Alta Elementary and Intermediate Algebra was developed to meet the scope and sequence of a typical one-semester algebra course. To develop the course, Knewton used three main sources of content: OpenStax, videos created by a Math Professor we have partnered with, and a team of Subject Matter Experts. The SMEs come from diverse backgrounds and are all academics in the field of mathematics.

Alta Elementary and Intermediate Algebra has two instructional sequences for every learning objective, giving students multiple opportunities to learn new concepts. Between our OpenStax text, video content, and Knewton SMEs, we were able to solicit ideas from math instructors and students at all levels of higher education. Knewton Elementary Algebra covers the typical breadth of algebra topics, and also provides the necessary depth to ensure the course is manageable and engaging for instructors and students alike.
Chapter 1: Foundations

1.1 Introduction to Whole Numbers
- Place Values and Rounding
  - Identify the place value of a digit and write a whole number using words or digits
  - Round whole numbers
- Prime Factorization and Least Common Multiples
  - Identify multiples and apply divisibility tests
  - Find the prime factorization of a number
  - Find the least common multiple of two numbers

1.2 Use the Language of Algebra
- Use Variables and Algebraic Symbols
  - Translate algebraic expressions, equations, and inequalities into English and recognize expressions and equations
  - Evaluate a whole number raised to a power and understand the terminology
- Order of Operations and Simplifying Expressions
  - Simplify an expression using order of operations
  - Evaluate an expression
  - Identify coefficients and identify and combine like terms
- Rewrite English Phrases into Algebraic Expressions
  - Translate an English phrase to an algebraic expression
  - Translate English phrases from applications into algebraic expressions

1.3 Add and Subtract Integers
- Introduction to Integers and Absolute Value
  - Order integers using inequality symbols and determine the opposite of integers or variables
  - Evaluate an absolute value expression
  - Simplify an expression involving absolute value using order of operations
- Adding and Subtracting Integers
  - Add integers
  - Subtract integers
  - Add and subtract integers using order of operations

1.4 Multiply and Divide Integers
- Multiplying and Dividing Integers
  - Multiply integers
  - Divide integers
- Simplifying Expressions with Integers
  - Simplify expressions with integers using order of operations
  - Evaluate a variable expression with integers
- Algebraic Expressions and Applications with Integers
  - Translate an English phrase to an algebraic expression with integers
  - Use integers in applications
1.5 Visualize Fractions
   - Simplifying Fractions
     - Identify when fractions are equivalent
     - Simplify a fraction
   - Multiplying and Dividing Fractions
     - Multiply fractions
     - Divide fractions
     - Simplify complex fractions
   - Understanding Expressions with Fractions
     - Simplify expressions written with a fraction bar
     - Translate an English phrase to an expression with fractions

1.6 Add and Subtract Fractions
   - Adding and Subtracting Fractions
     - Add or subtract fractions with a common denominator
     - Add or subtract fractions with different denominators
   - Algebraic Expressions with Fractions
     - Use the order of operations to simplify complex fractions and expressions with multiple operations
     - Evaluate variable expressions with fractions

1.7 Decimals
   - Understanding and Rounding Decimals
     - Name and write decimals
     - Round decimals
   - Operations with Decimals
     - Add and subtract decimals
     - Multiply decimals
     - Divide decimals
   - Decimals, Fractions, and Percents
     - Convert between fractions and decimals
     - Simplify expressions with fractions and decimals
     - Convert between decimals and percents

1.8 Square Roots and the Real Number System
   - Square Roots and the Real Number System
     - Evaluate a square root
     - Identify rational and irrational numbers
     - Identify real numbers
   - Fractions and Decimals on the Number Line
     - Locate fractions on a number line and write inequality statements involving fractions (*11)
     - Locate decimals on a number line and write inequality statements involving decimals (*11)

1.9 Properties of Real Numbers
   - Properties of the Real Number System
     - Use the commutative and associative properties
     - Identify additive and multiplicative inverses of a number
● Understand the multiplication and division properties of zero
● Simplify expressions using properties of identities, inverses, and zero

