Honors Algebra 1

Semester A Summary:

In this course, students will learn, practice, and apply skills and strategies that will help them grow into strong mathematical thinkers. The course presents math as a complete subject to be studied, not merely sets of rules and formulas to be followed. Arriving at solutions is important, as are precision and vocabulary, but instruction does not center on procedural math only. Instead, instruction encourages depth of understanding, connections within and outside courses, flexibility of approaches, and usage of various tools. Daily instruction supports student learning of core algebraic concepts and development of procedural fluency regarding rational and irrational numbers; structures of expressions; one-variable equations and inequalities; quadratic equations; two-variable equations and inequalities; functions and their graphs; and linear and exponential sequences. Each instructional learning object is aligned to and framed by one of eight Standards for Mathematical Practice. Students are encouraged to use visual representations of their thinking to bridge their understanding between the concrete and abstract, allowing patterns and geometric principles to come to life. In peer model videos throughout the course, the learner's peers demonstrate apply targeted mathematical skills, often using real-world examples. Instruction in 21st century skills further illustrates connections between mathematical concepts and real-world situations to support students' development of the abilities, knowledge, and expertise they need to thrive in today's world. Mathematical discussion prompts encourage students to revise misconceptions, uncover nuances in application, make connections to prior knowledge, identify patterns, and engage with vocabulary. Students are encouraged to share their thinking, justify their own solutions, read critically, and constructively critique the reasoning of others. The course is designed to support a growth mindset regarding math and encourages students to engage in productive struggle; instructional materials implicitly and explicitly remind students that mistakes are opportunities for learning and acquiring new skills. Together the course elements ensure the student grows as a mathematical thinker and develops the tools necessary for success at work and in life.

Semester A Outline

1. **Honors Algebra 1 A Course Overview**
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2. **Rational & Irrational Numbers**
    1. Rational & Irrational Numbers Introduction
    2. Sums & Products of Rational Numbers
        - In this section, you will prove that the sum of any two rational numbers is always rational.
        - In this section, you will prove that the product of any two rational numbers is rational.
    3. Sums & Products of Rational & Irrational Numbers
        - In this section, you will prove that the sum of any rational number and any irrational number is irrational.
        - In this section, you will prove that the product of any nonzero rational

number and any irrational number is irrational.

4. Rational Exponents
    - In this section, you will relate the meaning of a rational exponent to the frequency with which a number is used as a factor.
    - In this section, you will connect the meaning of a rational exponent to the meaning of a root.
5. Properties of Rational Exponents
    - In this section, you will use the properties of exponents to generate equivalent expressions involving rational exponents.
    - In this section, you will solve equations involving rational exponents.
6. Radicals & Rational Exponents
    - In this section, you will simplify square roots of whole numbers and monomial algebraic expressions.
    - In this section, you will use the properties of exponents to generate equivalent expressions involving radicals and rational exponents.
    - In this section, you will use the properties of exponents to determine whether equations involving radicals and rational exponents are true or false.
7. Rational & Irrational Numbers Apply
8. Rational & Irrational Numbers Review
9. Rational & Irrational Numbers Unit Test

3. **Structures of Expressions**
    1. Structures of Expressions Introduction
    2. Parts of Algebraic Expressions
        - In this section, you will interpret the parts of an algebraic expression in terms of their context.
        - In this section, you will use context and grouping symbols to interpret parts of an expression as a single entity.
        - In this section, you will translate between verbal quantitative situations and algebraic expressions and equations.
    3. The Commutative Property
        - In this section, you will use the Commutative Property to rewrite algebraic expressions.
        - In this section, you will use the Commutative Property to prove algebraic expressions are equivalent.
    4. The Associative Property
        - In this section, you will use the Associative Property to rewrite algebraic expressions.
        - In this section, you will use the Associative Property to prove algebraic expressions are equivalent.
    5. The Distributive Property
        - In this section, you will use the Distributive Property to rewrite algebraic expressions.
        - In this section, you will use the Distributive Property to prove algebraic expressions to be equivalent.
        - In this section, you will represent algebraic expressions in practical situations with the Distributive Property, in a variety of representations.
    6. Adding & Subtracting Polynomials
        - In this section, you will add polynomial expressions.
        - In this section, you will show that polynomials form a closed system under addition and subtraction.
    7. Multiplying Polynomials

- In this section, you will multiply polynomial expressions.
- In this section, you will show how multiplying polynomials forms a closed system.

