

Integrated Mathematics III

This course covers the topics shown below, **new topics** have been highlighted.
Students navigate learning paths based on their level of readiness.
Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum (503 topics + 995 additional topics)

- Real Numbers (42 topics)
 - Factors and Multiples (3 topics)
 - Greatest common factor of 2 numbers
 - Least common multiple of 2 numbers
 - Least common multiple of 3 numbers
 - The Number Line and Absolute Value (3 topics)
 - Using a calculator to approximate a square root
 - Absolute value of a number
 - Finding all numbers with a given absolute value
 - Operations with Signed Numbers (13 topics)
 - Integer addition: Problem type 1
 - Integer addition: Problem type 2
 - Integer subtraction: Problem type 1
 - Integer subtraction: Problem type 2
 - Integer subtraction: Problem type 3
 - Computing the distance between two integers on a number line
 - Integer multiplication and division
 - Multiplication of 3 or 4 integers
 - Signed fraction addition or subtraction: Basic
 - Signed fraction subtraction involving double negation
 - Signed fraction multiplication: Basic
 - Complex fraction without variables: Problem type 1
 - Signed decimal addition and subtraction
 - Exponents and Order of Operations (3 topics)
 - Exponents and integers: Problem type 1
 - Exponents and signed fractions
 - Order of operations with integers
 - Evaluating Expressions (6 topics)
 - Evaluating an algebraic expression: Whole numbers with two operations
 - Evaluating a formula
 - Evaluating an algebraic expression: Whole numbers with one operation and an exponent
 - Evaluating an algebraic expression: Whole number operations and exponents
 - Evaluating a linear expression: Integer multiplication with addition or subtraction
 - Evaluating a quadratic expression: Integers
 - Properties of Real Numbers (10 topics)
 - Combining like terms: Whole number coefficients
 - Combining like terms: Integer coefficients
 - Combining like terms: Fractional coefficients
 - Combining like terms: Decimal coefficients
 - Distributive property: Whole number coefficients
 - Distributive property: Integer coefficients
 - Distributive property: Fractional coefficients
 - Using distribution and combining like terms to simplify: Univariate
 - Using distribution with double negation and combining like terms to simplify: Multivariate
 - Combining like terms in a quadratic expression
 - Introduction to Perimeter, Area, and Volume (4 topics)
 - Writing algebraic expressions for the perimeter of a figure
 - Word problem involving the area of a rectangle: Problem type 2
 - Volume of a rectangular prism
 - Word problem involving the volume of a rectangular prism
- Linear Equations and Inequalities (63 topics)
 - Linear Equations (15 topics)
 - Additive property of equality with signed fractions

- Multiplicative property of equality with signed fractions
- Additive property of equality with a negative coefficient
- Solving a two-step equation with integers
- Introduction to using substitution to solve a linear equation
- Introduction to solving an equation with parentheses
- Solving a multi-step equation given in fractional form
- Solving a linear equation with several occurrences of the variable: Variables on the same side
- Solving a linear equation with several occurrences of the variable: Variables on both sides
- Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
- Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- Solving a two-step equation with signed fractions
- Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- Writing Expressions and Equations (6 topics)
 - Writing a one-step expression for a real-world situation
 - Translating a phrase into a one-step expression
 - Translating a phrase into a two-step expression
 - Translating a sentence into a one-step equation
 - Writing an equation to represent a proportional relationship
 - Translating a sentence into a multi-step equation
- Applications Involving Linear Equations (8 topics)
 - Writing an equation of the form $Ax + B = C$ to solve a word problem
 - Solving a decimal word problem using a linear equation of the form $Ax + B = C$
 - Solving a word problem with two unknowns using a linear equation
 - Writing an equation to represent a real-world problem: Variable on both sides
 - Solving a word problem with three unknowns using a linear equation
 - Solving a one-step word problem using the formula $d = rt$
 - Finding side lengths of rectangles given one dimension and an area or a perimeter
 - Finding the dimensions of a rectangle given its perimeter and a relationship between sides
- Solving for a Variable and Dimensional Analysis (5 topics)
 - Solving for a variable in terms of other variables using addition or subtraction: Basic
 - Solving for a variable in terms of other variables using multiplication or division: Basic
 - Solving for a variable in terms of other variables using addition or subtraction with division
 - Solving for a variable inside parentheses in terms of other variables
 - Solving for a variable in terms of other variables in a linear equation with fractions
- Proportions and Applications Involving Percents (12 topics)
 - Solving a proportion of the form $x/a = b/c$: Basic
 - Solving a proportion of the form $x/a = b/c$
 - Solving a proportion of the form $(x+a)/b = c/d$
 - Solving a proportion of the form $a/(x+b) = c/x$
 - Introduction to solving a rational equation
 - Solving a rational equation that simplifies to linear: Denominator x
 - Word problem on proportions: Problem type 1
 - Applying the percent equation: Problem type 1
 - Finding the multiplier to give a final amount after a percentage increase or decrease
 - Finding the final amount given the original amount and a percentage increase or decrease
 - Finding the sale price given the original price and percent discount
 - Introduction to compound interest
- Absolute Value Equations (1 topics)
 - Introduction to solving an absolute value equation
- Writing and Graphing Inequalities (3 topics)
 - Translating a sentence into a one-step inequality
 - Writing an inequality for a real-world situation
 - Graphing a linear inequality on the number line
- Linear Inequalities (8 topics)
 - Additive property of inequality with whole numbers
 - Additive property of inequality with integers
 - Multiplicative property of inequality with whole numbers
 - Multiplicative property of inequality with integers
 - Solving a two-step linear inequality with whole numbers
 - Solving a two-step linear inequality: Problem type 1
 - Solving a two-step linear inequality: Problem type 2
 - Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- Applications Involving Linear Inequalities (2 topics)
 - Solving a word problem using a two-step linear inequality

