
Algebra I | Maine Mathematics Standards (2020) 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 |
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| <p>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>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>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>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>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>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>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>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> |

Algebraic Reasoning—Algebra: Seeing Structure in Expressions

AR.A.1 Interpret the structure of expressions.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.1.HSA.SSE.A.1 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>AR.A.1. HSA.SSE.A.1a 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>AR.A.1. HSA.SSE.A.1b Interpret multi-part expressions by viewing one or more of their parts as a single entity.</p> | <p>A1 M5 Lesson 8: Exponential Functions A1 M5 Lesson 16: Exponential Growth A1 M5 Lesson 17: Exponential Decay A1 M5 Lesson 18: Modeling Populations A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p> |

Maine Mathematics Standards

Aligned Components of *Eureka Math*²

AR.A.1.HSA.SSE.A.2

Use the structure of an expression to identify ways to rewrite it.

- A1 M1 Lesson 1: The Growing Pattern of Ducks
- A1 M1 Lesson 2: The Commutative, Associative, and Distributive Properties
- A1 M1 Lesson 3: Polynomial Expressions
- A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion
- 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 10: Zeros of Functions
- A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form
- A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form
- A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square
- A1 M4 Lesson 15: Deriving the Quadratic Formula
- 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

Algebraic Reasoning—Algebra: Seeing Structure in Expressions

AR.A.2 Write expressions in equivalent forms to reveal information and to solve problems.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.2.HSA.SSE.B.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>AR.A.2.HSA.SSE.B.3a</p> <p>Rewrite a quadratic expression (such as by factoring) 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>AR.A.2.HSA.SSE.B.3b</p> <p>Rewrite a quadratic expression (such as by completing the square) to reveal the maximum or minimum value of the function it defines.</p> | <p>A1 M4 Lesson 1: Falling Objects A1 M4 Lesson 2: Projectile Motion A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions</p> |
| <p>AR.A.2.HSA.SSE.B.3c</p> <p>Use the properties of exponents to transform expressions for exponential functions.</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> |

Algebraic Reasoning—Algebra: Arithmetic with Polynomials & Rational Expressions

AR.A.3 Perform arithmetic operations on polynomials.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.3.HSA.APR.A.1</p> <p>Understand that polynomials form a system analogous to the integers, namely, they are closed under certain operations.</p> | <p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p> |
| <p>AR.A.3.HSA.APR.A.1a</p> <p>Perform operations on polynomial expressions (addition, subtraction, multiplication, and division), and compare the system of polynomials to the system of integers.</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> |
| <p>AR.A.3.HSA.APR.A.1b</p> <p>Factor and/or expand polynomial expressions, identify and combine like terms, and apply the Distributive Property.</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> |

Algebraic Reasoning—Algebra: Creating Equations and/or Inequalities

AR.A.7 Create equations and/or inequalities that describe numbers or relationships.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.7.HSA.CED.A.1</p> <p>Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i></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 15: Solving and Graphing Compound Inequalities</p> <p>A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable</p> |
| <p>AR.A.7.HSA.CED.A.2</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>AR.A.7.HSA.CED.A.3</p> <p>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.</p> | <p>A1 M1 Lesson 11: Writing and Solving Equations 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 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables</p> <p>A1 M2 Lesson 6: Applications of Linear Equations and Inequalities</p> <p>A1 M6 Lesson 5: Solar System Models</p> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| AR.A.7.HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. | A1 M1 Lesson 12: Rearranging Formulas A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations |

Algebraic Reasoning—Algebra: Reasoning with Equations & Inequalities

AR.A.8 Understand solving equations as a process of reasoning and explain the reasoning.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| AR.A.8.HSA.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 or refute a solution method. | A1 M1 Lesson 9: Solving Linear Equations in One Variable A1 M1 Lesson 10: Some Potential Dangers When Solving Equations A1 M1 Lesson 11: Writing and Solving Equations in One Variable |

Algebraic Reasoning—Algebra: Reasoning with Equations & Inequalities

AR.A.9 Solve equations and inequalities in one variable.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.9.HSA.REI.B.3</p> <p>Solve linear equations and inequalities in one variable, including 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 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>AR.A.9.HSA.REI.B.4</p> <p>Solve quadratic equations in one variable.</p> | <p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p> |
| <p>AR.A.9.HSA.REI.B.4a</p> <p>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</p> <p>A1 M4 Lesson 15: Deriving the Quadratic Formula</p> |

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| <p>AR.A.9.HSA.REI.B.4b.i</p> <p>Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation.</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 13: Using Square Roots to Solve Quadratic Equations</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 M4 Lesson 16: Solving Quadratic Equations</p> <p>A1 M4 Lesson 18: The Quadratic Formula and Zeros of a Function</p> |

Algebraic Reasoning—Algebra: Reasoning with Equations & Inequalities

AR.A.10 Solve systems of equations.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.10.HSA.REI.C.5</p> <p>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.</p> | <p>A1 M2 Lesson 9: A New Way to Solve Systems</p> |
| <p>AR.A.10.HSA.REI.C.6</p> <p>Solve systems of linear equations exactly and approximately (e.g., with graphs), 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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.10.HSA.REI.C.7</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> |

Algebraic Reasoning—Algebra: Reasoning with Equations & Inequalities

AR.A.11 Represent and solve equations and inequalities graphically.