8. Dividing Polynomials
    - In this section, you will divide a first-degree polynomial by a first-degree polynomial.
    - In this section, you will divide a second-degree polynomial by a first-degree polynomial.
    - In this section, you will divide a second-degree polynomial by a second-degree polynomial.
9. Structures of Expressions Apply
10. Structures of Expressions Review
11. Structures of Expressions Unit Test

4. **1-Variable Equations & Inequalities**
    1. 1-Variable Equations & Inequalities Introduction
    2. True or False Statements
        - In this section, you will determine the truth value of equations and inequalities.
        - In this section, you will determine whether the given variable value(s) make equations and inequalities true or false.
    3. Solution Sets of Equations & Inequalities
        - In this section, you will use set notation to express the value(s) that make equations true.
        - In this section, you will use set notation to express the value(s) that make inequalities true.
    4. Solving Linear Equations
        - In this section, you will use properties of equality to justify each step in the process of solving linear equations.
        - In this section, you will identify linear equations that have the same solution set.
    5. Solving Linear Inequalities
        - In this section, use a process of justifying each step with the properties of inequality to solve linear inequalities.
        - In this lesson, you will graph solution sets for linear inequalities on a number line.
    6. Multiple Equations or Inequalities
        - In this section, you will determine solution sets for two or more equations or inequalities joined by "and" or "or."
        - In this section, you will graph solution sets on a number line for two or more equations or inequalities joined by *and* or *or*.
    7. Variable Expressions in Denominators
        - In this section, you will rewrite equations containing variables in denominators as two equations joined by "and."
        - In this section, you will solve equations that include a variable in the denominator.
    8. Rearranging Formulas
        - In this section, you will use the properties of equality to rearrange formulas to highlight different quantities of interest.
        - In this section, you will use units to help justify that rearrangements of formulas make sense.
    9. Creating One-Variable Equations & Inequalities

- In this section, you will use equations created with one variable to solve problems.
- In this section, you will represent constraints of a contextual situation by interpreting solutions of equations and inequalities as viable or nonviable.

10. 1-Variable Equations & Inequalities Prompt
11. 1-Variable Equations & Inequalities Discussion
12. 1-Variable Equations & Inequalities Apply
13. 1-Variable Equations & Inequalities Review
14. 1-Variable Equations & Inequalities Unit Test

5. **Quadratic Equations**
    1. Quadratic Equations Introduction
    2. Solution Sets of Quadratic Equations
        - In this section, you will determine whether given variable values make a quadratic equation true or false.
        - In this section, you will show that a quadratic equation can have zero, one, or two solutions.
    3. Solving Simple Quadratic Equations
        - In this section, you will solve quadratic equations of the form $x^2 = number$ by inspection.
        - In this section, you will solve quadratic equations using square roots.
    4. The Zero Product Property
        - In this section, you will explain how the Zero Product Property can be used to find solution sets of quadratic equations.
        - In this section, you will use the Zero Product Property to solve quadratic equations that are in factored form.
    5. Solving Quadratic Equations Using Common Factors
        - In this section, you will solve quadratic equations by factoring out the greatest common factor (GCF).
        - In this section, you will solve quadratic equations by grouping.
    6. Solving Quadratic Equations Using Patterns
        - In this section, you will solve quadratic equations by factoring using the sum-product pattern.
        - In this section, you will solve quadratic equations by factoring using the perfect square trinomial pattern.
        - In this section, you will solve quadratic equations by factoring using the difference of squares pattern.
    7. Completing the Square & the Quadratic Formula
        - In this section, you will complete the square to solve quadratic equations.
        - In this section, you will derive the quadratic formula from the process of completing the square.
        - In this section, you will use the quadratic formula to solve quadratic equations.
    8. Graphs of Quadratic Equations
        - In this section, you will generate points using quadratic equations to create corresponding graphs, called parabolas.
        - In this section, you will identify the vertex, axis of symmetry, zeros, and y-intercepts of graphs of quadratic equations.
        - In this section, you will factor quadratic polynomials and verify those factorizations with a graphing utility.
    9. Features of Graphs of Quadratic Equations
        - In this section, you will use multiple methods to locate zeros of quadratic

