Algebra II | Georgia's K–12 Mathematics Standards 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

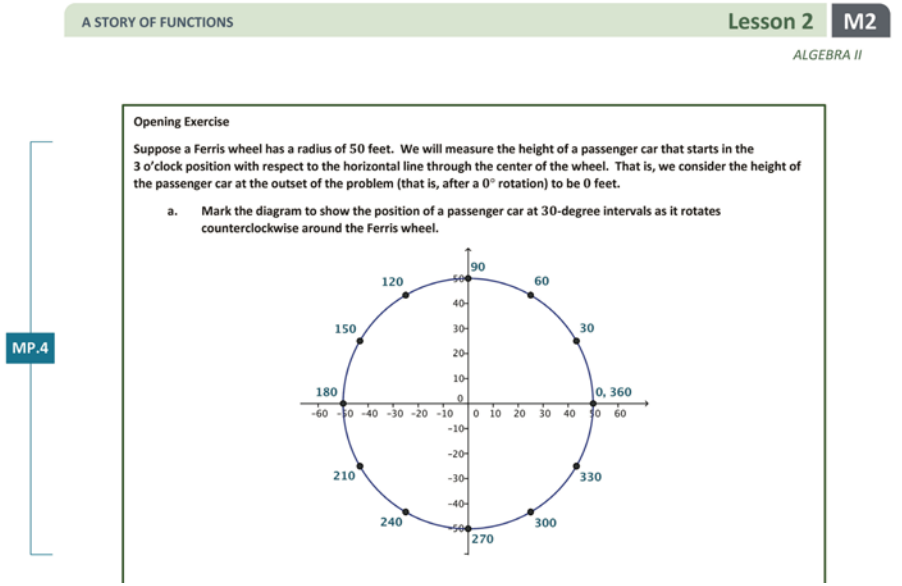
Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

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

Standards for Mathematical Practice	Aligned Components of *Eureka Math*
MP.1 Make sense of problems and persevere in solving them.	Lessons in every module engage students in mathematical practices. These are designated in the Module Overview and labeled in lessons. For example: 
MP.2 Reason abstractly and quantitatively.	
MP.3 Construct viable arguments and critique the reasoning of others.	
MP.4 Model with mathematics.	
MP.5 Use appropriate tools strategically.	
MP.6 Attend to precision.	
MP.7 Look for and make use of structure.	
MP.8 Look for and express regularity in repeated reasoning.	

Mathematical Modeling Framework	Aligned Components of *Eureka Math*
MF.1 Explore and describe real-life, mathematical situations or problems.	Lessons in every module engage students in mathematical modeling.
MF.2 Gather information, make assumptions, and define variables related to the problem.	
MF.3 Create a model and arrive at a solution to explain the problem presented.	
MF.4 Analyze and revise models, as necessary.	
MF.5 Evaluate the model and interpret solutions generated from other models. Draw and validate conclusions.	

Framework for Statistical Reasoning	Aligned Components of *Eureka Math*
SR.I **Formulate Statistical Investigative Questions** Ask questions that anticipate variability.	Lessons in Module 4 engage students in statistical reasoning.
SR.II **Collect & Consider the Data** Ensure that data collection designs acknowledge variability.	
SR.III **Analyze the Data** Make sense of data and communicate what the data mean using pictures (graphs) and words. Give an accounting of variability, as appropriate.	
SR.IV **Interpret the Results** Answer statistical investigative questions based on the collected data.	

Data & Statistical Reasoning—descriptive and inferential statistics

AA.DSR.2 Communicate descriptive and inferential statistics by collecting, critiquing, analyzing, and interpreting real-world data.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.DSR.2.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. Distinguish between primary and secondary data and how it affects the types of conclusions that can be drawn.	Algebra II M4 Lesson 12: Types of Statistical Studies Algebra II M4 Lesson 23: Experiments and the Role of Random Assignment Algebra II M4 Lesson 24: Differences Due to Random Assignment Alone Algebra II M4 Lesson 25: Ruling Out Chance Algebra II M4 Lesson 26: Ruling Out Chance Algebra II M4 Lesson 27: Ruling Out Chance Algebra II M4 Lesson 28: Drawing a Conclusion from an Experiment Algebra II M4 Lesson 29: Drawing a Conclusion from an Experiment *Supplemental material is necessary to address distinguishing between primary and secondary data and how it affects the types of conclusions that can be drawn.*
AA.DSR.2.2 When collecting and considering data, critically evaluate ethics, privacy, potential bias, and confounding variables along with their implications for interpretation in answering a statistical investigative question. Implement strategies for organizing and preparing big data sets.	*Supplemental material is necessary to address this standard.*