● The Distributive Property
  ● Simplify expressions using the distributive property
  ● Simplify expressions by distributing a negative number

1.10 Systems of Measurements
● Unit Conversion in the US System
  ● Make unit conversions in the US system
  ● Use mixed units of measurement in the US system
● Unit Conversion in the Metric System
  ● Make unit conversions in the metric system
  ● Use mixed units of measurement in the metric system
● Unit Conversion Between Systems
  ● Convert between the US and metric systems of measurement
  ● Convert between Fahrenheit and Celsius temperatures

Chapter 2: Solving Linear Equations and Inequalities
2.1 Solve Equations Using the Subtraction and Addition Properties of Equality
  ● Solve Equations with the Subtraction and Addition Properties of Equality
  ● Verify a solution of an equation
  ● Solve an equation using the subtraction and addition properties of equality
  ● Solve an equation involving fractions or decimals using the subtraction and addition properties of equality
  ● Solve an equation that requires simplification using the subtraction and addition properties of equality
  ● Application Problems and the Subtraction and Addition Properties of Equality
  ● Translate an English sentence to an algebraic equation and solve using the subtraction and addition properties of equality
  ● Use the subtraction and addition properties of equality to solve application problems

2.2 Solve Equations Using the Division and Multiplication Properties of Equality
  ● Solve Equations with the Division and Multiplication Properties of Equality
  ● Solve an equation using the division and multiplication properties of equality
  ● Solve an equation involving fractions or decimals using the division and multiplication properties of equality
  ● Solve an equation that requires simplification using the division and multiplication properties of equality
  ● Application Problems and the Division and Multiplication Properties of Equality
  ● Translate an English sentence to an algebraic equation and solve using the division and multiplication properties of equality
  ● Use the division and multiplication properties of equality to solve application problems
2.3 Solve Equations with Variables and Constants on Both Sides
   ● Solving Linear Equations
     ● Solve an equation with constants on both sides
     ● Solve an equation with variables on both sides
     ● Solve an equation with constants and variables on both sides

2.4 Use a General Strategy to Solve Linear Equations
   ● General Strategies for Solving Linear Equations
     ● Solve an equation using the distributive property with variables on one side
     ● Solve an equation using the distributive property with variables on both sides
     ● Classify equations as conditional, identity, or a contradiction

2.5 Solve Equations with Fractions or Decimals
   ● Solving Linear Equations with Fractions
     ● Solve an equation involving fractions with variables on both sides
     ● Solve an equation involving fractions by eliminating the fractions
     ● Solve an equation involving fractions by eliminating the fractions and other steps
   ● Solve Linear Equations with Decimals
     ● Solve an equation involving decimals with variables on both sides
     ● Solve an equation involving decimals by clearing the decimals

2.6 Solve a Formula for a Specific Variable
   ● Distance, Rate, and Time and Literal Equations
     ● Use the distance, rate, and time formula
     ● Solve a formula for a specific variable

2.7 Solve Linear Inequalities
   ● Inequalities, the Number Line, and Interval Notation
     ● Graph an inequality on the number line
     ● Express an inequality using interval notation
   ● Solving One-Step Linear Inequalities
     ● Solve an inequality using the subtraction and addition properties of inequality
     ● Solve an inequality using the division and multiplication properties of inequality
   ● Solving Linear Inequalities
     ● Solve an inequality that requires simplification
     ● Classify an inequality as conditional, identity, or contradiction
     ● Translate an English sentence into an inequality and solve

2.8 Solve Compound Inequalities
   ● Solving Compound Inequalities
     ● Solve a compound inequality involving intersections
     ● Solve a compound inequality involving unions
     ● Solve applications with compound inequalities

2.9 Solve Absolute Value Equations and Inequalities
   ● Solving Absolute Value Equations and Inequalities
     ● Solve an absolute value equation
     ● Solve an absolute value inequality involving "less than"
     ● Solve an absolute value inequality involving "greater than"
     ● Solve applications with absolute value
Chapter 3: Math Models