equations.
    - In this section, you will complete the square to locate the vertex and axis of symmetry of quadratic equations.
    - In this section, you will create graphs of quadratic equations.
10. Quadratic Equations Apply
11. Quadratic Equations Review
12. Quadratic Equations Unit Test

6. **2-Variable Equations & Inequalities**
    1. 2-Variable Equations & Inequalities Introduction
    2. Equations in Two Variables
        - In this section, you will determine if a given set of values will make a two-variable equation true.
        - In this section, you will show the solution set of a two-variable equation is the set of all points that lie on the curve, which could also be a line.
    3. Forms of 2-Variable Linear Equations
        - In this section, given any point on the line and the slope of the line or given two points on the line, you will write linear equations in point-slope form.
        - In this section, you will write a linear equation in slope-intercept form when given a point and the slope of the line and only two points on the line.
        - In this section, you will write a linear equation in standard form given a point on the line and the slope of the line or given only two points on the line.
    4. Slope & 2-Variable Linear Equations
        - In this section, you will determine the slope of a line given a table, a graph, two points on the line, and a linear equation in any form.
        - In this section, you will write linear equations in various forms given a table, graph, and verbal description.
        - In this section, you will write and solve equations involving direct variation.
    5. Parallel & Perpendicular Lines
        - In this section, you will write the equation of a line that goes through a given point and is parallel to another given line.
        - In this section, you will write the equation of a line that goes through given points and is perpendicular to a given line.
        - In this section, you will write an equation of a line that is parallel or perpendicular to the x- or y-axis, noting if its slope is zero or undefined.
    6. Inequalities in Two Variables
        - In this section, you will determine if given values are solutions to two-variable linear inequalities.
        - In this section, you will show the solution of a two-variable linear inequality is the set of all points that lie on a half-plane bounded by the line (and may or may not include the line).
        - In this section, you will write two-variable linear inequalities given a table, graph, and verbal description.
    7. Solution Sets of Simultaneous Equations
        - In this section, you will determine if given coordinate pairs are solutions to systems of equations.
        - In this section, you will use tables and graphs to identify the solutions to systems of equations.
        - In this section, you will describe systems of equations with solutions of zero or with infinite solutions.
    8. Solving Simultaneous Linear Equations
        - In this section, you will show that replacing one equation in a system of

linear equations with the sum of that equation and a multiple of the other produces an equivalent system of equations.

9. Solution Sets of Simultaneous Inequalities
    - In this section, you will determine if given coordinate pairs are solutions to simultaneous inequalities.
    - In this section, you will show that the solution set of simultaneous two-variable linear inequalities is the intersection of the half-planes containing the solutions to each inequality and possibly one or both sections of the lines themselves.
    - In this section, you will describe simultaneous inequalities that have zero solutions.
10. Solving Practical Problems
    - In this section, you will write a system of two linear equations modeling a practical situation that illustrates the reasonableness of the algebraic or graphic solution.
    - In this section, you will solve practical problems involving equations and systems of equations.
    - In this section, you will solve practical problems involving inequalities and check possible solutions using a graphing utility.
11. 2-Variable Equations & Inequalities Apply
12. 2-Variable Equations & Inequalities Review
13. 2-Variable Equations & Inequalities Portfolio