- Solving a decimal word problem using a two-step linear inequality
- Sets and Venn Diagrams (1 topics)
 - Interpreting a Venn diagram of 2 sets
- Compound Inequalities (2 topics)
 - Graphing a compound inequality on the number line
 - Set-builder and interval notation
- The Coordinate Plane and Equations of Lines (25 topics)
 - Ordered Pairs (1 topics)
 - Finding distances between points that share a common coordinate given the graph
 - Tables and Graphs of Lines (9 topics)
 - Table for a linear equation
 - Finding a solution to a linear equation in two variables
 - Graphing a linear equation of the form $y = mx$
 - Graphing a line given its equation in slope-intercept form: Integer slope
 - Graphing a line given its equation in slope-intercept form: Fractional slope
 - Graphing a line given its equation in standard form
 - Graphing a vertical or horizontal line
 - Finding x- and y-intercepts given the graph of a line on a grid
 - Finding x- and y-intercepts of a line given the equation: Basic
 - Slope (2 topics)
 - Finding slope given the graph of a line on a grid
 - Finding slope given two points on a line
 - Equations of Lines (6 topics)
 - Finding the slope and y-intercept of a line given its equation in the form $y = mx + b$
 - Finding the slope and y-intercept of a line given its equation in the form $Ax + By = C$
 - Writing an equation of a line given its slope and y-intercept
 - Finding the slope and y-intercept given a table for a linear function
 - Writing an equation in slope-intercept form given the slope and a point
 - Writing the equation of a line given the y-intercept and another point
 - Applications Involving Linear Equations with Two Variables (7 topics)
 - Writing and evaluating a function that models a real-world situation: Basic
 - Writing a linear equation that models a real-world situation given a graph or a table of values
 - Writing an equation and drawing its graph to model a real-world situation: Advanced
 - Finding the intercepts and rate of change given a graph of a linear function
 - Combining functions to write a new function that models a real-world situation
 - Comparing properties of linear functions given in different forms
 - Interpreting the parameters of a linear function that models a real-world situation
- Functions and Systems (57 topics)
 - Introduction to Functions (8 topics)
 - Identifying functions from relations
 - Domain and range from ordered pairs
 - Table for a linear function
 - Evaluating functions: Linear and quadratic or cubic
 - Variable expressions as inputs of functions: Problem type 1
 - Evaluating a piecewise-defined function
 - Finding outputs of a two-step function with decimals that models a real-world situation: Function notation
 - Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
 - Graphs of Functions (23 topics)
 - Finding an output of a function from its graph
 - Finding inputs and outputs of a function from its graph
 - Finding and interpreting an output of a linear function given a graph that models a real-world situation
 - Interpreting the domain and range of a linear function in context
 - Domain and range from the graph of a continuous function
 - Finding intercepts of a nonlinear function given its graph
 - Finding where a function is increasing, decreasing, or constant given the graph
 - Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
 - Finding local maxima and minima of a function given the graph
 - Finding values and intervals where the graph of a function is zero, positive, or negative
 - Graphing an absolute value equation of the form $y = |x|$
 - Graphing an absolute value equation in the plane: Basic
 - Graphing a parabola of the form $y = ax^2$
 - Graphing a parabola of the form $y = (x-h)^2 + k$
 - Finding the domain and range from the graph of a parabola

- Graphing a cubic function of the form $y = ax^3$
- Graphing a piecewise-defined function: Problem type 1
- Introduction to graphing a piecewise-defined function involving lines with non-zero slope
- Graphing a piecewise-defined function: Problem type 2
- Graphing a piecewise-defined function: Problem type 3
- Finding the average rate of change of a function given its equation
- Finding the average rate of change of a function given its graph
- Word problem involving average rate of change
- Transforming the Graphs of Functions (10 topics)
 - Translating the graph of a parabola: One step
 - Translating the graph of a parabola: Two steps
 - Translating the graph of an absolute value function: One step
 - Translating the graph of an absolute value function: Two steps
 - How the leading coefficient affects the graph of an absolute value function
 - Writing an equation for a function after a vertical translation
 - Translating the graph of a function: One step
 - Translating the graph of a function: Two steps
 - Transforming the graph of a quadratic, cubic, square root, or absolute value function
 - Writing an equation for a function after a vertical and horizontal translation
- Systems of Linear Equations (7 topics)
 - Graphically solving a system of linear equations
 - Using a graphing calculator to solve a system of linear equations: Basic
 - Using a graphing calculator to solve a system of linear equations: Advanced
 - Solving a system of linear equations of the form $y = mx + b$
 - Solving a system of linear equations using substitution
 - Solving a system of linear equations using elimination with addition
 - Solving a system of linear equations using elimination with multiplication and addition
- Applications Involving Systems of Linear Equations (2 topics)
 - Solving a word problem involving a sum and another basic relationship using a system of linear equations
 - Solving a value mixture problem using a system of linear equations
- Linear Inequalities with Two Variables (4 topics)
 - Identifying solutions to a linear inequality in two variables
 - Graphing a linear inequality in the plane: Vertical or horizontal line
 - Graphing a linear inequality in the plane: Slope-intercept form
 - Graphing a linear inequality in the plane: Standard form
- Systems of Linear Inequalities (3 topics)
 - Graphing a system of two linear inequalities: Basic
 - Writing a multi-step inequality for a real-world situation
 - Solving a word problem using a system of linear inequalities: Problem type 1
- Exponents and Polynomials (58 topics)
 - Product, Power, and Quotient Rules (12 topics)
 - Introduction to the product rule of exponents
 - Product rule with positive exponents: Univariate
 - Product rule with positive exponents: Multivariate
 - Introduction to the power of a power rule of exponents
 - Introduction to the power of a product rule of exponents
 - Power rules with positive exponents: Multivariate products
 - Power rules with positive exponents: Multivariate quotients
 - Simplifying a ratio of multivariate monomials: Basic
 - Introduction to the quotient rule of exponents
 - Simplifying a ratio of univariate monomials
 - Quotient of expressions involving exponents
 - Simplifying a ratio of multivariate monomials: Advanced
 - Negative Exponents (5 topics)
 - Evaluating expressions with exponents of zero
 - Evaluating an expression with a negative exponent: Whole number base
 - Evaluating an expression with a negative exponent: Positive fraction base
 - Evaluating an expression with a negative exponent: Negative integer base
 - Rewriting an algebraic expression without a negative exponent
 - Polynomial Addition, Subtraction, and Multiplication (15 topics)
 - Degree and leading coefficient of a univariate polynomial
 - Simplifying a sum or difference of two univariate polynomials
 - Simplifying a sum or difference of multivariate polynomials
 - Multiplying a univariate polynomial by a monomial with a positive coefficient
 - Multiplying a univariate polynomial by a monomial with a negative coefficient