3.1 Use a Problem-Solving Strategy
- An Introduction to Problem Solving
  - Use a problem-solving strategy for word problems
  - Solve a number problem
  - Solve a number problem involving consecutive integers

3.2 Solve Percent Applications
- Percent Problems and Percent Increase and Decrease
  - Translate and solve basic percent equations
  - Solve basic applications of percent
  - Find percent increase or percent decrease
- Simple Interest and Discounts
  - Solve applications involving the simple interest formula
  - Solve applications with discount or mark-up

3.3 Solve Mixture Applications
- Solve Mixture Word Problems
  - Solve coin word problems
  - Solve ticket and stamp word problems
  - Use the mixture model to solve word problems

3.4 Solve Geometry Applications - Triangles, Rectangles, and the Pythagorean Theorem
- Triangles and the Pythagorean Theorem
  - Solve problems involving the perimeter, area, and interior angles of triangles
  - Solve triangle problems where angles or sides are given in terms of other angles or sides
  - Solve triangle problems using the Pythagorean Theorem
- Area and Perimeter of Rectangles
  - Solve problems involving the perimeter and area of rectangles
  - Solve rectangle problems when the width is given in terms of the length

3.5 Solve Uniform Motion Applications
- Uniform Motion
  - Solve uniform motion applications

3.6 Solve Applications with Linear Inequalities
- Problem Solving with Linear Inequalities
  - Solve one-step applications with linear inequalities
  - Solve applications with linear inequalities

Chapter 4: Graphs and an Introduction to Functions

4.1 Use the Rectangular Coordinate System
- Reading Graphs and the Rectangular Coordinate System
  - Plot points on a rectangular coordinate system (*22)
  - Verify the solution to an equation in two variables
  - Complete a table of solutions to a linear equation in two variables
  - Find solutions to a linear equation
4.2 Graph Linear Equations in Two Variables
- Graphing Linear Equations
  - Recognize the relationship between the solutions of an equation and its graph
  - Graph a linear equation by plotting points (*23)
  - Graph a linear equation in standard form by plotting points (*23)
  - Graph vertical and horizontal lines (*24)

4.3 Graph with Intercepts
- Intercepts on the Coordinate Plane
  - Identify the x- and y-intercepts on a graph
  - Find the x- and y-intercepts from an equation of a line
  - Graph a line using the x- and y-intercepts (*23)

4.4 Understand Slope of a Line
- Understanding Slope
  - Use a geoboard to model slope (*13)
  - Use the relationship between rise and run to find the slope of a line from its graph
  - Find the slope of horizontal and vertical lines
- The Slope Formula
  - Use the slope formula to find the slope of a line between two points
  - Graph a line given a point and the slope (*22)
  - Determine the slope in applications

4.5 Use the Slope-Intercept Form of an Equation of a Line
- Slope-Intercept Form
  - Identify the slope and y-intercept from an equation of a line and relate a graph to the equation
  - Graph a line given its equation using its slope and y-intercept (*23)
  - Graph lines using a variety of methods
  - Graph and interpret applications of slope-intercept
- Parallel and Perpendicular Lines
  - Use slopes to identify parallel lines
  - Use slopes to identify perpendicular lines

4.6 Find the Equation of a Line
- Equations of Lines
  - Find an equation of the line given the slope and y-intercept
  - Find an equation of the line given the slope and a point
  - Find an equation of the line given two points
- Equations of Parallel and Perpendicular Lines
  - Find an equation of a line parallel to a given line
  - Find an equation of a line perpendicular to a given line

