Georgia Tutorials are designed specifically for the Georgia Standards of Excellence and the Georgia Performance Standards to prepare students for the Georgia Milestones.

Math Tutorials offer targeted instruction, practice and review designed to develop computational fluency, deepen conceptual understanding, and apply mathematical practices. They automatically identify and address learning gaps down to elementary-level content, using adaptive remediation to bring students to grade-level no matter where they start. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing the ability to apply their knowledge in abstract and real world scenarios, students build the depth of knowledge and higher order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible to students through focused content, modeled logic and process, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

Unit 1: Exponential Functions

- **EXPONENTIAL FUNCTIONS**
  - AA.FGR.3.2: Analyze, graph, and compare exponential and logarithmic functions.
  - 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.
- **EXPONENTIAL GROWTH AND DECAY**
  - 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.

Unit 2: Logarithmic Functions

- **LOGARITHMIC FUNCTIONS**
  - AA.FGR.3.2: Analyze, graph, and compare exponential and logarithmic functions.
  - AA.FGR.3.7: Create, interpret, and solve logarithmic equations in two or more variables to represent relationships between quantities.
  - 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.

Copyright© Edmentum Inc. All Rights Reserved.

- **EVALUATING LOGARITHMIC EXPRESSIONS**
  - 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.

Unit 3: Solving Exponential and Logarithmic Equations

- **LAWS OF EXPONENTS**
  - AA.FGR.4.1: Rewrite radical expressions as expressions with rational exponents. Extend the properties of integer exponents to rational exponents.
- **SOLVING EXPONENTIAL EQUATIONS**
  - 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.
  - AA.FGR.3.2: Analyze, graph, and compare exponential and logarithmic functions.
  - AA.FGR.3.4: Create exponential equations and use logarithms to solve mathematical, applicable problems for which only one variable is unknown.
- **SOLVING LOGARITHMIC EQUATIONS**
  - 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.
  - AA.FGR.3.5: Create and interpret logarithmic equations in one variable and use them to solve problems.

Unit 4: Solving Quadratic Equations

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**
  - AA.FGR.5.5: Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.
  - AA.FGR.5.4: Use the structure of an expression to factor quadratics.
  - AA.FGR.5.7: Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.
- **COMPLETING THE SQUARE**
  - AA.FGR.5.5: Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.
- **QUADRATIC FORMULA**
  - AA.FGR.5.7: Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.
  - AA.FGR.5.5: Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.

Unit 5: Quadratic Functions

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**

Copyright© Edmentum Inc. All Rights Reserved.

- AA.FGR.5.1: Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.

- **COMPLEX NUMBERS AND QUADRATIC FUNCTIONS**
  - AA.FGR.5.5: Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.
  - AA.FGR.5.3: Use the relation = 1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
- **REPRESENTATIONS OF QUADRATIC FUNCTIONS**
  - AA.FGR.5.1: Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.
  - AA.FGR.5.5: Write and solve quadratic equations and inequalities with real coefficients and use the solution to explain a mathematical, applicable situation.

Unit 6: Factoring Polynomials I

- **GRAPHS OF POLYNOMIAL FUNCTIONS**
  - 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.
  - 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.
- **FACTORING SPECIAL CASES**
  - 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.
  - AA.FGR.5.4: Use the structure of an expression to factor quadratics.

Unit 7: Factoring Polynomials II

- **FACTORING CUBIC POLYNOMIALS**
  - 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.
- **FACTORING HIGHER-ORDER 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.
  - 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

Copyright© Edmentum Inc. All Rights Reserved.

quadratic.

Unit 8: Complex Numbers and Polynomial Identities

- **COMPLEX NUMBERS**
  - AA.FGR.5.3: Use the relation = 1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
  - AA.FGR.5.2: Define complex numbers such that = 1 and show that every complex number has the form + where and are real numbers and that the complex conjugate is .
- **POLYNOMIAL IDENTITIES**
  - 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.
- **POLYNOMIAL IDENTITIES AND COMPLEX NUMBERS**
  - 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.
  - AA.FGR.5.2: Define complex numbers such that = 1 and show that every complex number has the form + where and are real numbers and that the complex conjugate is .
  - AA.FGR.5.2: Define complex numbers such that = 1 and show that every complex number has the form + where and are real numbers and that the complex conjugate is .
  - 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.
  - AA.FGR.5.2: Define complex numbers such that = 1 and show that every complex number has the form + where and are real numbers and that the complex conjugate is .
  - AA.FGR.5.2: Define complex numbers such that = 1 and show that every complex number has the form + where and are real numbers and that the complex conjugate is .