- Multiplying binomials with leading coefficients of 1
- Multiplying binomials with leading coefficients greater than 1
- Multiplying binomials in two variables
- Multiplying conjugate binomials: Univariate
- Multiplying conjugate binomials: Multivariate
- Squaring a binomial: Univariate
- Squaring a binomial: Multivariate
- Multiplying binomials with negative coefficients
- Multiplication involving binomials and trinomials in one variable
- Multiplication involving binomials and trinomials in two variables
- Factoring Using the GCF (3 topics)
 - Factoring a linear binomial
 - Introduction to the GCF of two monomials
 - Factoring out a monomial from a polynomial: Univariate
- Factoring by Grouping (1 topics)
 - Factoring a univariate polynomial by grouping: Problem type 1
- Factoring Quadratic Trinomials (5 topics)
 - Factoring a quadratic with leading coefficient 1
 - Factoring out a constant before factoring a quadratic
 - Factoring a quadratic with leading coefficient greater than 1: Problem type 1
 - Factoring a quadratic with leading coefficient greater than 1: Problem type 2
 - Factoring a quadratic with a negative leading coefficient
- Factoring Special Products (3 topics)
 - Factoring a perfect square trinomial with leading coefficient 1
 - Factoring a difference of squares in one variable: Basic
 - Factoring a difference of squares in one variable: Advanced
- Polynomial Division (6 topics)
 - Dividing a polynomial by a monomial: Univariate
 - Polynomial long division: Problem type 1
 - Polynomial long division: Problem type 2
 - Polynomial long division: Problem type 3
 - Synthetic division
 - Closure properties of integers and polynomials
- Solving Quadratic Equations by Factoring (8 topics)
 - Solving an equation written in factored form
 - Finding the roots of a quadratic equation with leading coefficient 1
 - Finding the roots of a quadratic equation with leading coefficient greater than 1
 - Solving a quadratic equation needing simplification
 - Roots of a product of polynomials
 - Writing a quadratic equation given the roots and the leading coefficient
 - Finding the zeros of a quadratic function given its equation
 - Solving a word problem using a quadratic equation with rational roots
- Radicals (33 topics)
 - Roots of Perfect Powers (3 topics)
 - Square root of a rational perfect square
 - Square roots of perfect squares with signs
 - Cube root of an integer
 - Radical Functions (7 topics)
 - Table for a square root function
 - Evaluating a cube root function
 - Domain of a square root function: Basic
 - Domain of a square root function: Advanced
 - Graphing a square root function: Problem type 1
 - Graphing a square root function: Problem type 2
 - Graphing a cube root function
 - Simplifying Expressions (2 topics)
 - Simplifying the square root of a whole number less than 100
 - Simplifying a higher root of a whole number
 - Multiplication (3 topics)
 - Introduction to square root multiplication
 - Square root multiplication: Basic
 - Square root multiplication: Advanced

- Division and Rationalization (2 topics)
 - Simplifying a quotient of square roots
 - Rationalizing a denominator: Quotient involving square roots
- Radical Equations (13 topics)
 - Introduction to solving a radical equation
 - Solving a radical equation that simplifies to a linear equation: One radical, basic
 - Solving a radical equation that simplifies to a linear equation: One radical, advanced
 - Solving a radical equation that simplifies to a linear equation: Two radicals
 - Solving a radical equation that simplifies to a quadratic equation: One radical, basic
 - Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
 - Solving for a variable in terms of other variables in an equation involving radicals
 - Word problem involving radical equations: Basic
 - Word problem involving radical equations: Advanced
 - Solving an equation with a root index greater than 2: Problem type 1
 - Solving an equation with a root index greater than 2: Problem type 2
 - Solving an equation of the form $x^3 = a$ using integers
 - Finding the side length of a cube given its volume
- Complex Numbers (3 topics)
 - Using i to rewrite square roots of negative numbers
 - Adding or subtracting complex numbers
 - Multiplying complex numbers
- Rational Expressions (47 topics)
 - Simplifying Rational Expressions (9 topics)
 - Restriction on a variable in a denominator: Linear
 - Restriction on a variable in a denominator: Quadratic
 - Evaluating a rational function: Problem type 1
 - Evaluating a rational function: Problem type 2
 - Domain of a rational function: Excluded values
 - Simplifying a ratio of factored polynomials: Linear factors
 - Simplifying a ratio of polynomials using GCF factoring
 - Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
 - Simplifying a ratio of polynomials: Problem type 1
 - Multiplication and Division (6 topics)
 - Multiplying rational expressions involving multivariate monomials
 - Multiplying rational expressions involving linear expressions
 - Multiplying rational expressions involving quadratics with leading coefficients of 1
 - Dividing rational expressions involving multivariate monomials
 - Dividing rational expressions involving linear expressions
 - Dividing rational expressions involving quadratics with leading coefficients of 1
 - Addition and Subtraction (10 topics)
 - Finding the LCD of rational expressions with linear denominators: Relatively prime
 - Adding rational expressions with common denominators and monomial numerators
 - Adding rational expressions with common denominators and binomial numerators
 - Adding rational expressions with common denominators and GCF factoring
 - Adding rational expressions with common denominators and quadratic factoring
 - Adding rational expressions with different denominators and a single occurrence of a variable
 - Adding rational expressions with denominators ax and bx : Basic
 - Adding rational expressions with linear denominators without common factors: Basic
 - Adding rational expressions with linear denominators with common factors: Basic
 - Adding rational expressions involving different quadratic denominators
 - Complex Fractions (2 topics)
 - Complex fraction without variables: Problem type 2
 - Complex fraction involving univariate monomials
 - Rational Equations (10 topics)
 - Solving a rational equation that simplifies to linear: Denominator $x+a$
 - Solving a rational equation that simplifies to linear: Denominators a , x , or ax
 - Solving a rational equation that simplifies to linear: Denominators ax and bx
 - Solving a rational equation that simplifies to linear: Like binomial denominators
 - Solving a rational equation that simplifies to linear: Unlike binomial denominators
 - Solving a rational equation that simplifies to linear: Factorable quadratic denominator
 - Solving a rational equation that simplifies to quadratic: Denominator x
 - Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
 - Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
 - Solving a rational equation that simplifies to quadratic: Factorable quadratic denominator
 - Applications (5 topics)

- Solving for a variable in terms of other variables in a rational equation: Problem type 1
- Solving for a variable in terms of other variables in a rational equation: Problem type 2
- Word problem involving multiple rates
- Solving a work problem using a rational equation
- Solving a distance, rate, time problem using a rational equation
- Graphing Rational Functions (5 topics)
 - Finding the intercepts, asymptotes, domain, and range from the graph of a rational function
 - Finding the asymptotes of a rational function: Constant over linear
 - Graphing a rational function: Constant over linear
 - Graphing a rational function: Linear over linear
 - Transforming the graph of a rational function
- Quadratic, Exponential, and Logarithmic Functions (82 topics)
 - Quadratic Equations (7 topics)
 - Solving an equation of the form $x^2 = a$ using the square root property
 - Solving a quadratic equation using the square root property: Exact answers, basic
 - Solving a quadratic equation using the square root property: Exact answers, advanced
 - Completing the square
 - Applying the quadratic formula: Exact answers
 - Solving a quadratic equation with complex roots
 - Solving a word problem using a quadratic equation with irrational roots
 - Quadratic Functions (15 topics)
 - Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
 - Graphing a parabola of the form $y = a(x-h)^2 + k$
 - Graphing a parabola of the form $y = x^2 + bx + c$
 - Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
 - Writing a quadratic function given its zeros
 - Finding the x-intercept(s) and the vertex of a parabola
 - Rewriting a quadratic function to find its vertex and sketch its graph
 - Rewriting a quadratic function to find its maximum or minimum and axis of symmetry
 - Finding the maximum or minimum of a quadratic function
 - Word problem involving the maximum or minimum of a quadratic function
 - Graphing a quadratic function that models a real-world situation and identifying key features
 - Writing the equation of a quadratic function given a table of values
 - Writing the equation of a quadratic function given its x-intercepts and another point
 - Writing the equation of a quadratic function given its graph
 - Comparing properties of quadratic functions given in different forms
 - Function Operations (4 topics)
 - Sum, difference, and product of two functions
 - Quotient of two functions: Basic
 - Introduction to the composition of two functions
 - Composition of two functions: Basic
 - Inverse Functions (6 topics)
 - Inverse functions: Linear, discrete
 - Inverse functions: Quadratic, square root
 - Inverse functions: Cubic, cube root
 - Inverse functions: Rational
 - Finding, evaluating, and interpreting an inverse function for a given linear relationship
 - Even and odd functions: Problem type 1
 - Graphing Exponential Functions (9 topics)
 - Table for an exponential function
 - Graphing an exponential function: $f(x) = b^x$
 - Graphing an exponential function and its asymptote: $f(x) = b^x$
 - Graphing an exponential function and its asymptote: $f(x) = a(b)^x$
 - Graphing an exponential function and its asymptote: $f(x) = b^{-x}$ or $f(x) = -b^x$ or $f(x) = -b^{-x}$
 - Translating the graph of an exponential function
 - Finding domain and range from the graph of an exponential function
 - Choosing the graph for an exponential function and identifying key features
 - Graphing an exponential function and finding its domain and range
 - Applications of Exponential Functions (8 topics)
 - Using a calculator to evaluate exponential expressions
 - Evaluating an exponential function that models a real-world situation
 - Using a calculator to evaluate exponential expressions involving base e
 - Finding a final amount in a word problem on exponential growth or decay
 - Finding the initial amount and rate of change given an exponential function