7. **Functions & Their Graphs**
    1. Functions & Their Graphs Introduction
    2. Relations & Functions
        - In this section, you will explain that a function is a specific type of relation that assigns each element of one set (the domain) to exactly one element of another set (the range).
        - In this section, you will identify function and non-function relationships in a variety of representations.
    3. Relations & Functions Discussion
    4. Naming, Evaluating, & Interpreting Functions
        - In this section, you will use function notation to describe a functional relationship between two quantities.
        - In this section, you will evaluate functions for inputs in their domains.
        - In this section, you will interpret statements using function notation in terms of a context.
    5. Representing Functions
        - In this section, you will create input-output tables for a variety of function equations.
        - In this section, you will use input-output tables to create graphs of functions.
        - In this section, you will relate verbal, numeric, algebraic, and graphical representations of functions to each other.
    6. Linear Functions from Situations
        - In this section, you will define appropriate quantities, origin and scale of graphs of linear functions from real-world situations.
        - In this section, you will plot points to create linear functions from situations.
        - In this section, you will interpret key features of linear function graphs in context.
    7. Piecewise Linear Functions from Situations
        - In this section, you will define appropriate quantities, origin and scale for

graphs of piecewise linear functions when given different situations.
    - In this section, based on different situations, you will plot points to create graphs of piecewise functions.
    - In this section, you will interpret key features of piecewise linear function graphs in context.
8. Exponential Functions from Situations
    - In this section, you will define appropriate quantities, origin, and scale for graphs of exponential functions from situations.
    - In this section, you will plot points to create graphs of exponential functions from situations.
    - In this section, you will interpret key features of exponential function graphs in context.
9. Quadratic Functions from Situations
    - In this section, you will define appropriate quantities, origin and scale for graphs of quadratic functions from situations.
    - In this section, you will plot points to create graphs of quadratic functions from situations.
    - In this section, you will interpret key features of quadratic function graphs in context.
10. Functions & Their Graphs Apply
11. Functions & Their Graphs Review
12. Functions & Their Graphs Unit Test

8. **Linear & Exponential Sequences**
    1. Linear & Exponential Sequences Introduction
    2. Introduction to Sequences
        - In this section, you will determine the values of terms in a given sequence.
        - In this section, you will classify a list of numbers by the type of rule that generates it, either as an arithmetic sequence, a geometric sequence, another type of sequence, or not a known sequence.
        - In this section, you will use subscript notation to describe sequences and terms, and you will relate this notation to function notation.
    3. Formulas for Sequences
        - In this section, you will use recursive and explicit formulas to write sequences.
        - In this section, you will use recursive formulas for arithmetic and geometric sequences.
        - In this section, you will use explicit formulas for arithmetic and geometric sequences.
    4. Arithmetic Sequences
        - In this section, you will graph arithmetic sequences on coordinate grids with the term number on the x-axis and the term on the y-axis.
        - In this section, you will show that arithmetic sequence formulas have the same structure as linear functions.
        - In this lesson, you will write functions to represent arithmetic sequences.
    5. Geometric Sequences
        - In this lesson, you will graph geometric sequences on coordinate grids with the term number as the horizontal axis and term as the vertical axis.
        - In this section, you will show formulas for geometric sequences have the same structure as exponential function equations.
        - In this section, you will write functions to represent geometric sequences in given situations.

6. Linear Change
    - In this section, you will create sequences for situations that describe linear change.
    - In this section, you will create formulas and graphs for situations depicting linear change.
    - In this section, you will discuss the features of graphs that show linear change.
7. Exponential Growth
    - In this section, you will create sequences for exponential growth situations.
    - In this section, you will create graphs and equations for exponential growth situations.
    - In this section, you will discuss the key features of graphs that show exponential growth.
8. Exponential Decay
    - In this section, you will create sequences that describe exponential decay.
    - In this section, you will create formulas and graphs to represent exponential decay problems.
    - In this section, you will discuss the key features of graphs showing exponential decay.
9. Linear & Exponential Sequences Apply
10. Linear & Exponential Sequences Review
11. Linear & Exponential Sequences Portfolio

