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: Real Number System

- **SIMPLIFYING SQUARE ROOTS**
  - A.NR.5.1: Rewrite algebraic and numeric expressions involving radicals.
- **OPERATIONS ON RATIONAL AND IRRATIONAL NUMBERS**
  - A.NR.5.2: Using numerical reasoning, show and explain that the sum or product of rational numbers is rational, the sum of a rational number and an irrational number is irrational, and the product of a nonzero rational number and an irrational number is irrational.

Unit 2: Functions

- **DOMAIN AND RANGE**
  - A.FGR.2.3: Relate the domain and range of a linear function to its graph and, where applicable, to the quantitative relationship it describes. Use formal interval and set notation to describe the domain and range of linear functions.
  - A.FGR.7.4: Relate the domain and range of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes.
- **EVALUATING FUNCTIONS**

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- A.FGR.7.1: Use function notation to build and evaluate quadratic functions for inputs in their domains and interpret statements that use function notation in terms of a given framework.
- A.FGR.2.4: Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.

Unit 3: Slope and Linear Functions

- **SLOPE**
  - A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.
  - A.DSR.10.4: Interpret the slope (predicted rate of change) and the intercept (constant term) of a linear model based on the investigation of the data.
  - A.GSR.3.2: Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.
- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**
  - A.FGR.2.2: Construct and interpret the graph of a linear function that models real-life phenomena and represent key characteristics of the graph using formal notation.
  - A.FGR.2.4: Use function notation to build and evaluate linear functions for inputs in their domains and interpret statements that use function notation in terms of a mathematical framework.

Unit 4: Linear Equations

- **GRAPHING AND MANIPULATING Y = MX + B**
  - A.DSR.10.4: Interpret the slope (predicted rate of change) and the intercept (constant term) of a linear model based on the investigation of the data.
  - A.GSR.3.2: Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.
- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.
  - A.GSR.3.2: Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.
- **POINT-SLOPE FORM OF A LINEAR EQUATION**
  - A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Unit 5: Coordinate Geometry

- **LENGTH AND THE DISTANCE FORMULA**
  - A.GSR.3.2: Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.

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- **MIDPOINT FORMULA ON THE COORDINATE PLANE**
  - A.GSR.3.2: Apply the distance formula, midpoint formula, and slope of line segments to solve real-world problems.
- **PERIMETER ON THE COORDINATE PLANE**
  - A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.
- **AREA ON THE COORDINATE PLANE**
  - A.GSR.3.1: Solve real-life problems involving slope, parallel lines, perpendicular lines, area, and perimeter.

Unit 6: Linear Inequalities

- **GRAPHS OF LINEAR INEQUALITIES**
  - A.PAR.4.1: Create and solve linear inequalities in two variables to represent relationships between quantities including mathematically applicable situations; graph inequalities on coordinate axes with labels and scales.
  - A.PAR.4.2: Represent constraints of linear inequalities and interpret data points as possible or not possible.
- **SOLVING SYSTEMS OF LINEAR INEQUALITIES**
  - A.PAR.4.3: Solve systems of linear inequalities by graphing, including systems representing a mathematically applicable situation.

Unit 7: Exponential Functions

- **EXPONENTIAL FUNCTIONS**
  - A.PAR.8.3: Create exponential equations in two variables to represent relationships between quantities, including in mathematically applicable situations; graph equations on coordinate axes with labels and scales.
  - A.FGR.9.2: Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.
  - A.FGR.9.1: Use function notation to build and evaluate exponential functions for inputs in their domains and interpret statements that use function notation in terms of a context.
  - A.PAR.8.1: Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.
  - A.PAR.8.2: Create exponential equations in one variable and use them to solve problems, including mathematically applicable situations.
- **EXPONENTIAL GROWTH AND DECAY**
  - A.PAR.8.3: Create exponential equations in two variables to represent relationships between quantities, including in mathematically applicable situations; graph equations on coordinate axes with labels and scales.

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- A.FGR.9.2: Graph and analyze the key characteristics of simple exponential functions based on mathematically applicable situations.
- A.FGR.9.1: Use function notation to build and evaluate exponential functions for inputs in their domains and interpret statements that use function notation in terms of a context.
- A.PAR.8.1: Interpret exponential expressions and parts of an exponential expression that represent a quantity in terms of its framework.

Unit 8: Sequences

- **SEQUENCES**
  - A.FGR.9.4: Use mathematically applicable situations algebraically and graphically to build and interpret geometric sequences as functions whose domain is a subset of the integers.
  - A.FGR.2.1: Use mathematically applicable situations algebraically and graphically to build and interpret arithmetic sequences as functions whose domain is a subset of the integers.
- **ARITHMETIC AND GEOMETRIC SEQUENCES**
  - A.FGR.2.1: Use mathematically applicable situations algebraically and graphically to build and interpret arithmetic sequences as functions whose domain is a subset of the integers.
  - A.FGR.9.4: Use mathematically applicable situations algebraically and graphically to build and interpret geometric sequences as functions whose domain is a subset of the integers.

Unit 9: Factoring

- **FACTORING QUADRATIC TRINOMIALS**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.
  - A.PAR.6.1: Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.
- **FACTORING SPECIAL CASES**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.