- Writing an equation that models exponential growth or decay
- Writing an exponential function rule given a table of ordered pairs
- Finding the initial amount and asymptote given a graph of an exponential function
- Polynomial Functions (9 topics)
 - Identifying polynomial functions
 - Finding zeros of a polynomial function written in factored form
 - Finding zeros and their multiplicities given a polynomial function written in factored form
 - Finding a polynomial of a given degree with given zeros: Real zeros
 - Finding x- and y-intercepts given a polynomial function
 - Determining the end behavior of the graph of a polynomial function
 - Determining end behavior and intercepts to graph a polynomial function
 - Using a graphing calculator to find local extrema of a polynomial function
 - Using a graphing calculator to solve a word problem involving a local extremum of a polynomial function
- Remainder and Factor Theorems (2 topics)
 - Using the remainder theorem to evaluate a polynomial
 - The Factor Theorem
- Complex Zeros of Polynomial Functions (4 topics)
 - Multiplying expressions involving complex conjugates
 - Finding a polynomial of a given degree with given zeros: Complex zeros
 - Using the conjugate zeros theorem to find all zeros of a polynomial
 - Linear factors theorem and conjugate zeros theorem
- Logarithmic Functions (6 topics)
 - Using a calculator to evaluate natural and common logarithmic expressions
 - Converting between logarithmic and exponential equations
 - Converting between natural logarithmic and exponential equations
 - Evaluating logarithmic expressions
 - Translating the graph of a logarithmic function
 - Graphing a logarithmic function: Basic
- Properties of Logarithms (2 topics)
 - Basic properties of logarithms
 - Expanding a logarithmic expression: Problem type 1
- Logarithmic and Exponential Equations and Applications (10 topics)
 - Solving an exponential equation by using logarithms: Decimal answers, basic
 - Solving an exponential equation by using natural logarithms: Decimal answers
 - Solving an exponential equation by using logarithms: Decimal answers, advanced
 - Solving an exponential equation by using logarithms: Exact answers in logarithmic form
 - Using a graphing calculator to solve an exponential or logarithmic equation
 - Finding the time to reach a limit in a word problem on exponential growth or decay
 - Finding the time given an exponential function with base e that models a real-world situation
 - Finding the final amount in a word problem on continuous compound interest
 - Finding the final amount in a word problem on continuous exponential growth or decay
 - Finding the rate or time in a word problem on continuous exponential growth or decay
- Angles, Triangles, and Quadrilaterals (4 topics)
 - Angles of Triangles (1 topics)
 - Finding an angle measure of a triangle given two angles
 - The Pythagorean Theorem (3 topics)
 - Introduction to the Pythagorean Theorem
 - Pythagorean Theorem
 - Word problem involving the Pythagorean Theorem in three dimensions
- Area, Volume, and Circles (8 topics)
 - Areas of Parallelograms and Triangles (2 topics)
 - Area of a triangle
 - Word problem on population density
 - Circumferences and Areas of Circles (1 topics)
 - Circumference of a circle
 - Solids and Cross Sections (3 topics)
 - Identifying geometric shapes that model real-world objects
 - Identifying horizontal and vertical cross sections of solids
 - Identifying solids generated by rotations of two-dimensional regions
 - Volumes of Prisms and Cylinders (2 topics)

- Computations involving density, mass, and volume
- Word problem on density involving the volume of a rectangular solid
- Sequences, Probability, and Conic Sections (53 topics)
 - Evaluating Sequences (2 topics)
 - Finding the first terms of an arithmetic sequence using an explicit rule
 - Finding the first terms of a geometric sequence using an explicit rule
 - Arithmetic Sequences and Series (3 topics)
 - Finding the next terms of an arithmetic sequence with integers
 - Finding a specified term of an arithmetic sequence given the first terms
 - Finding a specified term of an arithmetic sequence given the common difference and first term
 - Geometric Sequences and Series (5 topics)
 - Finding the next terms of a geometric sequence with signed numbers
 - Identifying geometric sequences and finding the common ratio
 - Finding a specified term of a geometric sequence given the first terms
 - Finding a specified term of a geometric sequence given the common ratio and first term
 - Sum of the first n terms of a geometric sequence
 - Collecting and Displaying Data (7 topics)
 - Differentiating between parameters and statistics
 - Choosing an appropriate method for gathering data: Problem type 1
 - Choosing an appropriate method for gathering data: Problem type 2
 - [Understanding the differences between designed experiments and observational studies](#) NEW
 - Introduction to expectation
 - Constructing a two-way frequency table: Basic
 - Constructing a frequency distribution and a histogram
 - Measures of Center and Spread (11 topics)
 - Mode of a data set
 - Range of a data set
 - Finding the value for a new score that will yield a given mean
 - Rejecting unreasonable claims based on average statistics
 - Mean and median of a data set
 - How changing a value affects the mean and median
 - Mean, median, and mode: Comparisons
 - Approximating the mean of a data set given a frequency distribution
 - Approximating the mean of a data set given a histogram
 - Percentage of data below a specified value
 - Population standard deviation
 - Counting (3 topics)
 - Factorial expressions
 - Computing permutations and combinations
 - Binomial formula
 - Probability of Simple Events (7 topics)
 - Determining a sample space and outcomes for an event: Experiment involving a single selection
 - Introduction to the probability of an event
 - Probability involving one die or choosing from n distinct objects
 - Probability involving choosing from objects that are not distinct
 - Experimental and theoretical probability
 - Computing expected value in a game of chance
 - Computing expected value in a business application
 - Probability of Compound Events (5 topics)
 - Determining a sample space and outcomes for an event: Experiment involving multiple selections
 - Outcomes and event probability
 - Determining outcomes for unions, intersections, and complements of events
 - Computing conditional probability using a sample space
 - Computing conditional probability to make an inference using a two-way frequency table
 - Simulations (2 topics)
 - Generating random samples from a population with known characteristics
 - Using a random number table to make a fair decision
 - The Normal Distribution (7 topics)
 - Using the graph of a distribution to find probabilities: Basic
 - Using the empirical rule to identify values and percentages of a normal distribution
 - Word problem involving calculations from a normal distribution
 - Shading a region and finding its standard normal probability
 - Computing standard normal probabilities