9. **Algebra 1 A Semester Review & Exam**
    1. Algebra 1 A Semester Review
    2. Algebra 1 A Semester Exam

Semester B Summary:

In this course, students will learn, practice, and apply skills and strategies that will help them grow into strong mathematical thinkers. The course presents math as a complete subject to be studied, not merely sets of rules and formulas to be followed. Arriving at solutions is important, as are precision and vocabulary, but instruction does not center on procedural math only. Instead, instruction encourages depth of understanding, connections within and outside courses, flexibility of approaches, and usage of various tools. Daily instruction supports student learning of core algebraic concepts and development of procedural fluency regarding function analysis, transformations of functions, solving problems with functions, univariate data sets, bivariate data sets, and modeling with algebra. Each instructional learning object is aligned to and framed by one of eight Standards for Mathematical Practice. Students are encouraged to use visual representations of their thinking to bridge their understanding between the concrete and abstract, allowing patterns and geometric principles to come to life. In peer model videos throughout the course, the learner's peers demonstrate how to apply targeted mathematical skills, often using real-world examples. Instruction in 21st century skills further illustrates connections between mathematical concepts and real-world situations to support students' development of the abilities, knowledge, and expertise they need to thrive in today's world. Mathematical discussion prompts encourage students to revise misconceptions, uncover nuances in application, make connections to prior knowledge, identify patterns, and engage with vocabulary. Students are encouraged to share their thinking, justify their own solutions, read critically, and constructively critique the reasoning of others. The course is designed to support a growth mindset regarding math and encourages students to engage in productive struggle; instructional materials implicitly and explicitly remind students that mistakes are opportunities

for learning and acquiring new skills. Together the course elements ensure the student grows as a mathematical thinker and develops the tools necessary for success at work and in life.

Semester B Outline

1. **Honors Algebra 1 B Course Overview**
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2. **Function Analysis**
    1. Function Analysis Introduction
    2. Linear Functions
        - In this section, you will determine the domain and range of linear functions and write them as inequalities.
        - In this section, you will calculate the average rate of change of a linear function from an equation, table, or graph.
    3. Piecewise Linear Functions
        - In this section, you will graph piecewise linear functions given equations.
        - In this section, you will write equations of piecewise linear functions from graphs.
    4. Quadratic Functions in Vertex Form
        - In this section, you will determine the domain and range of a quadratic function in vertex form and write them using inequalities.
        - In this section, you will graph quadratics given in vertex form.
        - In this section, you will write equations of quadratics in vertex form given a graph.
    5. Quadratic Functions in Standard Form
        - In this section, you will determine the domain and range of a quadratic function in standard form and write them using inequalities.
        - In this section, you will graph quadratic functions given in standard form.
        - In this section, you will write quadratic equations in standard form given a graph.
    6. Exponential Functions
        - In this section, you will determine the domain and range of an exponential function, using inequalities to represent them.
        - In this section, you will graph exponential functions given equations.
        - In this section, you will write equations for exponential functions given a graph.
    7. Square Root Functions
        - In this section, you will graph square root functions given equations.
        - In this section, you will identify key features of square root functions from graphs and compare with related quadratic functions.
    8. Cube Root Functions
        - In this section, you will graph cube root functions given equations.
        - In this section, you will identify key features from the graph of a cube root function and compare them to the features of the graph of a square root function.
    9. Comparing Shapes of Functions
        - In this section, you will compare the shapes of linear, quadratic, exponential, and cubic functions.
        - In this section, you will compare the shapes of square root and cube root graphs.
    10. Average Rate of Change

- In this lesson, you will calculate the average rate of change between two points using a variety of functions.
- In this lesson, you will describe function graphs in terms of average rates of change.