4.7 Graphs of Linear Inequalities
- Graphing Linear Inequalities
  - Verify solutions to an inequality in two variables
  - Recognize the relationship between the solutions of an inequality and its graph
  - Graph a linear inequality (*22)
4.8 Relations and Functions
● Introduction to Functions
  ● Find the domain and range of a relation
  ● Determine if a relation is a function given a set of ordered pairs or a mapping
  ● Determine if a relation is a function given an equation
● Function Notation
  ● Use function notation to find the value of a function given a number
  ● Use function notation to find the value of a function given a variable expression
4.9 Graphs of Functions
● The Vertical Line Test and Graphs of Functions
  ● Use the vertical line test to determine if a graph represents a function
  ● Identify graphs of basic functions
  ● Read information from the graph of a function

Chapter 5: Systems of Linear Equations
5.1 Solve Systems of Equations by Graphing
● Solving Systems of Linear Equations by Graphing
  ● Determine whether an ordered pair is a solution of a system of linear equations
  ● Solve a system of linear equations by graphing (*13)
  ● Determine the number of solutions of a linear system
  ● Solve applications of systems of linear equations by graphing
5.2 Solve Systems of Equations by Substitution
● Solving Systems of Linear Equations by Substitution
  ● Solve a system of linear equations by substitution
  ● Solve applications of systems of linear equations by substitution
5.3 Solve Systems of Equations by Elimination
● Solving Systems of Linear Equations by Elimination
  ● Solve a system of linear equations by elimination
  ● Solve applications of systems of equations by elimination
  ● Solve a system of linear equations using a variety of methods
5.4 Solve Applications with Systems of Equations
● Systems of Linear Equations and Problem Solving
  ● Translate a word problem to a system of equations
  ● Solve a word problem using a system of equations
  ● Solve an application in geometry using a system of equations
  ● Solve uniform motion applications using a system of equations
5.5 Solve Mixture Applications with Systems of Equations
● Mixture Problems and Systems of Equations
  ● Solve mixture applications involving tickets or money with a system of equations
  ● Solve mixture applications involving concentrations using a system of equations
  ● Solve interest applications using a system of equations
5.6 Solve Systems of Equations with Three Variables
   ● Solving Systems of Linear Equations in Three Variables
     ● Determine whether an ordered triple is a solution of a system of three linear equations with three variables
     ● Solve a system of linear equations with three variables
     ● Identify inconsistent and dependent systems of equations with three variables
     ● Solve applications using systems of linear equations in three variables

5.7 Solve Systems of Equations Using Matrices
   ● Solving Systems of Linear Equations with Matrix Row Operations
     ● Write the augmented matrix for a system of equations
     ● Use row operations on a matrix
     ● Solve a system of equations using matrices

5.8 Solve Systems of Equations Using Determinants
   ● Determinants of Matrices
     ● Evaluate the determinant of a 2x2 matrix
     ● Evaluate the minor of an element in a 3x3 matrix
     ● Evaluate the determinant of a 3x3 matrix
   ● Solving Systems of Linear Equations with Cramer's Rule and Determinants
     ● Use Cramer's Rule to solve systems of equations in two variables
     ● Use Cramer's Rule to solve systems of equations in three variables
     ● Use determinants to determine if three given points are collinear

5.9 Graphing Systems of Linear Inequalities
   ● Solving Systems of Linear Inequalities
     ● Determine whether an ordered pair is a solution of a system of linear inequalities
     ● Solve a system of linear inequalities by graphing
     ● Solve applications of systems of linear inequalities

Chapter 6: Polynomials
6.1 Add and Subtract Polynomials
   ● Adding and Subtracting Polynomials
     ● Identify the types and degrees of polynomials
     ● Add and subtract monomials
     ● Add and subtract polynomials
     ● Evaluate a polynomial for a given value

6.2 Use Multiplication Properties of Exponents
   ● Product Properties of Exponents
     ● Simplify numerical expressions containing exponents
     ● Simplify expressions using the product property for exponents
     ● Simplify expressions using the power property for exponents or the product to a power property for exponents
     ● Simplify expressions by applying several properties
6.3 Multiply Polynomials
   ● Multiplying Polynomials
     ● Multiply monomials
     ● Multiply a polynomial by a monomial
     ● Multiply a binomial by a binomial
     ● Multiply a trinomial by a binomial

