Tennessee Tutorials are designed specifically for the Tennessee Academic Standards to prepare students for the Tennessee Comprehensive Assessment Program (TCAP) and the TNReady assessments.

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.

## 1. ONE-VARIABLE EQUATIONS

- **ONE-STEP EQUATIONS AND INEQUALITIES**
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.A.1** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*

- **MULTI-STEP EQUATIONS AND INEQUALITIES**
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.A.1** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*

## 2. EXPRESSIONS, EQUATIONS, AND INEQUALITIES

- **LITERAL EQUATIONS**
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*
  - **M1.A.REI.A.1** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **M1.A.CED.A.4** *Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.*

- **MONITORING PRECISION AND ACCURACY**
  - **M1.N.Q.A.1** *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.*
  - **M1.N.Q.A.2** *Identify, interpret, and justify appropriate quantities for the purpose of descriptive modeling.*
  - **M1.N.Q.A.3** *Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*

## 3. WRITING EQUATIONS AND INEQUALITIES

- **FORMULATING AND SOLVING EQUATIONS FROM WORD PROBLEMS**
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*
  - **M1.A.CED.A.3** *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.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*
  - **M1.F.LE.A.1.b** *Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
  - **M1.F.IF.B.3** *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.*
  - **M1.A.SSE.A.1.a** *Interpret parts of an expression, such as terms, factors, and coefficients.*

- **FORMULATING AND SOLVING INEQUALITIES FROM WORD PROBLEMS**
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.A.1** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*
  - **M1.A.SSE.A.1.a** *Interpret parts of an expression, such as terms, factors, and coefficients.*

## 4. FUNCTIONS

- **FUNCTIONS AND RELATIONS**
  - **M1.F.IF.A.2** *Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.3** *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.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*

- **DOMAIN AND RANGE**
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.4** *Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.*

- **EVALUATING FUNCTIONS**
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.A.2** *Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*

## 5. GRAPHING LINEAR EQUATIONS AND INEQUALITIES

- **GRAPHING AND ANALYZING LINEAR FUNCTIONS**
  - **M1.F.IF.A.1** *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).*

- **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
- **M1.F.IF.B.4** *Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.*
- **M1.F.IF.B.3** *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.*
- **M1.F.IF.C.6.a** *Graph linear and quadratic functions and show intercepts, maxima, and minima.*

- **GRAPHING AND MANIPULATING Y = MX + B**
  - **M1.A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.*
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.5** *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.*
  - **M1.F.IF.C.6.a** *Graph linear and quadratic functions and show intercepts, maxima, and minima.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
  - **M1.S.ID.C.5** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*
  - **M1.F.IF.B.3** *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.*
  - **M1.F.LE.A.1.b** *Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*
  - **M1.F.LE.B.4** *Interpret the parameters in a linear or exponential function in terms of a context.*

- **GRAPHS OF LINEAR INEQUALITIES**
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.C.5** *Graph the solutions to 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 to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.*
  - **M1.A.REI.A.1** *Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.*

## 6. LINEAR EQUATIONS

- **SLOPE**
  - **M1.F.IF.B.5** *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.*
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.3** *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.*

- **SLOPE-INTERCEPT FORM OF A LINEAR EQUATION**
  - **M1.S.ID.C.5** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.C.6.a** *Graph linear and quadratic functions and show intercepts, maxima, and minima.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
  - **M1.A.REI.C.3** *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).*

- **M1.A.CED.A.3** *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.*
- **M1.F.IF.B.5** *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.*

### POINT-SLOPE FORM OF A LINEAR EQUATION

- **M1.F.IF.A.1** *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).*
- **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
- **M1.A.REI.C.3** *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).*
- **M1.F.IF.C.6.a** *Graph linear and quadratic functions and show intercepts, maxima, and minima.*
- **M1.A.CED.A.3** *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.*

## 7. POINTS, LINES, AND ANGLES 1

### POINTS, RAYS, LINE SEGMENTS, LINES, AND FIGURES

- **M1.G.CO.A.1** *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.*

### PARALLEL AND PERPENDICULAR LINES

- **M1.G.CO.A.1** *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.*

## 8. POINTS, LINES, AND ANGLES 2

### PARALLEL LINES AND ANGLE RELATIONSHIPS

- **M1.G.CO.A.1** *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.*
- **M1.G.CO.C.9** *Prove theorems about lines and angles.*