11. Comparing Average Rates of Change
    - In this section, you will compare estimated average rates of change of quadratic and exponential functions.
    - In this lesson, you will compare estimated average rates of change of square root and cube root functions.
12. Function Analysis Apply
13. Function Analysis Review
14. Function Analysis Unit Test

3. **Transformations of Functions**
    1. Transformations of Functions Introduction
    2. Parent Functions
        - In this section, you will use graphs, equations, and tables to informally show that every linear function is an altered version of $f(x) = x$.
        - In this section, you will show how a single simple parent function can be transformed to create a whole family of functions.
        - In this section, you will describe transformations from parent functions.
    3. Reflections About the x-axis
        - In this section, you will show using tables and graphs how $y = -f(x)$ results in the function $y = f(x)$ being reflected over the x-axis.
        - In this section, you will describe the transformation from $y = f(x)$ to function graphs of the form $y = -f(x)$.
    4. Reflections About the y-axis
        - In this section, you will use tables and graphs to show how $y = f(-x)$ results in the function $y = f(x)$ being reflected over the y-axis.
        - In this section, you will describe the transformation from $y = f(x)$ to function graphs of the form $y = f(-x)$.
    5. Reflections About the Origin
        - In this section, you will use tables and graphs to show how $y = -f(-x)$ results in the function $y = f(x)$ being reflected over both the y- and x-axes, otherwise known as the origin.
        - In this section, you will describe the transformation from $y = f(x)$ to function graphs of the form $y = -f(-x)$.
    6. Even & Odd Functions
        - In this section, you will identify functions that look the same after being reflected about the y-axis as even functions.
        - In this section, you will be able to identify functions that look the same after being reflected about the origin as an odd function.
    7. Vertical Shifts
        - In this lesson, you will use tables and graphs to show how $y = f(x) \pm k$ results in the function $y = f(x)$ being translated up or down k units.
        - In this lesson, you will use graphs and equations that show vertical shifts, identify k, and demonstrate the effects vertical shifts have on $y = f(x)$.
        - In this section, you will describe the transformations from $y = f(x)$ to function graphs of the form $y = f(x) \pm k$.
    8. Horizontal Shifts
        - In this lesson, you will use tables and graphs to show that $y = f(x \pm k)$ results in the function $y = f(x)$ being translated left or right k units.

- In this section, you will use graphs and equations that show horizontal shifts to identify k and demonstrate the effects horizontal shifts have on $y = f(x)$.
- In this lesson, you will describe the transformations from $y = f(x)$ to function graphs of the form $y = f(x \pm k)$.

9. Vertical Stretches & Compressions
    - In this section, you will use tables and graphs to show that $y = kf(x)$ results in the function $y = f(x)$ being vertically stretched or compressed by k.
    - In this section, you will use graphs and equations that show vertical stretches or compressions to identify k and its effect on $y = f(x)$.
    - In this section, you will describe the transformations from $y = f(x)$ to function graphs of the form $y = kf(x)$.
10. Horizontal Stretches & Compressions
    - In this section, you will use tables and graphs to show how $y = f(kx)$ will horizontally stretch or compress (dilate) $y = f(x)$ by a factor of k.
    - In this section, you will identify k and the effect it has on $y = f(x)$ from graphs and equations showing horizontal stretches or compressions.
    - In this section, you will describe the transformations from$y = f(x)$ to function graphs of the form $y = f(kx)$.
11. Multiple Transformations
    - In this section, you will show using tables and graphs that combinations of transformations should be performed according to the order of operations.
    - In this section, you will identify in order the transformations undergone by a function from its equation.
    - In this section, you will show using tables and graphs that combinations of transformations should be performed according to the order of operations.
    - In this section, you will identify in order the transformations undergone by a function from its equation.
12. Analyzing a Graph
    - In this section, you will interpret the key features of a function graph to identify its type of transformation from the parent function.
    - In this section, you will create a table or equation to use as a model of a given function graph.
    - In this section, you will interpret the key features of a function graph to identify its type of transformation from the parent function.
    - In this section, you will create a table or equation to use as a model of a given function graph.
13. Transformations of Functions Apply
14. Transformations of Functions Review
15. Transformations of Functions Portfolio

