
Algebra I | Kentucky Mathematics Course Standards (2019) Correlation to *Eureka Math*²® (2027)

*Eureka Math*² is a research-proven math curriculum that empowers teachers to center instructional techniques on student success. Teachers can foster more “aha!” learning moments by providing the support needed for all learners to build a more confident math mindset.

This *Eureka Math*² edition builds on a strong foundation of effective instruction. It provides teachers with guidance on delivering rigorous instruction that honors student choice and encourages confident problem-solving.

*Eureka Math*² carefully sequences mathematical content to maximize vertical alignment from kindergarten through high school. This kind of sequencing has proven to be essential in students’ mastery of math.

Teachability

*Eureka Math*² employs streamlined materials that allow teachers to plan more efficiently and focus their energy on delivering high-quality instruction that meets the individual needs of their students. Differentiation suggestions, slide decks, digital interactives, and multiple forms of assessment are just a few of the resources built into the teacher materials.

Accessibility

*Eureka Math*² incorporates Universal Design for Learning (UDL) principles so all learners can access the mathematics and take on challenging math concepts. UDL, Differentiation, and Multilingual Learner supports are built into the instructional design and are clearly identified in the *Teach* book.

The curriculum also carries a focus on readability. By eliminating unnecessary words and using clear sentences, the *Eureka Math*² teacher-writers have created one of the most readable mathematics curricula on the market. The curriculum’s readability and accessibility help all students see themselves as mathematical thinkers and doers who are fully capable of owning their mathematics learning.

Math Confidence

*Eureka Math*² fosters a classroom culture of learning by encouraging student-led discourse and cognitive engagement that results in confident learners. By leveraging consistent models, routines, and progressions, teachers can remove barriers and allow all students an avenue to success. Within the digital platform, each grade includes wordless videos and digital interactives that spark students’ curiosity and help them make conceptual connections. Using the *Learn* books, students wonder, explore, and make sense of mathematics, which helps them develop a strong, positive mathematical identity.

Standards for Mathematical Practice	Aligned Components of <i>Eureka Math</i> ²
<p>MP.1 Make sense of problems and persevere in solving them.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.2 Reason abstractly and quantitatively.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.3 Construct viable arguments and critique the reasoning of others.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.4 Model with mathematics.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.5 Use appropriate tools strategically.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.6 Attend to precision.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.7 Look for and make use of structure.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>
<p>MP.8 Look for and express regularity in repeated reasoning.</p>	<p>Lessons in every module engage students in mathematical practices. These are indicated in margin notes included with every lesson.</p>

The Real Number System

Extend the properties of exponents to rational exponents.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.N.1</p> <p>Extend the properties of integer exponents to rational exponents, allowing for the expression of radicals in terms of rational exponents.</p>	<p>A1 M5 Lesson 9: Unit Fraction Exponents</p> <p>A1 M5 Lesson 10: Rational Exponents</p>
<p>KY.HS.N.2</p> <p>Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	<p>A1 M5 Lesson 9: Unit Fraction Exponents</p> <p>A1 M5 Lesson 10: Rational Exponents</p>

The Real Number System

Use properties of rational and irrational numbers.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.N.3</p> <p>Justify why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</p>	<p>A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations</p> <p>A1 M4 Lesson 17: Rewriting Square Roots</p>

Quantities

Reason quantitatively and use units to solve problems.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.N.4</p> <p>Use units in context as a way to understand problems and to guide the solution of multi-step problems;</p>	<p><i>This standard is fully addressed by the lesson aligned to its subsections.</i></p>
<p>KY.HS.N.4.a</p> <p>Choose and interpret units consistently in formulas;</p>	<p>A1 M6 Lesson 5: Solar System Models</p>
<p>KY.HS.N.4.b</p> <p>Choose and interpret the scale and the origin in graphs and data displays.</p>	<p>A1 M6 Lesson 5: Solar System Models</p>
<p>KY.HS.N.5</p> <p>Define appropriate units in context for the purpose of descriptive modeling.</p>	<p>A1 M4 Lesson 25: Maximizing Area A1 M6 Lesson 5: Solar System Models</p>
<p>KY.HS.N.6</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p>	<p>A1 M6 Lesson 5: Solar System Models A1 M6 Lesson 6: Polynomial Identities</p>