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| <p>AR.A.11.HSA.REI.D.10</p> <p>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). Show that any point on the graph of an equation in two variables is a solution to the equation.</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>AR.A.11.HSA.REI.D.11</p> <p>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.</p> | <p>A1 M3 Lesson 11: Using Graphs to Solve Equations</p> <p>A1 M3 Lesson 16: The Absolute Value Function</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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.11.HSA.REI.D.12</p> <p>Graph the solutions of 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 of a system of linear inequalities in two variables as the intersection of the corresponding half-planes.</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 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> |

Algebraic Reasoning—Functions: Interpreting Functions

AR.A.12 Understand the concept of a function and use function notation.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.12.HSF.IF.A.1</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. The graph of f is the graph of the equation $y = f(x)$.</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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.12.HSF.IF.A.2</p> <p>Use 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> |
| <p>AR.A.12.HSF.IF.A.3</p> <p>Recognize that 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> |

Algebraic Reasoning—Functions: Interpreting Functions

AR.A.13 Interpret functions that arise in applications in terms of the context.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.13.HSF.IF.B.4</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. <i>Key features may include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative and absolute maximums and minimums; symmetries; end behavior; and periodicity.</i></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>AR.A.13.HSF.IF.B.5</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> |

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| <p>AR.A.13.HSF.IF.B.6</p> <p>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.</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> |

Algebraic Reasoning—Functions: Interpreting Functions

AR.A.14 Analyze functions using different representations.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.14.HSF.IF.C.7</p> <p>Graph functions expressed symbolically as well as show and describe key features of the graph, by hand in simple cases and using technology for more complicated cases.</p> | <p><i>This standard is fully addressed by the lessons aligned to its subsections.</i></p> |
| <p>AR.A.14.HSF.IF.C.7a</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>A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts</p> |

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| <p>AR.A.14.HSF.IF.C.7b.i</p> <p>Graph square root and piecewise-defined functions (including step functions and absolute value functions), as well as show and describe key features of the graph.</p> | <p>A1 M3 Lesson 14: Modeling Elevation as a Function of Time</p> <p>A1 M3 Lesson 15: Piecewise Linear Functions</p> <p>A1 M3 Lesson 16: The Absolute Value Function</p> <p>A1 M3 Lesson 17: Step Functions</p> <p>A1 M3 Lesson 18: Piecewise Linear Functions in Context</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>Supplementary material is necessary to address graphing square root functions.</i></p> |
| <p>AR.A.14.HSF.IF.C.7e.i</p> <p>Graph exponential 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>AR.A.14.HSF.IF.C.8</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> |
| <p>AR.A.14.HSF.IF.C.8a</p> <p>Use the process of factoring and completing the square in a quadratic function to show zeros, maximum and minimum values, and symmetry of the graph, and interpret these in terms of a context.</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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.14.HSF.IF.C.8b</p> <p>Use the properties of exponents to interpret expressions for exponential functions.</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> |
| <p>AR.A.14.HSF.IF.C.9</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> |

Algebraic Reasoning—Functions: Building Functions

AR.A.15 Build a function that models a relationship between two quantities.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.15.HSF.BF.A.1</p> <p>Write a function that describes a relationship between two quantities.</p> | <p>A1 M6 Lesson 5: Solar System Models</p> |
| <p>AR.A.15.HSF.BF.A.1a</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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.15.HSF.BF.A.1a <i>continued</i></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 5: Solar System Models</p> <p>A1 M6 Lesson 6: Designing a Fundraiser</p> <p>A1 M6 Lesson 7: World Record Doughnut</p> |
| <p>AR.A.15.HSF.BF.A.1b</p> <p>Combine standard function types using arithmetic operations.</p> | <p>A1 M6 Lesson 4: The Deal</p> <p>A1 M6 Lesson 6: Designing a Fundraiser</p> <p>A1 M6 Lesson 7: World Record Doughnut</p> |
| <p>AR.A.15.HSF.BF.A.2</p> <p>Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.</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> |

Algebraic Reasoning—Functions: Building Functions

AR.A.16 Build new functions from existing functions.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.16.HSF.BF.B.3</p> <p>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. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.</p> | <p>A1 M3 Lesson 19: Exploring Transformations of the Graphs of Functions</p> <p>A1 M3 Lesson 20: Building New Functions—Translations</p> <p>A1 M3 Lesson 21: Building New Functions—Reflections</p> <p>A1 M3 Lesson 22: Building New Functions—Vertical Scaling</p> <p>A1 M3 Lesson 23: Building New Functions—Horizontal Scaling</p> <p>A1 M3 Lesson 24: A Summary of Transforming the Graph of a Function</p> <p>A1 M4 Lesson 20: Art with Transformations</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>A1 M5 Lesson 14: Writing Equations for Exponential Functions from Tables or Graphs</p> <p>A1 M5 Lesson 23: Modeling the Temperature of Objects Cooling Over Time</p> |
| <p>AR.A.16.HSF.BF.B.4</p> <p>Find inverse functions.</p> | <p>A1 M3 Lesson 7: Inverses of Linear Functions</p> |
| <p>AR.A.16.HSF.BF.B.4a</p> <p>Solve an equation of the form $f(x) = c$ (where c represents the output value of the function) for a simple function f that has an inverse and write an expression for the inverse.</p> | <p>A1 M3 Lesson 7: Inverses of Linear Functions</p> |