6.4 Special Products
   ● Special Products of Binomials
     ● Square a binomial using the binomial squares pattern
     ● Multiply conjugates using the product of conjugates pattern
     ● Recognize and use the appropriate special product pattern

6.5 Divide Monomials
   ● Quotient Properties of Exponents and Dividing Monomials
     ● Simplify expressions using the quotient property for exponents and the exponent of zero
     ● Simplify expressions using the quotient to a power property
     ● Simplify expressions by applying several quotient properties of exponents
     ● Divide monomials

6.6 Divide Polynomials
   ● Dividing Polynomials
     ● Divide a polynomial by a monomial
     ● Divide a polynomial by a binomial using polynomial long division
   ● Synthetic Division and the Remainder and Factor Theorems
     ● Use synthetic division to divide polynomials
     ● Use the remainder and factor theorems

6.7 Integer Exponents and Scientific Notation
   ● Negative Exponents
     ● Use the definition of a negative exponent
     ● Simplify expressions with integer exponents
   ● Scientific Notation
     ● Convert from decimal notation to scientific notation
     ● Convert from scientific notation to decimal notation
     ● Multiply and divide using scientific notation

Chapter 7: Factoring
7.1 Greatest Common Factor and Factor by Grouping
   ● The Greatest Common Factor and Factoring by Grouping
     ● Find the greatest common factor of two or more expressions
     ● Factor the greatest common factor from a polynomial
     ● Factor a polynomial by grouping

7.2 Factor Quadratic Trinomials with Leading Coefficient 1
   ● Factoring Trinomials with a Leading Coefficient of 1
     ● Factor a trinomial of the form $x^2+bx+c$ where $c$ is positive
     ● Factor a trinomial of the form $x^2+bx+c$ where $c$ is negative
     ● Factor a trinomial of the form $x^2+bx+y^2$
7.3 Factor Quadratic Trinomials with Leading Coefficient Other than 1
  ● Factoring Trinomials with a Leading Coefficient Other than 1
    ● Factor a trinomial of the form ax^2+bx+c with a GCF
    ● Factor a trinomial using trial and error
    ● Factor a trinomial using the 'ac' method

7.4 Factor Special Products
  ● Factoring Special Products
    ● Factor a perfect square trinomial
    ● Factor a difference of squares
    ● Factor polynomials by combining the difference of squares and perfect square trinomial patterns
    ● Factor sums and differences of cubes

7.5 General Strategy for Factoring Polynomials
  ● Choosing a Factoring Strategy
    ● Recognize and use the appropriate method to factor a polynomial completely

7.6 Quadratic Equations
  ● Solving Quadratic Equations by Factoring
    ● Solve a factored quadratic equation using the zero product property
    ● Solve a quadratic equation by factoring
    ● Solve applications modeled by quadratic equations

7.7 Polynomial Equations
  ● Solving Polynomial Equations by Factoring
    ● Use the zero product property to solve a factored polynomial equation
    ● Solve polynomial equations by factoring
    ● Find zeros and intercepts of a polynomial function by factoring
    ● Use factoring to solve application problems involving polynomial equations

Chapter 8: Rational Expressions and Equations
8.1 Simplify Rational Expressions
  ● Domain of Rational Expressions and Simplifying Rational Expressions
    ● Determine the values for which a rational expression is undefined
    ● Evaluate a rational expression
    ● Simplify a rational expression
    ● Simplify a rational expression with opposite factors

8.2 Multiply and Divide Rational Expressions
  ● Multiplying and Dividing Rational Expressions
    ● Multiply rational expressions
    ● Divide rational expressions
    ● Multiply and divide more than two rational expressions