Seeing Structure in Expressions

Interpret the structure of expressions.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.1</p> <p>Interpret expressions that represent a quantity in terms of its context.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.A.1.a</p> <p>Interpret parts of an expression, such as terms, factors and coefficients.</p>	<p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p>
<p>KY.HS.A.1.b</p> <p>Interpret complicated expressions, given a context, by viewing one or more of their parts as a single entity.</p>	<p>A1 M5 Lesson 8: Exponential Functions</p> <p>A1 M5 Lesson 16: Exponential Growth</p> <p>A1 M5 Lesson 17: Exponential Decay</p> <p>A1 M5 Lesson 18: Modeling Populations</p> <p>A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p>

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<p>KY.HS.A.2</p> <p>Use the structure of an expression to identify ways to rewrite it and consistently look for opportunities to rewrite expressions in equivalent forms.</p>	<p>A1 M1 Lesson 1: The Growing Pattern of Ducks</p> <p>A1 M1 Lesson 2: The Commutative, Associative, and Distributive Properties</p> <p>A1 M1 Lesson 3: Polynomial Expressions</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions</p> <p>A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check</p> <p>A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term</p> <p>A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring</p> <p>A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable</p> <p>A1 M4 Lesson 10: Zeros of Functions</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square</p> <p>A1 M4 Lesson 15: Deriving the Quadratic Formula</p> <p>A1 M5 Lesson 11: Graphing Exponential Functions</p> <p>A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1)</p> <p>A1 M5 Lesson 18: Modeling Populations</p>
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Seeing Structure in Expressions

Write expressions in equivalent forms to solve problems.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.3</p> <p>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.A.3.a</p> <p>Write the standard form of a given polynomial and identify the terms, coefficients, degree, leading coefficient and constant term.</p>	<p>A1 M1 Lesson 3: Polynomial Expressions</p>
<p>KY.HS.A.3.b</p> <p>Factor a quadratic expression to reveal the zeros of the function it defines.</p>	<p>A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions</p>
<p>KY.HS.A.3.c</p> <p>Use the properties of exponents to rewrite exponential expressions.</p>	<p>A1 M5 Lesson 11: Graphing Exponential Functions A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1) A1 M5 Lesson 18: Modeling Populations</p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.3.d</p> <p>Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.</p>	<p>A1 M4 Lesson 1: Falling Objects</p> <p>A1 M4 Lesson 2: Projectile Motion</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions</p> <p>A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions</p>

Arithmetic with Polynomials and Rational Expressions

Perform arithmetic operations on polynomials.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.5</p> <p>Add, subtract and multiply polynomials.</p>	<p>A1 M1 Lesson 3: Polynomial Expressions</p> <p>A1 M1 Lesson 4: Adding and Subtracting Polynomial Expressions</p> <p>A1 M1 Lesson 5: Multiplying Polynomial Expressions</p> <p>A1 M1 Lesson 6: Polynomial Identities</p>

Arithmetic with Polynomials and Rational Expressions

Understand the relationship between zeros and factors of polynomials.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.7</p> <p>Identify roots of polynomials when suitable factorizations are available. Know these roots become the zeros (x-intercepts) for the corresponding polynomial function.</p>	<p>A1 M4 Lesson 10: Zeros of Functions</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions</p>

Creating Equations

Create equations that describe numbers or relationships.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.12</p> <p>Create equations and inequalities in one variable and use them to solve problems.</p>	<p>A1 M1 Lesson 7: Printing Presses</p> <p>A1 M1 Lesson 11: Writing and Solving Equations in One Variable</p> <p>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable</p> <p>A1 M1 Lesson 14: Solution Sets of Compound Statements</p> <p>A1 M1 Lesson 15: Solving and Graphing Compound Inequalities</p> <p>A1 M1 Lesson 16: Solving Absolute Value Equations</p> <p>A1 M1 Lesson 17: Solving Absolute Value Inequalities</p> <p>A1 M1 Lesson 18: Applying Absolute Value</p> <p>A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable</p>