### PERPENDICULAR BISECTOR AND ANGLE BISECTOR THEOREMS

- **M1.G.CO.A.1** *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.*
- **M1.G.CO.C.9** *Prove theorems about lines and angles.*
- **M1.G.CO.C.10** *Prove theorems about triangles.*

## 9. COORDINATE GEOMETRY

### LENGTH AND THE DISTANCE FORMULA

- **M1.G.CO.A.1** *Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, plane, distance along a line, and distance around a circular arc.*

### CONJECTURES IN COORDINATE GEOMETRY

- **M1.G.CO.A.2** *Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).*
- **M1.G.CO.C.10** *Prove theorems about triangles.*

## 10. TRANSFORMATIONS AND CONGRUENCE 1

- **DILATIONS, TRANSLATIONS, ROTATIONS, AND REFLECTIONS**
  - **M1.G.CO.A.2** *Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).*
  - **M1.G.CO.B.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.*
  - **M1.G.CO.A.5** *Given a geometric figure and a rigid motion, draw the image of the figure in multiple ways, including technology. Specify a sequence of rigid motions that will carry a given figure onto another.*
  - **M1.G.CO.A.3** *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry the shape onto itself.*
  - **M1.G.CO.A.4** *Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.*

- **TRANSFORMATIONS ON THE COORDINATE PLANE**
  - **M1.G.CO.A.2** *Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).*
  - **M1.G.CO.A.3** *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry the shape onto itself.*
  - **M1.G.CO.B.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.*
  - **M1.G.CO.A.4** *Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.*
  - **M1.G.CO.A.5** *Given a geometric figure and a rigid motion, draw the image of the figure in multiple ways, including technology. Specify a sequence of rigid motions that will carry a given figure onto another.*

## 11. TRANSFORMATIONS AND CONGRUENCE 2

- **TRIANGLES AND CONGRUENCE TRANSFORMATIONS**
  - **M1.G.CO.B.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.*
  - **M1.G.CO.B.7** *Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.*
  - **M1.G.CO.B.8** *Explain how the criteria for triangle congruence (ASA, SAS, AAS, and SSS) follow from the definition of congruence in terms of rigid motions.*
  - **M1.G.CO.C.10** *Prove theorems about triangles.*

- **CONGRUENCE OF OTHER POLYGONS**
  - **M1.G.CO.B.6** *Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.*
  - **M1.G.CO.A.2** *Represent transformations in the plane in multiple ways, including technology. Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not (e.g., translation versus horizontal stretch).*
  - **M1.G.CO.A.5** *Given a geometric figure and a rigid motion, draw the image of the figure in multiple ways, including technology. Specify a sequence of rigid motions that will carry a given figure onto another.*
  - **M1.G.CO.A.3** *Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry the shape onto itself.*

## 12. TRIANGLES

- **TRIANGLE ANGLE THEOREMS**
  - **M1.G.CO.C.10** *Prove theorems about triangles.*

- **MEDIANS AND ALTITUDES OF TRIANGLES**
  - **M1.G.CO.C.10** *Prove theorems about triangles.*

## 13. QUADRILATERALS

- **PARALLELOGRAMS AND RECTANGLES**
  - **M1.G.CO.C.11** *Prove theorems about parallelograms.*

- **SQUARES AND RHOMBI**
  - **M1.G.CO.C.11** *Prove theorems about parallelograms.*

## 14. LINEAR SYSTEMS

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GUESS AND CHECK**
  - **M1.A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.*
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.B.2** *Write and solve a system of linear equations in context.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: GRAPHING**
  - **M1.A.CED.A.3** *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.*
  - **M1.A.REI.B.2** *Write and solve a system of linear equations in context.*
  - **M1.A.REI.C.4** *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 approximate solutions using technology.*
  - **M1.A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.*

## 15. SOLVING LINEAR SYSTEMS ALGEBRAICALLY

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: SUBSTITUTION**
  - **M1.A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.*
  - **M1.A.REI.B.2** *Write and solve a system of linear equations in context.*
  - **M1.A.CED.A.3** *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.*

- **SOLVING SYSTEMS OF LINEAR EQUATIONS: ELIMINATION**
  - **M1.A.CED.A.2** *Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.*
  - **M1.A.REI.B.2** *Write and solve a system of linear equations in context.*
  - **M1.A.CED.A.3** *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.*

