculus and Advanced Topics M3 Lesson 12: End Behavior of Rational Functions Precalculus and Advanced Topics M3 Lesson 13: Horizontal and Vertical Asymptotes of Graphs of Rational Functions Precalculus and Advanced Topics M3 Lesson 14: Graphing Rational Functions
A2.F.2.h Determine the equations of any vertical and horizontal asymptotes of a function using a graph or equation (rational, exponential, and logarithmic).	Algebra II M3 Lesson 20: Transformations of the Graphs of Logarithmic and Exponential Functions Algebra II M3 Lesson 21: The Graph of the Natural Logarithm Function Precalculus and Advanced Topics M3 Lesson 13: Horizontal and Vertical Asymptotes of Graphs of Rational Functions Precalculus and Advanced Topics M3 Lesson 14: Graphing Rational Functions
A2.F.2.i Determine the inverse of a function algebraically and graphically, given the equation of a linear or quadratic function (linear, quadratic, and square root). Justify and explain why two functions are inverses of each other.	Precalculus and Advanced Topics M3 Lesson 18: Inverse Functions Precalculus and Advanced Topics M3 Lesson 19: Restricting the Domain
A2.F.2.j Graph the inverse of a function as a reflection over the line $y = x$.	Algebra II M3 Lesson 19: The Inverse Relationship Between Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 18: Inverse Functions Precalculus and Advanced Topics M3 Lesson 19: Restricting the Domain
A2.F.2.k Determine the composition of two functions algebraically and graphically.	Precalculus and Advanced Topics M3 Lesson 16: Function Composition Precalculus and Advanced Topics M3 Lesson 17: Solving Problems by Function Composition

Statistics

A2.ST.1 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on univariate quantitative data represented by a smooth curve, including a normal curve.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.1.a Formulate investigative questions that require the collection or acquisition of a large set of univariate quantitative data or summary statistics of a large set of univariate quantitative data and investigate questions using a data cycle.	Algebra II M4 Lesson 13: Using Sample Data to Estimate a Population Characteristic Algebra II M4 Lesson 28: Drawing a Conclusion from an Experiment *Supplemental material is necessary to fully address this standard.*
A2.ST.1.b Collect or acquire univariate data through research, or using surveys, observations, scientific experiments, polls, or questionnaires.	*Supplemental material is necessary to address this standard.*
A2.ST.1.c Examine the shape of a data set (skewed versus symmetric) that can be represented by a histogram, and sketch a smooth curve to model the distribution.	Algebra II M4 Lesson 8: Distributions—Center, Shape, and Spread Algebra II M4 Lesson 9: Using a Curve to Model a Data Distribution
A2.ST.1.d Identify the properties of a normal distribution.	Algebra II M4 Lesson 9: Using a Curve to Model a Data Distribution Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 11: Normal Distributions

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.1.e Describe and interpret a data distribution represented by a smooth curve by analyzing measures of center, measures of spread, and shape of the curve.	Algebra II M4 Lesson 9: Using a Curve to Model a Data Distribution Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 11: Normal Distributions
A2.ST.1.f Calculate and interpret the z-score for a value in a data set.	Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 11: Normal Distributions
A2.ST.1.g Compare two data points from two different distributions using z-scores.	Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 11: Normal Distributions
A2.ST.1.h Determine the solution to problems involving the relationship of the mean, standard deviation, and z-score of a data set represented by a smooth or normal curve.	Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 11: Normal Distributions
A2.ST.1.i Apply the Empirical Rule to answer investigative questions.	Algebra II M4 Lesson 9: Using a Curve to Model a Data Distribution Algebra II M4 Lesson 10: Normal Distributions Algebra II M4 Lesson 17: Margin of Error When Estimating a Population Proportion Precalculus and Advanced Topics M5 Lesson 11: Estimating Probability Distributions Empirically Precalculus and Advanced Topics M5 Lesson 12: Estimating Probability Distributions Empirically

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.1.j Compare multiple data distributions using measures of center, measures of spread, and shape of the distributions.	Algebra II M4 Lesson 8: Distributions—Center, Shape, and Spread Algebra II M4 Lesson 18: Sampling Variability in the Sample Mean