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<p>KY.HS.A.13</p> <p>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.</p>	<p>A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables</p> <p>A1 M2 Lesson 2: Graphing Linear Equations in Two Variables</p> <p>A1 M2 Lesson 3: Creating Linear Equations in Two Variables</p> <p>A1 M2 Lesson 6: Applications of Linear Equations and Inequalities</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p> <p>A1 M4 Lesson 25: Maximizing Area</p> <p>A1 M4 Lesson 26: Modeling Data with Quadratic Functions</p> <p>A1 M4 Lesson 27: Search and Rescue Helicopter</p>
<p>KY.HS.A.14</p> <p>Create a system of equations or inequalities to represent constraints within a modeling context. Interpret the solution(s) to the corresponding system as viable or nonviable options within the context.</p>	<p>A1 M2 Lesson 14: Applications of Systems of Equations</p> <p>A1 M6 Lesson 6: Designing a Fundraiser</p>
<p>KY.HS.A.15</p> <p>Rearrange formulas to solve a literal equation, highlighting a quantity of interest, using the same reasoning as in solving equations.</p>	<p>A1 M1 Lesson 12: Rearranging Formulas</p> <p>A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations</p>

Reasoning with Equations and Inequalities

Understand solving equations as a process of reasoning and explain the reasoning.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.16</p> <p>Understand 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.</p>	<p>A1 M1 Lesson 9: Solving Linear Equations in One Variable</p> <p>A1 M1 Lesson 10: Some Potential Dangers When Solving Equations</p> <p>A1 M1 Lesson 11: Writing and Solving Equations in One Variable</p>

Reasoning with Equations and Inequalities

Solve equations and inequalities in one variable.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.18</p> <p>Solve linear equations and inequalities in one variable, including literal equations with coefficients represented by letters.</p>	<p>A1 M1 Lesson 7: Printing Presses</p> <p>A1 M1 Lesson 8: Solution Sets for Equations and Inequalities in One Variable</p> <p>A1 M1 Lesson 9: Solving Linear Equations in One Variable</p> <p>A1 M1 Lesson 10: Some Potential Dangers When Solving Equations</p> <p>A1 M1 Lesson 11: Writing and Solving Equations in One Variable</p> <p>A1 M1 Lesson 12: Rearranging Formulas</p> <p>A1 M1 Lesson 13: Solving Linear Inequalities in One Variable</p> <p>A1 M1 Lesson 14: Solution Sets of Compound Statements</p> <p>A1 M1 Lesson 15: Solving and Graphing Compound Inequalities</p> <p>A1 M1 Lesson 16: Solving Absolute Value Equations</p>

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<p>KY.HS.A.18 <i>continued</i></p>	<p>A1 M1 Lesson 17: Solving Absolute Value Inequalities A1 M1 Lesson 18: Applying Absolute Value</p>
<p>KY.HS.A.19 Solve quadratic equations in one variable.</p>	<p><i>This standard is addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.A.19.a Solve quadratic equations by taking square roots, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.</p>	<p>A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square A1 M4 Lesson 15: Deriving the Quadratic Formula A1 M4 Lesson 16: Solving Quadratic Equations A1 M4 Lesson 18: The Quadratic Formula and Zeros of a Function <i>Supplemental material is necessary to address writing complex solutions.</i></p>
<p>KY.HS.A.19.b Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.</p>	<p>A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square A1 M4 Lesson 15: Deriving the Quadratic Formula</p>

Reasoning with Equations and Inequalities

Solve systems of equations.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.20</p> <p>Solve systems of linear equations in two variables.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.A.20.a</p> <p>Understand a system of two equations in two variables has the same solution as a new system formed by replacing one of the original equations with an equivalent equation.</p>	<p>A1 M2 Lesson 9: A New Way to Solve Systems</p>
<p>KY.HS.A.20.b</p> <p>Solve systems of linear equations with graphs, substitution and elimination, focusing on pairs of linear equations in two variables.</p>	<p>A1 M2 Lesson 7: Low-Flow Showerhead</p> <p>A1 M2 Lesson 8: Systems of Linear Equations in Two Variables</p> <p>A1 M2 Lesson 9: A New Way to Solve Systems</p> <p>A1 M2 Lesson 10: The Elimination Method</p> <p>A1 M2 Lesson 11: Applications of Systems of Equations</p>
<p>KY.HS.A.21</p> <p>Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.</p>	<p>A1 M4 Lesson 24: Another Look at Systems of Equations</p>