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.DSR.2.3 Distinguish between population distributions, sample data distributions, and sampling distributions. Use sample statistics to make inferences about population parameters based on a random sample from that population and to communicate conclusions using appropriate statistical language.	Algebra II M4 Lesson 14: Sampling Variability in the Sample Proportion Algebra II M4 Lesson 15: Sampling Variability in the Sample Proportion Algebra II M4 Lesson 18: Sampling Variability in the Sample Mean Algebra II M4 Lesson 19: Sampling Variability in the Sample Mean
AA.DSR.2.4 Calculate and interpret z-scores as a measure of relative standing and as a method of standardizing units.	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
AA.DSR.2.5 Given a normally distributed population, estimate percentages using the Empirical Rule, z-scores, and technology.	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
AA.DSR.2.6 Model sample-to-sample variability in sampling distributions of a statistic using simulations taken from a given population.	*Supplemental material is necessary to address this standard.*

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.DSR.2.7 Given a margin of error, develop and compare confidence intervals of different models to make conclusions about reliability.	Algebra II M4 Lesson 14: Sampling Variability in the Sample Proportion Algebra II M4 Lesson 15: Sampling Variability in the Sample Proportion Algebra II M4 Lesson 16: Margin of Error When Estimating a Population Proportion Algebra II M4 Lesson 17: Margin of Error When Estimating a Population Proportion Algebra II M4 Lesson 18: Sampling Variability in the Sample Mean Algebra II M4 Lesson 19: Sampling Variability in the Sample Mean Algebra II M4 Lesson 20: Margin of Error When Estimating a Population Mean Algebra II M4 Lesson 21: Margin of Error When Estimating a Population Mean
AA.DSR.2.8 Summarize and evaluate reports based on data for appropriateness of study design, analysis methods, and statistical measures used.	Algebra II M4 Lesson 22: Evaluating Reports Based on Data from a Sample Algebra II M4 Lesson 30: Evaluating Reports Based on Data from an Experiment

Functional & Graphical Reasoning—exponential and logarithmic functions

AA.FGR.3 Explore and analyze structures and patterns for exponential and logarithmic functions and use exponential and logarithmic expressions, equations, and functions to model real-life phenomena.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.3.1 Find the inverse of exponential and logarithmic functions using equations, tables, and graphs, limiting the domain of inverses where necessary to maintain functionality, and prove by composition or verify by inspection that one function is the inverse of another.	Algebra II M3 Lesson 15: Why Were Logarithms Developed? Algebra II M3 Lesson 18: Graphs of Exponential Functions and Logarithmic Functions Algebra II M3 Lesson 19: The Inverse Relationship Between Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 20: Inverses of Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 21: Logarithmic and Exponential Problem Solving
AA.FGR.3.2 Analyze, graph, and compare exponential and logarithmic functions.	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 33: The Million Dollar Problem
AA.FGR.3.3 Use the definition of a logarithm, logarithmic properties, and the inverse relationship between exponential and logarithmic functions to solve problems in context.	Precalculus and Advanced Topics M3 Lesson 20: Inverses of Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 21: Logarithmic and Exponential Problem Solving
AA.FGR.3.4 Create exponential equations and use logarithms to solve mathematical, applicable problems for which only one variable is unknown.	Algebra II M3 Lesson 24: Solving Exponential Equations 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 20: Inverses of Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 21: Logarithmic and Exponential Problem Solving

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.3.5 Create and interpret logarithmic equations in one variable and use them to solve problems.	Algebra II M3 Lesson 14: Solving Logarithmic Equations Algebra II M3 Lesson 15: Why Were Logarithms Developed? *Supplemental material is necessary to address creating and interpreting logarithmic equations in one variable.*
AA.FGR.3.6 Create, interpret, and solve exponential equations to represent relationships between quantities and analyze the relationships numerically with tables, algebraically, and graphically.	Algebra II M3 Lesson 24: Solving Exponential Equations 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 20: Inverses of Logarithmic and Exponential Functions Precalculus and Advanced Topics M3 Lesson 21: Logarithmic and Exponential Problem Solving
AA.FGR.3.7 Create, interpret, and solve logarithmic equations in two or more variables to represent relationships between quantities.	*Supplemental material is necessary to address this standard.*