- Finding a z-score for a given data value
 - Finding a probability given a normal distribution: Basic
- Nonlinear Systems (1 topics)
 - Using a graphing calculator to solve a nonlinear system of equations: Basic
- Trigonometry (31 topics)
 - Right Triangle Trigonometry (7 topics)
 - Sine, cosine, and tangent ratios: Numbers for side lengths
 - Using a calculator to approximate sine, cosine, and tangent values
 - Using a trigonometric ratio to find a side length in a right triangle
 - Using trigonometry to find a length in a word problem with one right triangle
 - Using a trigonometric ratio to find an angle measure in a right triangle
 - Using trigonometry to find angles of elevation or depression in a word problem
 - Solving a right triangle
 - Angles and Their Measure (2 topics)
 - Converting between degree and radian measure: Problem type 1
 - Sketching an angle with absolute value less than 2π radians in standard position
 - The Unit Circle (3 topics)
 - Finding coordinates on the unit circle for special angles
 - Trigonometric functions and special angles: Problem type 1
 - Trigonometric functions and special angles: Problem type 2
 - Laws of Sines and Cosines (9 topics)
 - Solving a triangle with the law of sines: Problem type 1
 - Solving a triangle with the law of sines: Problem type 2
 - Solving a word problem using the law of sines
 - Proving the law of sines
 - Solving a triangle with the law of cosines
 - Proving the law of cosines
 - Solving a word problem using the law of cosines
 - Using trigonometry to find the area of a right triangle
 - Expressing the area of a triangle in terms of the sine of one of its angles
 - Graphs of Sine and Cosine Functions (8 topics)
 - Sketching the graph of $y = a \sin(x)$ or $y = a \cos(x)$
 - Sketching the graph of $y = \sin(bx)$ or $y = \cos(bx)$
 - Sketching the graph of $y = \sin(x) + d$ or $y = \cos(x) + d$
 - Sketching the graph of $y = \sin(x+c)$ or $y = \cos(x+c)$
 - Sketching the graph of $y = a \sin(x+c)$ or $y = a \cos(x+c)$
 - Sketching the graph of $y = a \sin(bx)$ or $y = a \cos(bx)$
 - Amplitude and period of a sine or cosine function
 - Word problem involving a sine or cosine function: Problem type 1
 - Graphs of Other Trigonometric Functions (2 topics)
 - Sketching the graph of a secant or cosecant function: Problem type 1
 - Sketching the graph of a tangent or cotangent function: Problem type 1
- Other Topics Available(*) (995 additional topics)
 - Real Numbers (28 topics)
 - Greatest common factor of 3 numbers
 - Plotting integers on a number line
 - Ordering integers
 - Square root of a perfect square
 - Addition and subtraction with 3 integers
 - Operations with absolute value: Problem type 1
 - Signed decimal multiplication
 - Exponents and integers: Problem type 2
 - Converting between temperatures in Fahrenheit and Celsius
 - Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
 - Identifying numbers as integers or non-integers
 - Identifying numbers as rational or irrational
 - Properties of addition
 - Properties of real numbers
 - Finding the missing length in a figure
 - Area of a piecewise rectangular figure
 - Area between two rectangles
 - Word problem involving the area between two rectangles
 - U.S. Customary length conversion with whole number values

- Word problem involving a U.S. Customary length conversion
- U.S. Customary volume conversion with whole number values
- U.S. Customary weight conversions with whole number values
- U.S. Customary area unit conversion with whole number values
- Word problem on area involving conversions of U.S. Customary units: Problem type 1
- Metric distance conversion with whole number values
- Time unit conversion with whole number values
- Converting between metric and U.S. Customary unit systems
- Conversions with currency
- Linear Equations and Inequalities (76 topics)
 - Additive property of equality with integers
 - Multiplicative property of equality with integers
 - Using two steps to solve an equation with whole numbers
 - Solving a two-step equation with signed decimals
 - Identifying properties used to solve a linear equation
 - Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
 - Clearing fractions in an equation
 - Solving equations with zero, one, or infinitely many solutions
 - Writing an equation of the form $A(x + B) = C$ to solve a word problem
 - Writing a multi-step equation for a real-world situation
 - Solving a decimal word problem using a linear equation with the variable on both sides
 - Solving a word problem involving consecutive integers
 - Solving a value mixture problem using a linear equation
 - Solving a word problem involving rates and time conversion
 - Solving a distance, rate, time problem using a linear equation
 - Word problem on optimizing an area or perimeter
 - Finding the perimeter or area of a rectangle given one of these values
 - Finding a side length given the perimeter and side lengths with variables
 - Solving for a variable in terms of other variables using addition or subtraction: Advanced
 - Solving for a variable in terms of other variables using multiplication or division: Advanced
 - U.S. Customary length conversions involving dimensional analysis
 - Converting between metric and U.S. Customary unit systems using dimensional analysis: U.S. Customary to metric
 - [Converting between metric and U.S. Customary unit systems using dimensional analysis: Metric to U.S. Customary](#) NEW
 - Converting between compound units: Basic
 - Word problem involving U.S. Customary length conversions using dimensional analysis
 - Converting between compound units: Advanced
 - Word problem involving conversion between compound units using dimensional analysis
 - Word problem on proportions: Problem type 2
 - Finding the total cost including tax or markup
 - Finding the absolute error and percent error of a measurement
 - Solving a percent mixture problem using a linear equation
 - Finding simple interest without a calculator
 - Finding the interest and future value of a simple interest loan or investment
 - Solving an absolute value equation: Problem type 1
 - Solving an absolute value equation: Problem type 2
 - Solving an absolute value equation: Problem type 3
 - Solving an absolute value equation: Problem type 4
 - Solving an absolute value equation of the form $|ax + b| = |cx + d|$
 - Writing an absolute value equation to solve a word problem and describing the solution
 - Translating a sentence by using an inequality symbol
 - Writing an inequality given a graph on the number line
 - Additive property of inequality with signed fractions
 - Multiplicative property of inequality with signed fractions
 - Solving a two-step linear inequality with a fractional coefficient
 - Solving a linear inequality with multiple occurrences of the variable: Problem type 2
 - Solving a linear inequality with multiple occurrences of the variable: Problem type 3
 - Solving inequalities with no solution or all real numbers as solutions
 - Translating a sentence into a multi-step inequality
 - Solving a word problem using a two-step linear inequality and describing the solution
 - Solving a decimal word problem using a linear inequality with the variable on both sides
 - Writing sets of natural numbers using set-builder and roster forms
 - Writing sets of integers using set-builder and roster forms
 - Constructing a Venn diagram with 2 sets
 - Interpreting Venn diagram cardinalities with 2 sets for a real-world situation
 - Constructing a Venn diagram with 2 sets to solve a word problem
 - Interpreting a Venn diagram of 3 sets
 - Constructing a Venn diagram with 3 sets
 - Interpreting Venn diagram cardinalities with 3 sets for a real-world situation
 - Constructing a Venn diagram with 3 sets to solve a word problem
 - Union and intersection of finite sets
 - Introduction to shading a Venn diagram with 2 events
 - Shading a Venn diagram with 2 events: Unions, intersections, and complements
 - Translating a sentence into a compound inequality