Reasoning with Equations and Inequalities

Represent and solve equations and inequalities graphically.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.A.23</p> <p>Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.</p>	<p>A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables</p> <p>A1 M2 Lesson 2: Graphing Linear Equations in Two Variables</p>
<p>KY.HS.A.24</p> <p>Justify that the solutions of the equations $f(x) = g(x)$ are the x-coordinates of the points where the graphs of $y = f(x)$ and $y = g(x)$ intersect. Find the approximate solutions graphically, using technology or tables.</p>	<p>A1 M3 Lesson 11: Using Graphs to Solve Equations</p> <p>A1 M3 Lesson 15: Piecewise Linear Functions</p> <p>A1 M4 Lesson 24: Another Look at Systems of Equations</p> <p>A1 M5 Lesson 13: Using Transformations to Graph Exponential Functions (Bases Between 0 and 1)</p> <p>A1 M5 Lesson 20: Comparing Growth of Functions</p>
<p>KY.HS.A.25</p> <p>Graph linear inequalities in two variables.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.A.25.a</p> <p>Graph the solutions to a linear inequality as a half-plane (excluding the boundary in the case of a strict inequality).</p>	<p>A1 M2 Lesson 4: Solution Sets of Linear Inequalities in Two Variables</p> <p>A1 M2 Lesson 5: Graphing Linear Inequalities in Two Variables</p> <p>A1 M6 Lesson 6: Designing a Fundraiser</p>
<p>KY.HS.A.25.b</p> <p>Graph the solution set to a system of linear inequalities as the intersection of the corresponding half-planes.</p>	<p>A1 M2 Lesson 12: Solution Sets of Systems of Linear Inequalities</p> <p>A1 M2 Lesson 13: Graphing Solution Sets of Systems of Linear Inequalities</p> <p>A1 M2 Lesson 14: Applications of Systems of Linear Inequalities</p>

Interpreting Functions

Understand the concept of a function and use function notation.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.1</p> <p>Understand properties and key features of functions and the different ways functions can be represented.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.F.1.a</p> <p>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.</p>	<p>A1 M3 Lesson 1: The Definition of a Function</p> <p>A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions</p> <p>A1 M3 Lesson 3: The Graph of a Function</p> <p>A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$</p> <p>A1 M3 Lesson 5: Using Pseudocode to Compare Graphs of Functions and Graphs of Equations</p> <p>A1 M3 Lesson 6: Representations of Functions</p> <p>A1 M3 Lesson 7: Inverses of Linear Functions</p>
<p>KY.HS.F.1.b</p> <p>Using appropriate function notation, evaluate functions for inputs in their domains and interpret statements that use function notation in terms of a context.</p>	<p>A1 M3 Lesson 1: The Definition of a Function</p> <p>A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions</p> <p>A1 M3 Lesson 6: Representations of Functions</p> <p>A1 M3 Lesson 17: Step Functions</p> <p>A1 M5 Lesson 1: Exploring Patterns</p> <p>A1 M5 Lesson 2: The Recursive Challenge</p> <p>A1 M5 Lesson 3: Recursive Formulas for Sequences</p> <p>A1 M5 Lesson 4: Explicit Formulas for Sequences</p> <p>A1 M5 Lesson 7: Sierpinski Triangle</p>