8.3 Add and Subtract Rational Expressions with a Common Denominator
  ● Adding and Subtracting Rational Expressions with a Common Denominator
    ● Add rational expressions with a common denominator
    ● Subtract rational expressions with a common denominator
    ● Add and subtract rational expressions whose denominators are opposites
8.4 Add and Subtract Rational Expressions with Unlike Denominators
   ● Adding and Subtracting Rational Expressions with Unlike Denominators
     ● Find the least common denominator of rational expressions
     ● Find equivalent rational expressions
     ● Add rational expressions with different denominators
     ● Subtract rational expressions with different denominators

8.5 Simplify Complex Rational Expressions
   ● Simplifying Complex Fractions
     ● Simplify a complex rational expression by writing it as division
     ● Simplify a complex rational expression by using the LCD

8.6 Solve Rational Equations
   ● Solving Rational Equations
     ● Solve a rational equation that results in a linear equation
     ● Solve a rational equation that results in a quadratic equation
     ● Solve a rational equation for a specific variable

8.7 Solve Proportion and Similar Figure Applications
   ● Proportions and Problem Solving with Rational Equations
     ● Solve proportions
     ● Solve applications with proportions
     ● Solve similar figure applications

8.8 Solve Uniform Motion and Work Applications
   ● Uniform Motion, Work, and Problem Solving
     ● Solve uniform motion applications involving rational equations
     ● Solve problems involving rates of work using rational equations

8.9 Use Direct and Inverse Variation
   ● Variation and Problem Solving
     ● Solve direct variation problems
     ● Solve inverse variation problems

8.10 Solve Rational Inequalities
   ● Solving Rational Inequalities
     ● Find the solution set of a rational inequality
     ● Solve an inequality with rational functions

Chapter 9: Roots and Radicals
9.1 Simplify and Use Square Roots
   ● Understanding Square Roots
     ● Simplify expressions with square roots
     ● Estimate square roots and approximate square roots
     ● Simplify variable expressions with square roots

9.2 Simplify Square Roots
   ● Simplifying Square Root Expressions
     ● Use the product property to simplify square roots
     ● Use the quotient property to simplify a perfect square fraction
     ● Use the quotient property to simplify square roots
9.3 Add and Subtract Square Roots
   ● Adding and Subtracting Square Root Expressions
     ○ Add and subtract like square roots
     ○ Add and subtract square roots that need simplification

9.4 Multiply Square Roots
   ● Multiplying Square Root Expressions
     ○ Multiply square roots
     ○ Use polynomial multiplication to multiply square roots
     ○ Use special product formulas to multiply square roots

9.5 Divide Square Roots
   ● Dividing Square Root Expressions and Rationalizing Denominators
     ○ Divide square roots
     ○ Rationalize a one-term denominator
     ○ Rationalize a two-term denominator

9.6 Solve Equations with Square Roots
   ● Solving Radical Equations
     ○ Solve a square root equation with a single radical
     ○ Solve a square root equation with two radicals
     ○ Use square roots in applications

9.7 Higher Roots
   ● Understanding Higher Roots
     ○ Simplify numerical expressions with higher roots
     ○ Simplify expressions with higher roots
   ● Simplifying Higher Roots and Operations on Higher Roots
     ○ Use the product property to simplify expressions with higher roots
     ○ Use the quotient property to simplify expressions with higher roots
     ○ Add and subtract higher roots

9.8 Rational Exponents
   ● Simplifying Expressions with Rational Exponents
     ○ Simplify expressions with rational exponents and a numerator of 1
     ○ Simplify expressions with rational exponents and a numerator greater than 1
     ○ Use the laws of exponents to simplify expressions with rational exponents

9.9 Use Radicals in Functions
   ● Radical Functions
     ○ Evaluate a radical function
     ○ Find the domain of a radical function
     ○ Graph a radical function by plotting points and determine its range ('23)

9.10 Use the Complex Number System
   ● Introduction to Complex Numbers
     ○ Evaluate the square root of a negative number and understand the complex number system
     ○ Add or subtract complex numbers
Multiplying and Dividing Complex Numbers and Powers of i
- Multiply complex numbers
- Multiply two complex conjugates
- Divide complex numbers
- Simplify powers of i