Functional & Graphical Reasoning—radical functions

AA.FGR.4 Explore and analyze structures and patterns for radical functions and use radical expressions, equations, and functions to model real-life phenomena.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.4.1 Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.	Algebra II M3 Lesson 1: Integer Exponents Algebra II M3 Lesson 3: Rational Exponents Algebra II M3 Lesson 4: Properties of Exponents and Radicals

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.4.2 Solve radical equations in one variable, and give examples showing how extraneous solutions may arise.	Algebra II M1 Lesson 28: A Focus on Square Roots Algebra II M1 Lesson 29: Solving Radical Equations
AA.FGR.4.3 Analyze and graph radical 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 *Supplemental material is necessary to fully address this standard.*
AA.FGR.4.4 Create, interpret and solve radical equations with one unknown value and use them to solve problems that model real-world situations.	Algebra I M5 Lesson 1: Analyzing a Graph Algebra I M5 Lesson 4: Modeling a Context from a Graph *Supplemental material is necessary to fully address this standard.*
AA.FGR.4.5 Create, interpret, and solve radical equations in two or more variables to represent relationships between quantities.	*Supplemental material is necessary to address this standard.*

Functional & Graphical Reasoning—polynomial functions

AA.FGR.5 Extend exploration of quadratic solutions to include real and non-real numbers and explore how these numbers behave under familiar operations and within real-world situations; create polynomial expressions, solve polynomial equations, graph polynomial functions, and model real-world phenomena.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.5.1 Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.	Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M4 Lesson 16: Graphing Quadratic Equations from the Vertex Form, $y = a(x - h)^2 + k$ Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ Algebra I M4 Lesson 23: Modeling with Quadratic Functions Algebra I M4 Lesson 24: Modeling with Quadratic Functions Algebra I M5 Lesson 7: Modeling a Context from Data
AA.FGR.5.2 Define complex numbers i such that $i^2 = -1$ and show that every complex number has the form $a + bi$ where a and b are real numbers and that the complex conjugate is $a - bi$.	Algebra II M1 Lesson 37: A Surprising Boost from Geometry Precalculus and Advanced Topics M1 Lesson 5: An Appearance of Complex Numbers
AA.FGR.5.3 Use the relation $i^2 = -1$ and the commutative, associative, and distributive 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

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.5.4 Use the structure of an expression to factor quadratics.	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 I M4 Lesson 5: The Zero Product Property Algebra I M4 Lesson 7: Creating and Solving Quadratic Equations in One Variable Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 13: Mastering Factoring Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm
AA.FGR.5.5 Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.	Algebra I M4 Lesson 7: Creating and Solving Quadratic Equations in One Variable Algebra I M4 Lesson 16: Graphing Quadratic Equations from the Vertex Form, $y = a(x - h)^2 + k$ Algebra I M4 Lesson 17: Graphing Quadratic Functions from the Standard Form, $f(x) = ax^2 + bx + c$ Algebra I M4 Lesson 23: Modeling with Quadratic Functions Algebra I M4 Lesson 24: Modeling with Quadratic Functions *Supplemental material is necessary to address solving quadratic inequalities.*
AA.FGR.5.6 Solve systems of quadratic and linear functions to determine points of intersection.	Algebra II M1 Lesson 31: Systems of Equations Algebra II M1 Lesson 32: Graphing Systems of Equations

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.5.7 Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.	Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra I M4 Lesson 12: Completing the Square Algebra I M4 Lesson 16: Graphing Quadratic Equations from the Vertex Form, $y = a(x - h)^2 + k$ Algebra I M4 Lesson 23: Modeling with Quadratic Functions Algebra I M4 Lesson 24: Modeling with Quadratic Functions Algebra I M5 Topic A: Elements of Modeling Algebra I M5 Lesson 4: Modeling a Context from a Graph Algebra I M5 Lesson 5: Modeling from a Sequence Algebra I M5 Lesson 6: Modeling a Context from Data Algebra I M5 Lesson 8: Modeling a Context from a Verbal Description Algebra II M1 Lesson 1: Successive Differences in Polynomials
AA.FGR.5.8 Identify the number of zeros that exist for any polynomial based upon the greatest degree of the polynomial and the end behavior of the polynomial by observing the sign of the leading coefficient.	Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.5.9 Identify zeros of polynomial functions using technology or pre-factored polynomials and use the zeros to construct a graph of the function defined by the polynomial function. Analyze identify key features of these polynomial functions.	Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 15: Structure in Graphs of Polynomial Functions Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm Algebra II M1 Lesson 40: Obstacles Resolved—A Surprising Result
AA.FGR.5.10 Use the structure of an expression to factor polynomials, including the sum of cubes, the difference of cubes, and higher-order polynomials that may be expressed as a quadratic within a quadratic.	Algebra I M4 Lesson 9: Graphing Quadratic Functions from Factored Form, $f(x) = a(x - m)(x - n)$ Algebra II M1 Lesson 2: The Multiplication of Polynomials Algebra II M1 Lesson 3: The Division of Polynomials Algebra II M1 Lesson 6: Dividing by $x - a$ and by $x + a$ 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 13: Mastering Factoring Algebra II M1 Lesson 14: Graphing Factored Polynomials Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm
AA.FGR.5.11 Using all the zeros of a polynomial function, list all the factors and multiply to write a multiple of the polynomial function in standard form.	Algebra II M1 Lesson 11: The Special Role of Zero in Factoring Algebra II M1 Lesson 38: Complex Numbers as Solutions to Equations Algebra II M1 Lesson 39: Factoring Extended to the Complex Realm