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<p>KY.HS.F.1.c</p> <p>For 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.</p>	<p>A1 M3 Lesson 8: Exploring Key Features of a Function and Its Graph</p> <p>A1 M3 Lesson 9: Identifying Key Features of a Function and Its Graph</p> <p>A1 M3 Lesson 10: Representing Functions from Verbal Descriptions</p> <p>A1 M3 Lesson 12: Comparing Functions</p> <p>A1 M3 Lesson 13: Mars Curiosity Rover</p> <p>A1 M3 Lesson 14: Modeling Elevation as a Function of Time</p> <p>A1 M4 Lesson 1: Falling Objects</p> <p>A1 M4 Lesson 2: Projectile Motion</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions</p> <p>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p> <p>A1 M4 Lesson 25: Maximizing Area</p>
<p>KY.HS.F.1.d</p> <p>Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.</p>	<p>A1 M3 Lesson 3: The Graph of a Function</p> <p>A1 M3 Lesson 14: Modeling Elevation as a Function of Time</p> <p>A1 M3 Lesson 17: Step Functions</p> <p>A1 M4 Lesson 2: Projectile Motion</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.1.e</p> <p>Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).</p>	<p>A1 M3 Lesson 12: Comparing Functions</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions</p>
<p>KY.HS.F.2</p> <p>Recognize that arithmetic and geometric sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.</p>	<p>A1 M5 Lesson 1: Exploring Patterns</p> <p>A1 M5 Lesson 2: The Recursive Challenge</p> <p>A1 M5 Lesson 3: Recursive Formulas for Sequences</p> <p>A1 M5 Lesson 4: Explicit Formulas for Sequences</p> <p>A1 M5 Lesson 5: Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 6: Representations of Arithmetic and Geometric Sequences</p>

Interpreting Functions

Interpret functions that arise in applications in terms of the context.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.3</p> <p>Understand average rate of change of a function over an interval.</p>	<p><i>This standard is addressed by the lessons aligned to its subsections.</i></p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.3.a</p> <p>Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.</p>	<p>A1 M4 Lesson 1: Falling Objects</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M5 Lesson 19: Analyzing Exponential Growth</p> <p>A1 M5 Lesson 20: Comparing Growth of Functions</p> <p>A1 M5 Lesson 24: Modeling an Invasive Species Population</p>
<p>KY.HS.F.3.b</p> <p>Estimate the rate of change from a graph.</p>	<p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p>

Interpreting Functions

Analyze functions using different representations.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.4</p> <p>Graph functions expressed symbolically and show key features of the graph, with and without using technology (computer, graphing calculator).</p>	<p><i>This standard is addressed by the lessons aligned to its subsections.</i></p>

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<p>KY.HS.F.4.a</p> <p>Graph linear and quadratic functions and show intercepts, maxima and minima.</p>	<p>A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$</p> <p>A1 M3 Lesson 5: Using Pseudocode to Compare Graphs of Functions and Graphs of Equations</p> <p>A1 M3 Lesson 6: Representations of Functions</p> <p>A1 M4 Lesson 4: Graphs of Quadratic Functions</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 19: Transforming the Graphs of Quadratic Functions</p>
<p>KY.HS.F.4.b</p> <p>Graph square root, cube root and absolute value functions.</p>	<p>A1 M3 Lesson 16: The Absolute Value Function</p> <p>A1 M3 Lesson 20: Building New Functions—Translations</p> <p>A1 M3 Lesson 24: A Summary of Transforming the Graph of a Function</p> <p><i>Supplemental material is necessary to address graphing cube root functions.</i></p>
<p>KY.HS.F.4.d</p> <p>Graph exponential and logarithmic functions, showing intercepts and end behavior.</p>	<p>A1 M5 Lesson 11: Graphing Exponential Functions</p> <p>A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1)</p> <p>A1 M5 Lesson 13: Using Transformations to Graph Exponential Functions (Bases Between 0 and 1)</p> <p><i>Supplemental material is necessary to address graphing logarithmic functions.</i></p>
<p>KY.HS.F.5</p> <p>Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.5.a</p> <p>Identify zeros, extreme values and symmetry of the graph within the context of a quadratic function.</p>	<p>A1 M4 Lesson 1: Falling Objects</p> <p>A1 M4 Lesson 2: Projectile Motion</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 10: Zeros of Functions</p> <p>A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p> <p>A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions</p>
<p>KY.HS.F.5.b</p> <p>Use the properties of exponents to interpret expressions for exponential functions and classify the exponential function as representing growth or decay.</p>	<p>A1 M5 Lesson 11: Graphing Exponential Functions</p> <p>A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1)</p> <p>A1 M5 Lesson 18: Modeling Populations</p>