Statistics

A2.ST.2 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on representing bivariate data in scatterplots and determining the curve of best fit using linear, quadratic, exponential, or a combination of these functions.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.2.a Formulate investigative questions that require the collection or acquisition of bivariate data and investigate questions using a data cycle.	*Supplemental material is necessary to address this standard.*
A2.ST.2.b Collect or acquire bivariate data through research, or using surveys, observations, scientific experiments, polls, or questionnaires.	*Supplemental material is necessary to address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.2.c Represent bivariate data with a scatterplot using technology.	Algebra I M2 Topic D: Numerical Data on Two Variables Algebra I M5 Lesson 7: Modeling a Context from Data Algebra II M1 Lesson 20: Modeling Riverbeds with Polynomials Algebra II M1 Lesson 21: Modeling Riverbeds with Polynomials
A2.ST.2.d Determine whether the relationship between two quantitative variables is best approximated by a linear, quadratic, exponential, or a combination of these functions.	Algebra I M2 Lesson 12: Relationships Between Two Numerical Variables Algebra I M2 Lesson 13: Relationships Between Two Numerical Variables Algebra I M2 Lesson 19: Interpreting Correlation Algebra I M5 Lesson 7: Modeling a Context from Data Algebra II M1 Lesson 20: Modeling Riverbeds with Polynomials Algebra II M1 Lesson 21: Modeling Riverbeds with Polynomials
A2.ST.2.e Determine the equation(s) of the function(s) that best models the relationship between two variables using technology. Curves of best fit may include a combination of linear, quadratic, or exponential (piecewise-defined) functions.	Algebra I M2 Lesson 12: Relationships Between Two Numerical Variables Algebra I M2 Lesson 13: Relationships Between Two Numerical Variables Algebra I M2 Lesson 19: Interpreting Correlation Algebra I M5 Lesson 7: Modeling a Context from Data Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 17: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 20: Modeling Riverbeds with Polynomials Algebra II M1 Lesson 21: Modeling Riverbeds with Polynomials Algebra II M3 Lesson 22: Choosing a Model

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.2.f Use the correlation coefficient to designate the goodness of fit of a linear function using technology.	Algebra I M2 Lesson 19: Interpreting Correlation Algebra I M2 Lesson 20: Analyzing Data Collected on Two Variables Algebra I M5 Lesson 7: Modeling a Context from Data
A2.ST.2.g Make predictions, decisions, and critical judgments using data, scatterplots, or the equation(s) of the mathematical model.	Algebra II M3 Lesson 1: Integer Exponents Algebra II M3 Lesson 23: Bean Counting Algebra II M3 Lesson 24: Solving Exponential Equations Algebra II M3 Lesson 27: Modeling with Exponential Functions Algebra II M4 Lesson 2: Calculating Probabilities of Events Using Two-Way Tables Algebra II M4 Lesson 14: Sampling Variability in the Sample Proportion
A2.ST.2.h Evaluate the reasonableness of a mathematical model of a contextual situation.	Algebra II M1 Lesson 16: Modeling with Polynomials—An Introduction Algebra II M1 Lesson 27: Word Problems Leading to Rational Equations Algebra II M3 Lesson 1: Integer Exponents Algebra II M3 Lesson 6: Euler's Number, e Algebra II M3 Lesson 22: Choosing a Model Algebra II M3 Lesson 24: Solving Exponential Equations Algebra II M3 Lesson 27: Modeling with Exponential Functions

Statistics

A2.ST.3 The student will compute and distinguish between permutations and combinations.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math*
A2.ST.3.a Compare and contrast permutations and combinations to count the number of ways that events can occur.	Precalculus and Advanced Topics M5 Lesson 2: Counting Rules—The Fundamental Counting Principle and Permutations Precalculus and Advanced Topics M5 Lesson 3: Counting Rules—Combinations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities
A2.ST.3.b Calculate the number of permutations of n objects taken r at a time.	Precalculus and Advanced Topics M5 Lesson 2: Counting Rules—The Fundamental Counting Principle and Permutations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities
A2.ST.3.c Calculate the number of combinations of n objects taken r at a time.	Precalculus and Advanced Topics M5 Lesson 3: Counting Rules—Combinations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities
A2.ST.3.d Use permutations and combinations as counting techniques to solve contextual problems.	Precalculus and Advanced Topics M5 Lesson 2: Counting Rules—The Fundamental Counting Principle and Permutations Precalculus and Advanced Topics M5 Lesson 3: Counting Rules—Combinations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities
A2.ST.3.e Calculate and verify permutations and combinations using technology.	Precalculus and Advanced Topics M5 Lesson 2: Counting Rules—The Fundamental Counting Principle and Permutations Precalculus and Advanced Topics M5 Lesson 3: Counting Rules—Combinations Precalculus and Advanced Topics M5 Lesson 4: Using Permutations and Combinations to Compute Probabilities