Unit 10: Graphs of Quadratic Functions

- **QUADRATIC FUNCTIONS**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.5: Rewrite a quadratic function representing a mathematically applicable situation to reveal the maximum or minimum value of the function it defines. Explain what the value describes in

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context.

- A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.

- **ANALYZING GRAPHS OF QUADRATIC FUNCTIONS**
  - A.FGR.7.6: Create quadratic functions in two variables to represent relationships between quantities; graph quadratic functions on the coordinate axes with labels and scales.
  - A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.
  - A.PAR.6.4: Represent constraints by quadratic equations and interpret data points as possible or not possible in a modeling framework.
  - A.FGR.7.4: Relate the domain and range of a quadratic function to its graph and, where applicable, to the quantitative relationship it describes.
- **REPRESENTATIONS OF QUADRATIC FUNCTIONS**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.5: Rewrite a quadratic function representing a mathematically applicable situation to reveal the maximum or minimum value of the function it defines. Explain what the value describes in context.
  - A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.
  - A.FGR.7.6: Create quadratic functions in two variables to represent relationships between quantities; graph quadratic functions on the coordinate axes with labels and scales.
  - A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.
  - A.PAR.6.1: Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.
  - A.FGR.7.1: Use function notation to build and evaluate quadratic functions for inputs in their domains and interpret statements that use function notation in terms of a given framework.

Unit 11: Solving Quadratic Equations

- **SOLVING QUADRATIC EQUATIONS BY FACTORING**
  - A.PAR.6.1: Interpret quadratic expressions and parts of a quadratic expression that represent a quantity in terms of its context.
  - A.PAR.6.4: Represent constraints by quadratic equations and interpret data points as possible or not possible in a modeling framework.
  - A.PAR.6.3: Create and solve quadratic equations in one variable and explain the solution in the framework of applicable phenomena.
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.

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- A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.
- A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.

- **COMPLETING THE SQUARE**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.5: Rewrite a quadratic function representing a mathematically applicable situation to reveal the maximum or minimum value of the function it defines. Explain what the value describes in context.
  - A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.
  - A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.
- **QUADRATIC FORMULA**
  - A.PAR.6.2: Fluently choose and produce an equivalent form of a quadratic expression to reveal and explain properties of the quantity represented by the expression.
  - A.FGR.7.8: Write a function defined by a quadratic expression in different but equivalent forms to reveal and explain different properties of the function.
  - A.FGR.7.3: Graph and analyze the key characteristics of quadratic functions.
  - A.PAR.6.4: Represent constraints by quadratic equations and interpret data points as possible or not possible in a modeling framework.

Unit 12: Parent Functions

- **LINEAR AND EXPONENTIAL PARENT FUNCTIONS**
  - A.FGR.2.5: Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).
- **QUADRATIC PARENT FUNCTION**
  - A.FGR.2.5: Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).

Unit 13: Transformations of Parent Functions

- **TRANSFORMATIONS OF THE LINEAR AND EXPONENTIAL PARENT FUNCTIONS**
  - A.FGR.9.3: Identify the effect on the graph generated by an exponential function when replacing () with () + , and (), for specific values of (both positive and negative); find the value of given the graphs.
- **TRANSFORMATIONS OF THE QUADRATIC PARENT FUNCTION**

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- A.FGR.7.2: Identify the effect on the graph generated by a quadratic function when replacing () with () + , (), (), and (+) for specific values of (both positive and negative); find the value of given the graphs.

Unit 14: Linear and Nonlinear Functions

- **LINEAR VERSUS NONLINEAR FUNCTIONS**
  - A.FGR.2.5: Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).
- **MULTIPLE REPRESENTATIONS OF FUNCTIONS**
  - A.FGR.7.9: Compare characteristics of two functions each represented in a different way.
  - A.FGR.9.5: Compare characteristics of two functions each represented in a different way.
- **ABSOLUTE VALUE FUNCTIONS**
  - A.FGR.2.5: Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).
- **ANALYZING GRAPHS OF SQUARE ROOT FUNCTIONS**
  - A.FGR.2.5: Analyze the difference between linear functions and nonlinear functions by informally analyzing the graphs of various parent functions (linear, quadratic, exponential, absolute value, square root, and cube root parent curves).

Unit 15: Statistics

- **DATA ANALYSIS**
  - A.DSR.10.1: Use statistics appropriate to the shape of the data distribution to compare and represent center (median and mean) and variability (interquartile range, standard deviation) of two or more distributions by hand and using technology.
  - A.DSR.10.2: Interpret differences in shape, center, and variability of the distributions based on the investigation, accounting for possible effects of extreme data points (outliers).
- **SCATTERPLOTS**
  - A.DSR.10.3: Represent data on two quantitative variables on a scatter plot and describe how the variables are related.
  - A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.
  - A.DSR.10.7: Distinguish between correlation and causation.
  - A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

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- A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.
- A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.
- A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.

- **SCATTERPLOTS AND MODELING**
  - A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.
  - A.DSR.10.6: Decide which type of function is most appropriate by observing graphed data.
  - A.DSR.10.3: Represent data on two quantitative variables on a scatter plot and describe how the variables are related.
  - A.DSR.10.5: Calculate the line of best fit and interpret the correlation coefficient, , of a linear fit using technology. Use to describe the strength of the goodness of fit of the regression. Use the linear function to make predictions and assess how reasonable the prediction is in context.
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