Building Functions

Build a function that models a relationship between two quantities.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.6</p> <p>Write a function that describes a relationship between two quantities.</p>	<p>A1 M4 Lesson 1: Falling Objects</p> <p>A1 M4 Lesson 2: Projectile Motion</p> <p>A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion</p> <p>A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form</p>

Kentucky Mathematics Course Standards

Aligned Components of *Eureka Math*²

<p>KY.HS.F.6.a</p> <p>Determine an explicit expression, a recursive process, or steps for calculation from a context.</p>	<p>A1 M3 Lesson 18: Piecewise Linear Functions in Context</p> <p>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p> <p>A1 M4 Lesson 25: Maximizing Area</p> <p>A1 M4 Lesson 26: Modeling Data with Quadratic Functions</p> <p>A1 M4 Lesson 27: Search and Rescue Helicopter</p> <p>A1 M5 Lesson 1: Exploring Patterns</p> <p>A1 M5 Lesson 2: The Recursive Challenge</p> <p>A1 M5 Lesson 3: Recursive Formulas for Sequences</p> <p>A1 M5 Lesson 4: Explicit Formulas for Sequences</p> <p>A1 M5 Lesson 5: Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 6: Representation of Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 7: Sierpinski Triangle</p> <p>A1 M5 Lesson 8: Exponential Functions</p> <p>A1 M5 Lesson 15: Calculating Interest</p> <p>A1 M6 Lesson 4: The Deal</p> <p>A1 M6 Lesson 7: World Record Doughnut</p>
<p>KY.HS.F.6.b</p> <p>Combine standard function types using arithmetic operations.</p>	<p>A1 M6 Lesson 4: The Deal</p> <p>A1 M6 Lesson 7: World Record Doughnut</p>
<p>KY.HS.F.7</p> <p>Use arithmetic and geometric sequences to model situations and scenarios.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.7.a</p> <p>Use formulas (explicit and recursive) to generate terms for arithmetic and geometric sequences.</p>	<p>A1 M5 Lesson 5: Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 6: Representations of Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 7: Sierpinski Triangle</p>
<p>KY.HS.F.7.b</p> <p>Write formulas to model arithmetic and geometric sequences and apply those formulas in realistic situations.</p>	<p>A1 M5 Lesson 6: Representations of Arithmetic and Geometric Sequences</p> <p>A1 M5 Lesson 7: Sierpinski Triangle</p>

Building Functions

Build new functions from existing functions.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.8 Understand the effects of transformations on the graph of a function.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.F.8.a Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.</p>	<p>A1 M3 Lesson 19: Exploring Transformations of the Graphs of Functions A1 M3 Lesson 20: Building New Functions—Translations A1 M3 Lesson 21: Building New Functions –Reflections A1 M3 Lesson 22: Building New Functions—Vertical Scaling A1 M3 Lesson 23: Building New Functions—Horizontal Scaling A1 M3 Lesson 24: A Summary of Transforming the Graph of a Function A1 M4 Lesson 20: Art with Transformations A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1) A1 M5 Lesson 13: Using Transformations to Graph Exponential Functions (Bases Between 0 and 1) A1 M5 Lesson 14: Writing Equations for Exponential Functions from Tables or Graphs A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p>
<p>KY.HS.F.8.b Experiment with cases and illustrate an explanation of the effects on the graph using technology.</p>	<p>A1 M3 Lesson 19: Exploring Transformations of the Graphs of Functions A1 M4 Lesson 20: Art with Transformations</p>
<p>KY.HS.F.9 Find inverse functions.</p>	<p>A1 M3 Lesson 7: Inverses of Linear Functions</p>

Kentucky Mathematics Course Standards

Aligned Components of *Eureka Math*²

<p>KY.HS.F.9.a</p> <p>Given the equation of an invertible function, find the inverse.</p>	<p>A1 M3 Lesson 7: Inverses of Linear Functions</p>
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Linear, Quadratic and Exponential Functions

Construct and compare linear, quadratic and exponential models and solve problems.