4. **Solving Problems with Functions**
    1. Solving Problems with Functions Introduction
    2. The Usefulness of Graphs
        - In this section, you will show how equations can be solved by creating functions with the expressions and finding their intersection(s) to reveal the solution(s).
        - In this section, you will use function graphs to solve equations with a constant on one side.
        - In this section, you will use function graphs to solve equations with algebraic expressions on both sides.
    3. Linear Functions in Context
        - In this section, you will create linear function equations and graphs from

real-life situations.
    - In this section, you will interpret graphs of linear functions in context.
    - In this section, you will use linear function graphs to solve real-world problems.
4. Piecewise Linear Functions in Context
    - In this section, you will create piecewise linear function equations and graphs.
    - In this section, you will interpret the graphs of piecewise linear functions through their contextual meaning.
    - In this section, you will use piecewise linear function graphs to solve real-world problems.
5. Exponential Functions in Context
    - In this section, you will create exponential functions and graphs in the context of real-world problems.
    - In this section, you will interpret graphs of exponential functions describing a specific context.
    - In this section, you will use graphs of exponential functions to solve word problems.
6. Quadratic Functions in Context
    - In this section, you will create quadratic function equations and graphs in the context of solving real-world problems.
    - In this section, you will interpret graphs of quadratic functions and their contextual meaning.
    - In this section, you will use quadratic function graphs to solve contextual problems.
7. Multiple Function Types in Context
    - In this section, you will compare function equations and graphs in related contexts to one another.
    - In this section, you will interpret contextual graphs of different functions on the same axes.
    - In this section, you will use multiple function graphs to solve real-world problems.
8. Combining Function Types in Context
    - In this section, you will use pieces of different functions to represent and describe the behavior of a real-life scenario.
    - In this section, you will combine functions to create new functions to represent situations.
9. Solving Problems with Functions Prompt
10. Solving Problems with Functions Discussion
11. Solving Problems with Functions Apply
12. Solving Problems with Functions Review
13. Solving Problems with Functions Unit Test

5. **Univariate Datasets**
    1. Univariate Datasets Introduction
    2. Describing Distributions
        - In this section, you will formulate questions about datasets that could be answered by describing the shape, center, and spread of the data, and datasets that are displayed with dot plot models.
        - In this section, you will formulate questions about datasets that could be answered by describing the shape, center, and spread of the data, and that are displayed with histogram models.

- In this section, you will formulate questions about datasets that could be answered by describing the shape, center, and spread of the data, and that are displayed with box plot models.

3. Centers of Distributions
    - In this section, you will compare the means and medians of symmetrical data by using dot plots.
    - In this section, you will compare the means and medians of skewed data represented in a dot plot.
    - In this section, you will explain how the shape of distribution determines the most appropriate measure of center.
4. Estimations of Centers
    - In this section, you will estimate the mean and median of data distributions.
    - In this section, you will explain mean as a balance point when both mean and median are not good descriptors.
5. Deviation from the Mean
    - In this section, you will calculate the deviations from the mean for symmetric datasets that have the same mean.
    - In this section, you will compare deviations, interpreting larger deviations as greater spread or variability and smaller deviations as smaller spread or variability.
6. Standard Deviation
    - In this section, you will calculate the standard deviation of symmetric datasets.
    - In this section, you will interpret the standard deviation as a measure of the spread of variability for a symmetric data set that represents the typical distance from a data point.
    - In this section, you will use standard deviation to compare the relative variability of distributions.
7. Interquartile Range
    - In this section, you will construct box plots by calculating five-number summaries and interquartile ranges for skewed datasets and identify any outliers.
    - In this section, you will interpret the interquartile range as a way to describe the variability for skewed datasets.
8. Comparing Distributions
    - In this section, you will compare two or more related symmetric distributions.
    - In this section, you will compare two or more related skewed distributions.
9. Univariate Datasets Apply
10. Univariate Datasets Review
11. Univariate Datasets Unit Test