Algebraic Reasoning—Functions: Linear, Quadratic, & Exponential Models

AR.A.17 Construct and compare linear, quadratic, and exponential models and solve problems.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.17.HSF.LE.A.1</p> <p>Distinguish between situations that can be modeled with linear functions and with exponential functions.</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>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>AR.A.17.HSF.LE.A.1a</p> <p>Prove 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 19: Analyzing Exponential Growth</p> |
| <p>AR.A.17.HSF.LE.A.1b</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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.17.HSF.LE.A.1c</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>AR.A.17.HSF.LE.A.2</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 5: Solar System Models</p> <p>A1 M6 Lesson 6: Designing a Fundraiser</p> <p>A1 M6 Lesson 7: World Record Doughnut</p> |
| <p>AR.A.17.HSF.LE.A.3</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> |

Algebraic Reasoning—Functions: Linear, Quadratic, & Exponential Models

AR.A.18 Interpret expressions for function in terms of the situation they model.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>AR.A.18.HSF.LE.B.5</p> <p>Interpret the parameters in a linear or exponential function in terms of a context.</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 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> |

Quantitative Reasoning—Number and Quantity: The Real Number System

QR.A.1 Extend the properties of exponents to rational exponents.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>QR.A.1.HSN.RN.A.1</p> <p>Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for 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>QR.A.1.HSN.RN.A.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> |

Quantitative Reasoning—Number and Quantity: The Real Number System

QR.A.2 Use properties of rational and irrational numbers.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>QR.A.2.HSN.RN.B.3</p> <p>Explain when and why the sum or product of two rational and/or irrational numbers is rational or irrational.</p> | <p>A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations</p> <p>A1 M4 Lesson 17: Rewriting Square Roots</p> |

Quantitative Reasoning—Number and Quantity: Quantities

QR.A.3 Reason quantitatively and use units to solve problems.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>QR.A.3.HSN.Q.A.1</p> <p>Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.</p> | <p>A1 M6 Lesson 5: Solar System Models</p> |
| <p>QR.A.3.HSN.Q.A.2</p> <p>Define appropriate quantities for the purpose of descriptive modeling.</p> | <p>A1 M4 Lesson 25: Maximizing Area</p> <p>A1 M6 Lesson 5: Solar System Models</p> |
| <p>QR.A.3.HSN.Q.A.3</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.</p> | <p>A1 M6 Lesson 5: Solar System Models</p> <p>A1 M6 Lesson 6: Polynomial Identities</p> |

Statistical Reasoning—Statistics & Probability: Interpreting Categorical & Quantitative Data

SR.A.1 Summarize, represent, and interpret data on a single count or measurement variable.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>SR.A.1.HSS.ID.A.1</p> <p>Represent data with plots on the real number line (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>SR.A.1.HSS.ID.A.2</p> <p>Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</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> |
| <p>SR.A.1.HSS.ID.A.3</p> <p>Interpret differences in shape, center, and spread in the context of the data sets, accounting for 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> |

Statistical Reasoning—Statistics & Probability: Interpreting Categorical & Quantitative Data

SR.A.2 Summarize, represent, and interpret data on two categorical variables and two quantitative variables.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>SR.A.2.HSS.ID.B.5</p> <p>Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize 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>SR.A.2.HSS.ID.B.6</p> <p>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> | <p>A1 M2 Lesson 15: Relationships Between Quantitative Variables</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p> |
| <p>SR.A.2.HSS.ID.B.6a</p> <p>Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</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 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> |

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>SR.A.2.HSS.ID.B.6b</p> <p>Informally assess the fit of a function by plotting and 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> |
| <p>SR.A.2.HSS.ID.B.6c</p> <p>Fit a linear function for a scatter plot that suggests a linear association.</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 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> |

Statistical Reasoning—Statistics & Probability: Interpreting Categorical & Quantitative Data

SR.A.3 Interpret linear models.

| Maine Mathematics Standards | Aligned Components of <i>Eureka Math</i> ² |
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| <p>SR.A.3.HSS.ID.C.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 21: Analyzing Bivariate Quantitative Data</p> |
| <p>SR.A.3.HSS.ID.C.8</p> <p>Compute (using technology) and interpret the 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>SR.A.3.HSS.ID.C.9</p> <p>Distinguish between correlation and causation.</p> | <p>A1 M2 Lesson 20: Interpreting Correlation</p> <p>A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data</p> |