Kentucky Mathematics Course Standards

Aligned Components of *Eureka Math*²

<p>KY.HS.F.11</p> <p>Distinguish between situations that can be modeled with linear functions and with exponential functions.</p>	<p>A1 M6 Lesson 1: Analyzing Paint Splatters</p> <p>A1 M6 Lesson 2: Using Residual Plots to Select Models for Data</p> <p>A1 M6 Lesson 3: Populations of US Cities</p>
<p>KY.HS.F.11.a</p> <p>Recognize and justify that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.</p>	<p>A1 M5 Lesson 15: Calculating Interest</p> <p>A1 M5 Lesson 19: Analyzing Exponential Growth</p>
<p>KY.HS.F.11.b</p> <p>Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.</p>	<p>A1 M5 Lesson 15: Calculating Interest</p> <p>A1 M5 Lesson 18: Modeling Populations</p> <p>A1 M5 Lesson 21: World Population Prediction</p> <p>A1 M5 Lesson 22: A Closer Look at Populations</p> <p>A1 M5 Lesson 24: Modeling an Invasive Species Population</p>

Kentucky Mathematics Course Standards

Aligned Components of *Eureka Math*²

<p>KY.HS.F.11.c</p> <p>Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.</p>	<p>A1 M5 Lesson 15: Calculating Interest</p> <p>A1 M5 Lesson 18: Modeling Populations</p> <p>A1 M5 Lesson 21: World Population Prediction</p> <p>A1 M5 Lesson 22: A Closer Look at Populations</p> <p>A1 M5 Lesson 24: Modeling an Invasive Species Population</p>
<p>KY.HS.F.12</p> <p>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).</p>	<p>A1 M5 Lesson 8: Exponential Functions</p> <p>A1 M5 Lesson 14: Writing Equations for Exponential Functions from Tables or Graphs</p> <p>A1 M5 Lesson 16: Exponential Growth</p> <p>A1 M5 Lesson 17: Exponential Decay</p> <p>A1 M5 Lesson 21: World Population Prediction</p> <p>A1 M5 Lesson 22: A Closer Look at Populations</p> <p>A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p> <p>A1 M5 Lesson 24: Modeling an Invasive Species Population</p> <p>A1 M6 Lesson 4: The Deal</p> <p>A1 M6 Lesson 7: World Record Doughnut</p>
<p>KY.HS.F.13</p> <p>Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.</p>	<p>A1 M5 Lesson 20: Comparing Growth of Functions</p>

Linear, Quadratic and Exponential Functions

Interpret expressions for functions in terms of the situation they model.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.F.14</p> <p>Interpret the parameters in a linear or exponential function in terms of a context.</p>	<p>A1 M5 Lesson 18: Modeling Populations</p> <p>A1 M5 Lesson 19: Analyzing Exponential Growth</p> <p>A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p> <p>A1 M5 Lesson 24: Modeling an Invasive Species Population</p>

Interpreting Categorical and Quantitative Data

Summarize, represent and interpret data on a single count or measurement variable.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.SP.1</p> <p>Represent the distribution of data with plots on the real number line (stem plots, dot plots, histograms and box plots).</p>	<p>A1 M1 Lesson 19: Distributions and Their Shapes</p> <p>A1 M1 Lesson 20: Describing the Center of a Distribution</p> <p>A1 M1 Lesson 21: Using Center to Compare Data Distributions</p> <p><i>Supplemental material is necessary to address stem plots.</i></p>
<p>KY.HS.SP.2</p> <p>Use statistics appropriate to the shape of the numerical data distribution to compare center (median, mean) and spread (interquartile range when comparing medians and standard deviation when comparing means) of different data distributions.</p>	<p>A1 M1 Lesson 19: Distributions and Their Shapes</p> <p>A1 M1 Lesson 20: Describing the Center of a Distribution</p> <p>A1 M1 Lesson 21: Using Center to Compare Data Distributions</p> <p>A1 M1 Lesson 22: Describing Variability in a Univariate Distribution with Standard Deviation</p> <p>A1 M1 Lesson 23: Estimating Variability in Data Distributions</p> <p>A1 M1 Lesson 24: Comparing Distributions of Univariate Data</p>