## 16. WORKING WITH FUNCTIONS

- **LINEAR VERSUS NONLINEAR**

- **M1.F.IF.B.5** *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.*
- **M1.F.LE.A.1.a** *Recognize that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.*
- **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
- **M1.F.IF.B.3** *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.*
- **M1.F.LE.A.1.b** *Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*
- **M1.F.LE.A.1.c** *Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.*
- **M1.F.IF.C.7** *Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).*

- **ABSOLUTE VALUE FUNCTIONS**
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.4** *Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.*
  - **M1.F.IF.B.3** *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.*

## 17. EXPONENTIAL FUNCTIONS, EQUATIONS, AND INEQUALITIES

- **EXPONENTIAL FUNCTIONS**
  - **M1.A.SSE.A.1.a** *Interpret parts of an expression, such as terms, factors, and coefficients.*
  - **M1.A.SSE.A.1.b** *Interpret complicated expressions by viewing one or more of their parts as a single entity.*
  - **M1.F.LE.A.1.a** *Recognize that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.*
  - **M1.F.IF.B.5** *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.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
  - **M1.F.LE.A.3** *Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly.*
  - **M1.F.IF.A.1** *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).*
  - **M1.F.IF.B.3** *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.*
  - **M1.F.IF.B.4** *Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.*
  - **M1.A.CED.A.1** *Create equations and inequalities in one variable and use them to solve problems.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*
  - **M1.F.LE.A.1.c** *Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.*
  - **M1.F.LE.B.4** *Interpret the parameters in a linear or exponential function in terms of a context.*
  - **M1.A.SSE.B.2.a** *Use the properties of exponents to rewrite exponential expressions.*

- **EXPONENTIAL GROWTH AND DECAY**
  - **M1.A.SSE.A.1.a** *Interpret parts of an expression, such as terms, factors, and coefficients.*
  - **M1.A.SSE.A.1.b** *Interpret complicated expressions by viewing one or more of their parts as a single entity.*
  - **M1.F.LE.A.1.a** *Recognize that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.*
  - **M1.F.LE.A.1.c** *Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.*

- **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
- **M1.F.LE.B.4** *Interpret the parameters in a linear or exponential function in terms of a context.*
- **M1.F.LE.A.3** *Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly.*
- **M1.F.LE.A.1.b** *Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*

- **SOLVING EXPONENTIAL INEQUALITIES**
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*
  - **M1.A.CED.A.3** *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.*
  - **M1.A.SSE.A.1.b** *Interpret complicated expressions by viewing one or more of their parts as a single entity.*
  - **M1.F.LE.A.1.c** *Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.*

## 18. SEQUENCES

- **SEQUENCES**
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*
  - **M1.F.BF.A.2** *Write arithmetic and geometric sequences with an explicit formula and use them to model situations.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*

- **ARITHMETIC AND GEOMETRIC SEQUENCES**
  - **M1.F.BF.A.2** *Write arithmetic and geometric sequences with an explicit formula and use them to model situations.*
  - **M1.F.BF.A.1.a** *Determine an explicit expression, a recursive process, or steps for calculation from a context.*
  - **M1.F.LE.A.2** *Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*

## 19. STATISTICS

- **DATA ANALYSIS**
  - **M1.S.ID.A.1** *Represent single or multiple data sets with dot plots, histograms, stem plots (stem and leaf), and box plots.*
  - **M1.S.ID.A.2** *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.*
  - **M1.S.ID.A.3** *Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).*

- **SCATTERPLOTS**
  - **M1.S.ID.B.4.a** *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.*
  - **M1.S.ID.B.4.b** *Fit a linear function for a scatter plot that suggests a linear association.*
  - **M1.S.ID.C.7** *Distinguish between correlation and causation.*
  - **M1.F.IF.B.5** *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.*
  - **M1.S.ID.C.5** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*

- **SCATTERPLOTS AND MODELING**
  - **M1.S.ID.B.4.a** *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.*
  - **M1.S.ID.B.4.b** *Fit a linear function for a scatter plot that suggests a linear association.*
  - **M1.S.ID.C.6** *Compute (using technology) and interpret the correlation coefficient of a linear fit.*

- **M1.S.ID.C.5** *Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*
- **M1.F.LE.A.1.a** *Recognize that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.*
- **M1.F.LE.A.1.c** *Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.*