6. **Bivariate Datasets**
    1. Bivariate Datasets Introduction
    2. Two-Way Frequency Tables
        - In this lesson, you will distinguish the differences between numerical and categorical data.
        - In this section, you will use two-way frequency tables to compare, organize, and interpret data.
    3. Relative Frequencies
        - In this section, you will use two-way frequency tables to obtain and interpret relative frequency tables.
        - In this section, you will use two-way frequency tables to calculate and

interpret conditional relative frequency.
    - In this section, you will interpret conditional relative frequencies to determine whether variables or categories are the result of association and not causation.
4. Relationships Between Two Numerical Variables
    - In this section, you will distinguish between linear and nonlinear relationships in scatterplots.
    - In this section, you will use data, models, and scatterplots that model nonlinear relationships to analyze situations.
5. Linear Models
    - In this section, you will use technology to determine the least squares regression line from a given dataset.
    - In this section, you will interpret the slope and y-intercept of linear models in the context of the data.
    - In this section, you will use linear models to make predictions.
6. Residuals
    - In this section, you will graph residuals between data and corresponding linear models.
    - In this section, you will use residual plots to determine the reliability of linear models and the accuracy of predictions made by using them.
    - In this section, you will connect shapes of scatter plots to shapes of corresponding residual plots.
7. Correlation Coefficient
    - In this section, you will use technology to determine the correlation coefficient (r-value) for a dataset.
    - In this section, you will interpret what the correlation coefficient of a data set means in terms of its strength and direction on the coordinate plane.
8. Correlation Between Variables
    - In this section, you will estimate the correlation coefficients (r-values) of scatterplots in a variety of forms.
    - In this section, you will pair residual analysis and the correlation coefficient (r-value) of a dataset to determine whether the linear model (line of best fit) is appropriate.
9. Correlation, not Causation
    - In this section, you will explain why correlation in a dataset does not necessarily imply causation.
10. Correlation, not Causation Discussion
11. Analyzing a Dataset
    - In this section, you will recognize various datasets that represent linear functions, quadratic functions, and exponential functions.
    - In this section, you will create models of datasets that represent linear functions, quadratic functions, and exponential functions.
12. Bivariate Datasets Apply
13. Bivariate Datasets Review
14. Bivariate Datasets Unit Test

7. **Modeling with Algebra**
    1. Modeling with Algebra Introduction
    2. Creating a Model from a Graph
        - In this section, you will interpret key features of contextual function graphs to identify their types.
        - In this section, you will create a table and equation to use as a model when

given a contextual graph.

3. Using a Model from a Graph
    - In this section, you will interpret a function graph and model in terms of the context.
    - In this section, you will report graphical analysis results with an appropriate level of precision.
4. Creating a Model from a Sequence
    - In this section, you will identify a given sequence in context as arithmetic, geometric, or another type.
    - In this section, you will create a function to use as a model of a given sequence in context.
5. Using a Model from a Sequence
    - In this section, you will interpret a sequence in context using its graph and model.
    - In this section, you will analyze sequences and report your results using an appropriate level of precision.
6. Creating a Model from a Dataset
    - In this section, you will decide which type of model fits a bivariate dataset best.
    - In this section, you will create appropriate regression models given a bivariate dataset.
7. Using a Model from a Dataset
    - In this section, you will interpret a bivariate dataset in context using its scatterplot and regression model.
    - In this section, you will report bivariate data analysis results with an appropriate level of precision.
8. Creating a Model from a Verbal Description
    - In this section, you will decide if a linear, quadratic, or exponential model will best represent a verbal description of a context.
    - In this section, you will create an appropriate model from a verbal description.
9. Using a Model from a Verbal Description
    - In this section, you will interpret a verbal description of a context using its function and graph.
    - In this section, you will analyze a verbal description of a context using its function and graph with an appropriate level of precision and report the results.
10. Modeling with Algebra Apply
11. Modeling with Algebra Review
12. Modeling with Algebra Portfolio

8. **Algebra 1 B Semester Review & Exam**
    1. Algebra 1 B Semester Review
    2. Algebra 1 B Semester Exam