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.SP.3</p> <p>Interpret differences in shape, center and spread in the context of the distributions of the numerical data, accounting for the presence and possible effects of extreme data points (outliers).</p>	<p>A1 M1 Lesson 19: Distributions and Their Shapes</p> <p>A1 M1 Lesson 20: Describing the Center of a Distribution</p> <p>A1 M1 Lesson 21: Using Center to Compare Data Distributions</p> <p>A1 M1 Lesson 22: Describing Variability in a Univariate Distribution with Standard Deviation</p> <p>A1 M1 Lesson 23: Estimating Variability in Data Distributions</p> <p>A1 M1 Lesson 24: Comparing Distributions of Univariate Data</p>

Interpreting Categorical and Quantitative Data

Summarize, represent and interpret data on two categorical and quantitative variables.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.SP.5</p> <p>Summarize categorical data for two or more categories in frequency tables. Calculate and interpret joint, marginal and conditional relative frequencies (probabilities) in the context of the data, recognizing possible associations and trends in the data.</p>	<p>A1 M2 Lesson 22: Summarizing Bivariate Categorical Data with Two-Way Tables</p> <p>A1 M2 Lesson 23: Bivariate Categorical Data and Conditional Relative Frequency Tables</p> <p>A1 M2 Lesson 24: Conditional Relative Frequencies and Association</p>
<p>KY.HS.SP.6</p> <p>Represent data on two quantitative variables on a scatter plot and describe how the explanatory and response variables are related.</p>	<p>A1 M2 Lesson 15: Relationships Between Quantitative Variables</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p>

Kentucky Mathematics Course Standards

Aligned Components of *Eureka Math*²

<p>KY.HS.SP.6.a</p> <p>Calculate an appropriate mathematical model, or use a given mathematical model, for data to solve problems in context.</p>	<p>A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data</p> <p>A1 M2 Lesson 17: Modeling Relationships with a Line</p> <p>A1 M2 Lesson 18: Calculating and Analyzing Residuals</p> <p>A1 M2 Lesson 20: Interpreting Correlation</p> <p>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p> <p>A1 M4 Lesson 26: Modeling Data with Quadratic Functions</p> <p>A1 M4 Lesson 27: Search and Rescue Helicopter</p> <p>A1 M6 Lesson 1: Analyzing Paint Splatters</p> <p>A1 M6 Lesson 2: Using Residual Plots to Select Models for Data</p> <p>A1 M6 Lesson 3: Populations of US Cities</p>
<p>KY.HS.SP.6.b</p> <p>Informally assess the fit of a model (through calculating correlation for linear data, plotting, calculating and/or analyzing residuals).</p>	<p>A1 M2 Lesson 18: Calculating and Analyzing Residuals</p> <p>A1 M2 Lesson 19: Analyzing Residuals</p> <p>A1 M6 Lesson 1: Analyzing Paint Splatters</p> <p>A1 M6 Lesson 2: Using Residual Plots to Select Models for Data</p> <p>A1 M6 Lesson 3: Populations of US Cities</p>

Interpreting Categorical and Quantitative Data

Interpret linear models.

Kentucky Mathematics Course Standards	Aligned Components of <i>Eureka Math</i> ²
<p>KY.HS.SP.7</p> <p>Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</p>	<p>A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data</p> <p>A1 M2 Lesson 17: Modeling Relationships with a Line</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p>
<p>KY.HS.SP.8</p> <p>Understand the role and purpose of correlation in linear regression.</p>	<p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p>
<p>KY.HS.SP.8.a</p> <p>Use technology to compute correlation coefficient of a linear fit.</p>	<p>A1 M2 Lesson 20: Interpreting Correlation</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p>
<p>KY.HS.SP.8.b</p> <p>Interpret the meaning of the correlation within the context of the data.</p>	<p>A1 M2 Lesson 20: Interpreting Correlation</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p>
<p>KY.HS.SP.8.c</p> <p>Describe the limitations of correlation when establishing causation.</p>	<p>A1 M2 Lesson 20: Interpreting Correlation</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p>