- Writing a compound inequality given a graph on the number line
 - Solving a compound linear inequality: Graph solution, basic
 - Solving a compound linear inequality: Graph solution, advanced
 - Solving and graphing the solution to a compound inequality that models a real-world situation
 - Union and intersection of intervals
 - Solving a compound linear inequality: Interval notation
 - Solving an absolute value inequality: Problem type 1
 - Writing an absolute value inequality given a graph on the number line
 - Solving an absolute value inequality: Problem type 2
 - Solving an absolute value inequality: Problem type 3
 - Solving an absolute value inequality: Problem type 4
 - Solving an absolute value inequality: Problem type 5
 - Writing and solving an absolute value inequality that models a real-world situation and interpreting the solution
- The Coordinate Plane and Equations of Lines (60 topics)
- Reading a point in the coordinate plane
 - Plotting a point in the coordinate plane
 - Naming the quadrant or axis of a point given its graph
 - Naming the quadrant or axis of a point given its coordinates
 - Naming the quadrant or axis of a point given the signs of its coordinates
 - Finding distances between points that share a common coordinate given their coordinates
 - Finding the coordinates of a point on a graph given the equation
 - Finding x- and y-intercepts of a line given the equation: Advanced
 - Graphing a line given its x- and y-intercepts
 - Graphing a line by first finding its x- and y-intercepts
 - Finding slope given the graph of a line in quadrant 1 that models a real-world situation
 - Classifying slopes given graphs of lines
 - Finding the slopes of horizontal and vertical lines
 - Finding the coordinate that yields a given slope
 - Graphing a line given its slope and y-intercept
 - Graphing a line through a given point with a given slope
 - [Deriving the slope formula](#) NEW
 - Identifying linear equations: Basic
 - Identifying linear equations: Advanced
 - Identifying linear functions given ordered pairs
 - Rewriting a linear equation in the form $Ax + By = C$
 - Graphing a line by first finding its slope and y-intercept
 - Writing an equation and graphing a line given its slope and y-intercept
 - Finding the slope, y-intercept, and equation for a linear function given a table of values
 - Finding the slope and a point on a line given its equation in point-slope form
 - Graphing a line given its equation in point-slope form
 - Writing the equation of a line in point-slope form given the slope and a point
 - Writing the equation of a line in standard form given the slope and a point
 - Writing the equation of a line through two given points
 - Writing the equations of vertical and horizontal lines through a given point
 - Comparing linear functions to the parent function $y = x$
 - [Deriving the equation of a line through the origin](#) NEW
 - [Deriving the equation of a line not going through the origin](#) NEW
 - Writing the equation and finding the slope of a line parallel or perpendicular to a vertical or horizontal line
 - Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
 - Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
 - Identifying parallel and perpendicular lines from equations
 - Writing equations of lines parallel and perpendicular to a given line through a point
 - Identifying parallel and perpendicular lines from coordinates
 - Writing and evaluating a function that models a real-world situation: Advanced
 - Writing an equation and drawing its graph to model a real-world situation: Basic
 - Finding the initial amount and rate of change given a table for a linear function
 - Finding the initial amount and rate of change given two points for a linear function
 - [Graphing a linear function that models a simple interest situation and identifying key features](#) NEW
 - Application problem with a linear function: Finding a coordinate given the slope and a point
 - Application problem with a linear function: Finding a coordinate given two points
 - Constructing a scatter plot
 - Sketching the line of best fit
 - Scatter plots and correlation
 - Predictions from the line of best fit
 - Approximating the equation of a line of best fit and making predictions
 - [Using technology to fit a linear regression model to data and to make a prediction](#) NEW
 - Computing residuals
 - Interpreting residual plots
 - Classifying linear and nonlinear relationships from scatter plots
 - Linear relationship and the correlation coefficient
 - [Using technology to calculate the correlation coefficients for two sets of bivariate data to compare the linear relationships](#) NEW

- Linear relationship and the sample correlation coefficient NEW
- Identifying outliers and clustering in scatter plots
- Identifying correlation and causation
- Functions and Systems (78 topics)
 - Identifying functions given a verbal description NEW
 - Vertical line test
 - Finding outputs of a one-step function that models a real-world situation: Function notation
 - Domain and range of a linear function that models a real-world situation
 - Domain and range from the graph of a discrete relation
 - Finding domain and range from a linear graph in context
 - Domain and range from the graph of a piecewise function
 - Choosing a graph to fit a narrative: Basic
 - Choosing a graph to fit a narrative: Advanced
 - Drawing a graph to fit a narrative
 - Graphing an integer function and finding its range for a given domain
 - Graphing a function of the form $f(x) = ax + b$: Integer slope
 - Graphing a function of the form $f(x) = ax + b$: Fractional slope
 - Graphing an absolute value equation in the plane: Advanced
 - Determining if a function is linear given its graph
 - Graphing a parabola of the form $y = ax^2 + c$
 - Graphing a function of the form $f(x) = ax^2$
 - Graphing a function of the form $f(x) = ax^2 + c$
 - Classifying function types given graphs of functions: Linear, exponential, and quadratic
 - Classifying function types given graphs of functions: Absolute value, cubic, square root, and cubic root NEW
 - Classifying function types given equations of functions: Problem type 1 NEW
 - Classifying function types given equations of functions: Problem type 2 NEW
 - How the leading coefficient affects the shape of a parabola
 - Graphing quadratic functions of the form $y = ax^2$ and $y = (bx)^2$ by transforming the parent graph $y = x^2$
 - Transforming the graph of a function by reflecting over an axis
 - Transforming the graph of a function by shrinking or stretching
 - Transforming the graph of a function using more than one transformation
 - Classifying systems of linear equations from graphs
 - Writing a system of linear equations given its graph
 - Solving a system of linear equations with fractional coefficients
 - Solving a system of linear equations with decimal coefficients
 - Solving systems of linear equations with 0, 1, or infinitely many solutions
 - Solving a 2x2 system of linear equations that is inconsistent or consistent dependent
 - Creating an inconsistent system of linear equations
 - Introduction to solving a 3x3 system of linear equations
 - Solving a 3x3 system of linear equations: Problem type 1
 - Solving a 3x3 system of linear equations: Problem type 2
 - Solving a 3x3 system of linear equations that is inconsistent or consistent dependent
 - Scalar multiplication of a matrix
 - Addition or subtraction of matrices
 - Linear combination of matrices
 - Squaring and multiplying 2x2 matrices
 - Multiplication of matrices: Basic
 - Multiplication of matrices: Advanced
 - Word problem involving multiplication of matrices
 - Completing Gauss-Jordan elimination with a 2x2 matrix
 - Gauss-Jordan elimination with a 2x2 matrix
 - Completing Gauss-Jordan elimination with a 3x3 matrix
 - Writing solutions to 3x3 systems of linear equations from augmented matrices
 - Solving a system of linear equations given its augmented matrix
 - Finding the inverse of a 2x2 matrix
 - Finding the inverse of a 3x3 matrix
 - Finding the inverse of a matrix to solve a 2x2 system of linear equations
 - Using the inverse of a matrix to solve a 3x3 system of linear equations
 - Finding the determinant of a 2x2 matrix
 - Finding the determinant of a 3x3 matrix
 - Using Cramer's rule to solve a 2x2 system of linear equations
 - Using Cramer's rule to solve a 3x3 system of linear equations
 - Interpreting the graphs of two functions
 - Solving a word problem involving a system of linear equations by graphing and estimating a solution
 - Solving a word problem using a system of linear equations of the form $Ax + By = C$
 - Writing and solving a system of two linear equations given a table of values
 - Writing and solving a system of two linear equations given a verbal description NEW
 - Solving a word problem using a system of linear equations of the form $y = mx + b$
 - Solving a percent mixture problem using a system of linear equations
 - Solving a distance, rate, time problem using a system of linear equations
 - Solving a tax rate or interest rate problem using a system of linear equations
 - Solving a word problem using a 3x3 system of linear equations: Problem type 1