Chapter 10: Quadratic Equations

10.1 Solve Quadratic Equations Using the Square Root Property
- Solving Quadratic Equations Using the Square Root Property
  - Solve a quadratic equation using the square root property
  - Solve a quadratic equation with a binomial as the quadratic term using the square root property
  - Solve a quadratic equation where factoring results in a perfect square binomial

10.2 Solve Quadratic Equations by Completing the Square
- Solving Quadratic Equations by Completing the Square
  - Complete the square of a binomial expression
  - Solve a quadratic equation with a leading coefficient of 1 by completing the square
  - Solve a quadratic equation with a leading coefficient greater than 1 by completing the square

10.3 Solve Quadratic Equations Using the Quadratic Formula
- Solving Quadratic Equations with the Quadratic Formula
  - Solve a quadratic equation using the quadratic formula with 2 real solutions
  - Solve a quadratic equation using the quadratic formula with 1 or 0 real solutions
  - Use the discriminant to predict the number of solutions of a quadratic equation

10.4 Solve Quadratic Equations in Quadratic Form
- Solving Equations by Using Quadratic Methods
  - Solve an equation in quadratic form by using substitution
  - Solve an equation in quadratic form with rational or negative exponents by using substitution

10.5 Solve Applications Modeled by Quadratic Equations
- Problem Solving with Quadratic Equations
  - Solve applications modeled by quadratic equations that may require the quadratic formula
  - Solve geometric applications that may require the quadratic formula

10.6 Graph Quadratic Functions Using Properties
- Parabolas and Their Properties
  - Graph a quadratic function by plotting points and determine the direction a parabola opens (*21)
  - Determine the axis of symmetry and vertex of a parabola given a function
  - Determine the intercepts of a parabola given a function
- Graphing Quadratic Functions
  - Graph a quadratic function by finding key points (*42)
  - Determine the minimum or maximum of a quadratic function and use it in applications
10.7 Graph Quadratic Functions Using Transformations
- Transformations of Parabolas
  - Graph a quadratic function using a vertical translation (*22)
  - Graph a quadratic function using a horizontal translation (*23)
  - Graph a quadratic function by compression, stretching, or reflecting (*22)
- Graphing Quadratic Functions Using Transformations
  - Rewrite a quadratic in vertex form and graph it using transformations (*11)
  - Find a quadratic function given its graph

10.8 Solve Quadratic Inequalities
- Solving Quadratic Inequalities
  - Solve a quadratic inequality graphically
  - Solve a quadratic inequality algebraically

Chapter 11: Exponential and Logarithmic Functions
11.1 Finding Composite and Inverse Functions
- Composite Functions
  - Perform a composition of functions
  - Evaluate a composition of functions for a specific value
- One-to-One Functions
  - Determine whether a function is one-to-one given a set of ordered pairs
  - Use the horizontal line test to determine whether a graph represents a one-to-one function
- Inverse Functions
  - Find the inverse of a function given a set of ordered pairs or a graph
  - Verify that two functions are inverses of each other
  - Find the inverse of a function algebraically

11.2 Evaluate and Graph Exponential Functions
- Graphing Exponential Functions
  - Graph an exponential function and understand its properties (*14)
  - Graph an exponential function using transformations (*22)
  - Evaluate an exponential function with base e and understand the natural base
- Applications with Exponential Functions
  - Use the one-to-one property of exponential equations to solve an exponential equation
  - Use the compound interest formula to find the new value of an account
  - Use the continuously compounding interest formula to find the new value of an account
  - Calculate resultant values using exponential growth and decay models

11.3 Evaluate and Graph Logarithmic Functions
- Introduction to Logarithms
  - Convert between exponential and logarithmic form
  - Evaluate a logarithmic function
- Logarithmic Functions and Applications
  - Graph a logarithmic function and understand its properties (*15)
  - Solve a logarithmic equation by rewriting the equation in exponential form
  - Use logarithmic models in applications
11.4 Use the Properties of Logarithms