Unit 9: Square Root Equations and Functions

- **ANALYZING GRAPHS OF SQUARE ROOT FUNCTIONS**
  - AA.FGR.4.3: Analyze and graph radical functions.
  - 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.
  - AA.FGR.4.2: Solve radical equations in one variable, and give examples showing how extraneous solutions may arise.
- **SOLVING SQUARE ROOT EQUATIONS**
  - 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.

Copyright© Edmentum Inc. All Rights Reserved.

- AA.FGR.4.2: Solve radical equations in one variable, and give examples showing how extraneous solutions may arise.
- AA.FGR.4.3: Analyze and graph radical functions.
- AA.FGR.4.5: Create, interpret, and solve radical equations in two or more variables to represent relationships between quantities.

Unit 10: Rational Expressions and Equations

- **OPERATIONS WITH RATIONAL EXPRESSIONS**
  - AA.FGR.8.1: Rewrite simple rational expressions in equivalent forms.
  - AA.FGR.8.2: Add, subtract, multiply and divide rational expressions, including problems in context and express rational expressions in irreducible form.
- **SOLVING RATIONAL EQUATIONS**
  - AA.FGR.8.4: Solve simple rational equations in one variable, and give examples showing how extraneous solutions may arise.

Unit 11: Rational Functions

- **ANALYZING GRAPHS OF RATIONAL FUNCTIONS**
  - AA.FGR.8.3: Graph rational functions, identifying key characteristics.
- **MODELING SITUATIONS WITH RATIONAL FUNCTIONS**
  - AA.FGR.8.3: Graph rational functions, identifying key characteristics.

Unit 12: Transforming Functions

- **PARENT FUNCTIONS**
  - AA.FGR.3.2: Analyze, graph, and compare exponential and logarithmic functions.
- **TRANSFORMATIONS OF PARENT FUNCTIONS**
  - AA.FGR.8.3: Graph rational functions, identifying key characteristics.
- **MULTIPLE TRANSFORMATIONS OF PARENT FUNCTIONS**
  - AA.FGR.8.3: Graph rational functions, identifying key characteristics.
  - AA.FGR.5.1: Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.
  - AA.FGR.3.2: Analyze, graph, and compare exponential and logarithmic functions.

Unit 13: Applying Functions

- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - AA.FGR.5.1: Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.
  - AA.FGR.5.7: Create and analyze quadratic equations to represent relationships between quantities as a model for contextual situations.

Copyright© Edmentum Inc. All Rights Reserved.

- 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.

- **SCATTERPLOTS AND MODELING**
  - AA.FGR.5.1: Graph and analyze quadratic functions in contextual situations and include analysis of data sets with regressions.

Unit 14: Systems of Equations

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: MATRICES**
  - AA.PAR.6.2: Rewrite a system of linear equations using a matrix representation.
  - 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.
- **SYSTEMS OF NONLINEAR EQUATIONS**
  - AA.FGR.5.6: Solve systems of quadratic and linear functions to determine points of intersection.

Unit 15: The Unit Circle

- **RADIANS AND THE UNIT CIRCLE**
  - AA.GSR.7.1: Define the three basic trigonometric ratios in terms of , , and using the unit circle centered at the origin of the coordinate plane.

Unit 16: Statistical Design and Analysis

- **ANALYZING STATISTICAL SAMPLES**
  - 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.
  - AA.DSR.2.6: Model sample-to-sample variability in sampling distributions of a statistic using simulations taken from a given population.
  - 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.
  - AA.DSR.2.7: Given a margin of error, develop and compare confidence intervals of different models to make conclusions about reliability.
- **EXPERIMENTAL AND OBSERVATIONAL DESIGN**
  - 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.
  - 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

Copyright© Edmentum Inc. All Rights Reserved.

investigative question. Implement strategies for organizing and preparing big data sets.

- **CONCLUSIONS IN DATA**
  - AA.DSR.2.8: Summarize and evaluate reports based on data for appropriateness of study design, analysis methods, and statistical measures used.

Unit 17: Statistics

- **USING STATISTICAL MEASURES TO COMPARE DATA SETS**
  - AA.DSR.2.8: Summarize and evaluate reports based on data for appropriateness of study design, analysis methods, and statistical measures used.
- **NORMAL DISTRIBUTION**
  - AA.DSR.2.4: Calculate and interpret -scores as a measure of relative standing and as a method of standardizing units.
  - AA.DSR.2.5: Given a normally distributed population, estimate percentages using the Empirical Rule, -scores, and technology.
  - AA.DSR.2.4: Calculate and interpret -scores as a measure of relative standing and as a method of standardizing units.
  - AA.DSR.2.7: Given a margin of error, develop and compare confidence intervals of different models to make conclusions about reliability.

Copyright© Edmentum Inc. All Rights Reserved.