- Solving a word problem using a 3x3 system of linear equations: Problem type 2
- Writing an inequality given its graph in the plane: Horizontal or vertical boundary line
- Writing an inequality given its graph in the plane: Slanted boundary line
- Graphing a system of two linear inequalities: Advanced
- Graphing a system of three linear inequalities
- Writing a linear inequality in two variables given a table of values
- Solving a word problem using a system of linear inequalities: Problem type 2
- Writing a system of linear inequalities that models a real-world situation and determining possible solutions
- Linear programming
- Solving a word problem using linear programming
- Exponents and Polynomials (40 topics)
 - Understanding the product rule of exponents
 - Ordering numbers with positive exponents
 - Understanding the power rules of exponents
 - Power and product rules with positive exponents
 - Power and quotient rules with positive exponents
 - Ordering numbers with negative exponents
 - Introduction to the product rule with negative exponents
 - Product rule with negative exponents
 - Quotient rule with negative exponents: Problem type 1
 - Quotient rule with negative exponents: Problem type 2
 - Power of a power rule with negative exponents
 - Power rules with negative exponents
 - Power and quotient rules with negative exponents: Problem type 1
 - Power and quotient rules with negative exponents: Problem type 2
 - Power, product, and quotient rules with negative exponents
 - Degree of a multivariate polynomial
 - Simplifying a sum or difference of three univariate polynomials
 - Multiplying a multivariate polynomial by a monomial
 - Greatest common factor of three univariate monomials
 - Greatest common factor of two multivariate monomials
 - Factoring out a monomial from a polynomial: Multivariate
 - Factoring out a binomial from a polynomial: GCF factoring, basic
 - Factoring a univariate polynomial by grouping: Problem type 2
 - Factoring a multivariate polynomial by grouping: Problem type 1
 - Factoring a multivariate polynomial by grouping: Problem type 2
 - Factoring a quadratic in two variables with leading coefficient 1
 - Factoring a quadratic with leading coefficient greater than 1: Problem type 3
 - Factoring a quadratic by the ac-method
 - Factoring a quadratic in two variables with leading coefficient greater than 1
 - Factoring a perfect square trinomial with leading coefficient greater than 1
 - Factoring a perfect square trinomial in two variables
 - Factoring a difference of squares in two variables
 - Factoring a polynomial involving a GCF and a difference of squares: Univariate
 - Factoring a polynomial involving a GCF and a difference of squares: Multivariate
 - Factoring a product of a quadratic trinomial and a monomial
 - Factoring with repeated use of the difference of squares formula
 - Factoring a sum or difference of two cubes
 - Dividing a polynomial by a monomial: Multivariate
 - Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$
 - Writing and solving a quadratic equation for a real-world problem involving area or volume
- Radicals (67 topics)
 - Square roots of integers raised to even exponents
 - Introduction to simplifying a radical expression with an even exponent
 - Square root of a perfect square monomial
 - Using absolute value to simplify square roots of perfect square monomials
 - Finding n^{th} roots of perfect n^{th} powers with signs
 - Finding the n^{th} root of a perfect n^{th} power fraction
 - Finding the n^{th} root of a perfect n^{th} power monomial
 - Using absolute value to simplify higher radical expressions
 - Domains of higher root functions
 - Graphing a square root function: Problem type 3
 - Converting between radical form and exponent form
 - Using the properties of integer exponents to define rational exponents
 - Rational exponents: Unit fraction exponents and whole number bases
 - Rational exponents: Unit fraction exponents and bases involving signs
 - Rational exponents: Non-unit fraction exponent with a whole number base
 - Rational exponents: Negative exponents and fractional bases
 - Rational exponents: Product rule
 - Rational exponents: Quotient rule
 - Rational exponents: Products and quotients with negative exponents