- Understanding the Properties of Logarithms
  - Use basic properties of logarithms and the inverse properties of logarithms
  - Use the product, quotient, and power properties of logarithms

- Using the Properties of Logarithms
  - Use the properties of logarithms to expand a logarithmic expression
  - Use the properties of logarithms to condense a logarithmic expression
  - Use the change-of-base formula for logarithms

11.5 Solve Exponential and Logarithmic Equations

- Solving Logarithmic Equations
  - Use the one-to-one property of logarithmic equations to solve logarithmic equations
  - Use the properties of logarithms to solve logarithmic equations

- Solving Exponential Equations and Applications
  - Solve exponential equations using logarithms
  - Solve for amounts other than a new balance with the compound or continuously compounding interest formula
  - Use the exponential growth and decay models to find values other than the resultant value

Chapter 12: Conics

12.1 Distance and Midpoint Formulas and Circles

- The Distance and Midpoint Formulas
  - Use the distance formula to find the distance between two points
  - Use the midpoint formula to find the midpoint between two points (*10)

- The Equation of Circles
  - Write the standard form of the equation of a circle given its center and radius
  - Write the standard form of the equation of a circle given its center and a point on the circle
  - Graph a circle given its equation in standard form (*21)
  - Rewrite the equation of a circle given in general form by completing the square (*11)

12.2 Parabolas

- Parabolas as Conic Sections and Applications
  - Graph a vertical parabola given the equation in general or standard form (*24)
  - Graph a horizontal parabola given the equation in general form (*12)
  - Graph a horizontal parabola given the equation in standard form (*21)
  - Solve applications with parabolas

12.3 Ellipses

- Ellipses with Centers at the Origin
  - Graph an ellipse with its center at the origin (*23)
  - Find the equation of an ellipse with its center at the origin

- Ellipses with Centers Not at the Origin and Applications
  - Graph an ellipse with its center not at the origin (*22)
  - Rewrite the equation of an ellipse given in general form by completing the square (*11)
  - Solve applications with ellipses
12.4 Hyperbolas
- Hyperbolas as Conic Sections
  - Graph a hyperbola with its center at the origin (*23)
  - Graph a hyperbola with its center not at the origin (*22)
  - Rewrite the equation of a hyperbola given in general form by completing the square (*11)
- Identifying Conic Sections by Their Equations
  - Identify conic sections by their equations

12.5 Solve Systems of Nonlinear Equations
- Solving Systems of Nonlinear Equations
  - Solve a system of nonlinear equations by graphing
  - Solve a system of nonlinear equations using substitution
  - Solve a system of nonlinear equations using elimination
- Problem Solving with Systems of Nonlinear Equations
  - Use a system of nonlinear equations to solve applications

Chapter 13: Sequences, Series, and the Binomial Theorem
13.1 Sequences
- Introduction to Sequences
  - Write the first few terms of a sequence
  - Find a formula for the general term of a sequence
- Factorial Notation and Sigma Notation
  - Use factorial notation
  - Find the partial sum
  - Use summation notation to write a sum

13.2 Arithmetic Sequences and Series
- Arithmetic Sequences and Series
  - Determine if a sequence is arithmetic and write the first few terms of an arithmetic sequence
  - Find the general term of an arithmetic sequence
  - Find the sum of the first n terms of an arithmetic sequence

13.3 Geometric Sequences and Series
- Geometric Sequences
  - Determine if a sequence is geometric and write the first few terms of a geometric sequence
  - Find the general term of a geometric sequence
- Finite and Infinite Geometric Series and Applications
  - Find the sum of the first n terms of a geometric sequence
  - Find the sum of an infinite geometric series and use infinite geometric series to write a repeating decimal as a fraction
  - Use geometric sequences and series to solve monetary applications including annuities
13.4 Binomial Theorem

- The Binomial Theorem
  - Use Pascal's Triangle to expand a binomial
  - Evaluate a binomial coefficient
  - Use the binomial theorem to expand a binomial