Patterning & Algebraic Reasoning—linear algebra and matrices

AA.PAR.6 Represent data with matrices, perform mathematical operations, and solve systems of linear equations leading to real-world linear programming applications.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.PAR.6.1 Use matrices to represent data, and perform mathematical operations with matrices and scalars, demonstrating that some properties of real numbers hold for matrices, but that others do not.	Precalculus and Advanced Topics M1 Lesson 22: Modeling Video Game Motion with Matrices Precalculus and Advanced Topics M1 Lesson 23: Modeling Video Game Motion with Matrices Precalculus and Advanced Topics M1 Lesson 24: Matrix Notation Encompasses New Transformations! Precalculus and Advanced Topics M1 Lesson 25: Matrix Multiplication and Addition Precalculus and Advanced Topics M2 Topic A: Networks and Matrices Precalculus and Advanced Topics M2 Topic B: Linear Transformations of Planes and Space Precalculus and Advanced Topics M2 Topic E: First-Person Video Games—Projection Matrices
AA.PAR.6.2 Rewrite a system of linear equations using a matrix representation.	Precalculus and Advanced Topics M2 Topic C: Systems of Linear Equations
AA.PAR.6.3 Use the inverse of an invertible matrix to solve systems of linear equations.	Precalculus and Advanced Topics M2 Topic C: Systems of Linear Equations
AA.PAR.6.4 Utilize linear programming to represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret data points as solutions or non-solutions under the established constraints in real-world problems.	Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities *Supplemental material is necessary to fully address this standard.*

Geometric & Spatial Reasoning—trigonometry and the unit circle

AA.GSR.7 Develop an introductory understanding of the unit circle; solve trigonometric equations using the unit circle.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.GSR.7.1 Define the three basic trigonometric ratios in terms of x, y, and r using the unit circle centered at the origin of the coordinate plane.	Algebra II M2 Lesson 1: Ferris Wheels—Tracking the Height of a Passenger Car Algebra II M2 Lesson 2: The Height and Co-Height Functions of a Ferris Wheel Algebra II M2 Lesson 3: The Motion of the Moon, Sun, and Stars—Motivating Mathematics Algebra II M2 Lesson 4: From Circle-ometry to Trigonometry Algebra II M2 Lesson 5: Extending the Domain of Sine and Cosine to All Real Numbers
AA.GSR.7.2 Apply understanding of the angle measures and coordinates of the unit circle to solve practical, real-life problems involving trigonometric equations.	Precalculus and Advanced Topics M4 Lesson 12: Inverse Trigonometric Functions Precalculus and Advanced Topics M4 Lesson 13: Modeling with Inverse Trigonometric Functions Precalculus and Advanced Topics M4 Lesson 14: Modeling with Inverse Trigonometric Functions

Functional & Graphical Reasoning—rational functions

AA.FGR.8 Analyze the behaviors of rational functions to model applicable, mathematical problems.

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.8.1 Rewrite simple rational expressions in equivalent forms.	Algebra II M1 Lesson 4: Comparing Methods—Long Division, Again? 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

Georgia's K–12 Mathematics Standards	Aligned Components of *Eureka Math*
AA.FGR.8.2 Add, subtract, multiply and divide rational expressions, including problems in context and express rational expressions in irreducible form.	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
AA.FGR.8.3 Graph rational functions, identifying key characteristics.	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 Precalculus and Advanced Topics M3 Lesson 15: Transforming Rational Functions
AA.FGR.8.4 Solve simple rational equations in one variable, and give examples showing how extraneous solutions may arise.	Algebra II M1 Lesson 26: Solving Rational Equations Algebra II M1 Lesson 27: Word Problems Leading to Rational Equations