- Rational exponents: Power of a power rule
- Rational exponents: Powers of powers with negative exponents
- Simplifying the square root of a whole number greater than 100
- Simplifying a radical expression with an even exponent
- Introduction to simplifying a radical expression with an odd exponent
- Simplifying a radical expression with an odd exponent
- Simplifying a radical expression with two variables
- Introduction to simplifying a higher radical expression
- Simplifying a higher radical expression: Univariate
- Simplifying a higher radical expression: Multivariate
- Introduction to square root addition or subtraction
- Square root addition or subtraction
- Square root addition or subtraction with three terms
- Introduction to simplifying a sum or difference of radical expressions: Univariate
- Simplifying a sum or difference of radical expressions: Univariate
- Simplifying a sum or difference of radical expressions: Multivariate
- Simplifying a sum or difference of higher roots
- Simplifying a sum or difference of higher radical expressions
- Introduction to simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Multivariate
- Introduction to simplifying a product of higher roots
- Simplifying a product of higher radical expressions
- Introduction to simplifying a product involving square roots using the distributive property
- Simplifying a product involving square roots using the distributive property: Basic
- Simplifying a product involving square roots using the distributive property: Advanced
- Special products of radical expressions: Conjugates and squaring
- Classifying sums and products as rational or irrational
- Simplifying a quotient involving a sum or difference with a square root
- Rationalizing a denominator: Square root of a fraction
- Rationalizing a denominator: Quotient involving a monomial
- Rationalizing a denominator using conjugates: Integer numerator
- Rationalizing a denominator using conjugates: Square root in numerator
- Rationalizing a denominator using conjugates: Variable in denominator
- Rationalizing a denominator: Quotient involving a higher radical
- Rationalizing a denominator: Quotient involving higher radicals and monomials
- Simplifying products or quotients of higher radicals with different indices: Univariate
- Simplifying products or quotients of higher radicals with different indices: Multivariate
- Solving a radical equation with a quadratic expression under the radical
- Solving a radical equation with two radicals that simplifies to $\sqrt{x} = a$
- Solving a radical equation that simplifies to a quadratic equation: Two radicals
- Solving an equation using the odd-root property: Problem type 1
- Solving an equation using the odd-root property: Problem type 2
- Solving an equation with exponent $1/a$: Problem type 1
- Solving an equation with exponent $1/a$: Problem type 2
- Simplifying a product and quotient involving square roots of negative numbers
- Dividing complex numbers
- Simplifying a power of i
- Rational Expressions (63 topics)
 - Evaluating functions: Absolute value, rational, radical
 - Variable expressions as inputs of functions: Problem type 2
 - Simplifying a ratio of factored polynomials: Factors with exponents
 - Simplifying a ratio of linear polynomials: 1, -1, and no simplification
 - Simplifying a ratio of polynomials: Problem type 2
 - Simplifying a ratio of polynomials: Problem type 3
 - Simplifying a ratio of multivariate polynomials
 - Multiplying rational expressions involving quadratics with leading coefficients greater than 1
 - Multiplying rational expressions involving multivariate quadratics
 - Dividing rational expressions involving quadratics with leading coefficients greater than 1
 - Dividing rational expressions involving multivariate quadratics
 - Multiplication and division of 3 rational expressions
 - Simplifying a product of radical expressions: Multivariate, fractional expressions
 - Introduction to the LCM of two monomials
 - Least common multiple of two monomials
 - Finding the LCD of rational expressions with linear denominators: Common factors
 - Finding the LCD of rational expressions with quadratic denominators
 - Writing equivalent rational expressions with monomial denominators
 - Writing equivalent rational expressions with polynomial denominators
 - Writing equivalent rational expressions involving opposite factors
 - Adding rational expressions with denominators ax and bx : Advanced
 - Adding rational expressions with denominators ax^n and bx^m
 - Adding rational expressions with multivariate monomial denominators: Basic
 - Adding rational expressions with multivariate monomial denominators: Advanced

- Adding rational expressions with linear denominators without common factors: Advanced
- Adding rational expressions with linear denominators with common factors: Advanced
- Adding rational expressions with denominators $ax-b$ and $b-ax$
- Adding 3 rational expressions with different quadratic denominators
- Complex fraction involving multivariate monomials
- Complex fraction: GCF factoring
- Complex fraction: Quadratic factoring
- Complex fraction made of sums involving rational expressions: Problem type 1
- Complex fraction made of sums involving rational expressions: Problem type 2
- Complex fraction made of sums involving rational expressions: Problem type 3
- Complex fraction made of sums involving rational expressions: Problem type 4
- Complex fraction made of sums involving rational expressions: Problem type 6
- Complex fraction made of sums involving rational expressions: Multivariate
- Solving a rational equation that simplifies to quadratic: Proportional form, basic
- Solving a rational equation that simplifies to quadratic: Proportional form, advanced
- Solving for a variable in terms of other variables in a rational equation: Problem type 3
- Identifying direct variation equations
- Identifying direct variation from ordered pairs and writing equations
- Writing a direct variation equation
- Word problem on direct variation
- Interpreting direct variation from a graph
- Writing an inverse variation equation
- Identifying direct and inverse variation equations
- Identifying direct and inverse variation from ordered pairs and writing equations
- Word problem on inverse variation
- Word problem on inverse variation involving the completion of a task
- Writing an equation that models variation
- Word problem on combined variation
- Finding the asymptotes of a rational function: Linear over linear
- Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- Finding the asymptotes of a rational function: Quadratic over linear
- Graphing a rational function: Quadratic over linear
- Graphing rational functions with holes
- Matching graphs with rational functions: Two vertical asymptotes
- Graphing a rational function with more than one vertical asymptote
- Solving a quadratic inequality written in factored form
- Solving a quadratic inequality
- Solving a rational inequality: Problem type 1
- Solving a rational inequality: Problem type 2
- Quadratic, Exponential, and Logarithmic Functions (76 topics)
 - Solving a quadratic equation using the square root property: Decimal answers, basic
 - Solving a quadratic equation using the square root property: Decimal answers, advanced
 - Solving a quadratic equation by completing the square: Decimal answers
 - Solving a quadratic equation by completing the square: Exact answers
 - Applying the quadratic formula: Decimal answers
 - [Deriving the quadratic formula](#) NEW
 - Discriminant of a quadratic equation
 - Discriminant of a quadratic equation with a parameter
 - Solving an equation that can be written in quadratic form: Problem type 1
 - Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients
 - [Finding the linear factors of a quadratic function given its zeros and describing the general relationship between linear factors and zeros](#)
 - [Finding the zeros of a quadratic function given its linear factors and describing the general relationship between linear factors and zeros](#)
 - Using a graphing calculator to find the zeros of a quadratic function
 - Using a graphing calculator to find the x-intercept(s) and vertex of a quadratic function
 - Writing the equation of a quadratic function given a real-world description
 - Rewriting a quadratic function in standard form
 - Word problem involving optimizing area by using a quadratic function
 - Range of a quadratic function
 - Solving a quadratic equation by graphing
 - Classifying the graph of a function
 - Determining whether a given situation is best modeled by a linear, exponential, or quadratic function
 - Choosing a quadratic model and using it to make a prediction
 - [Using technology to determine the better regression model for a given data set and using that model to make a prediction: Exponential and quadratic](#)
 - [Composition of a function with itself](#)
 - Expressing a function as a composition of two functions
 - Composition of two functions: Domain and range
 - Composition of two functions: Advanced

- Word problem involving composition of two functions
- Rewriting a multivariate function as a univariate function given a relationship between its variables
- Determining whether an equation defines a function: Basic
- Horizontal line test
- Determining whether two functions are inverses of each other
- Graphing the inverse of a function given its graph
- Even and odd functions: Problem type 2
- Graphing an exponential function: $f(x) = a(b)^x$
- Comparing linear, quadratic, and exponential functions given in different forms
- Transforming the graph of a natural exponential function and finding its domain and range
- Graphing an exponential function and its asymptote: $f(x) = a(e)^{x-b} + c$
- Evaluating an exponential function with base e that models a real-world situation
- Choosing an exponential model and using it to make a prediction
- [Using technology to determine the better regression model for a given data set and using that model to make a prediction: Linear and exponential](#)

NEW

- Finding the final amount in a word problem on compound interest
- Finding the future value and interest for an investment earning compound interest
- Finding the present value of an investment earning compound interest
- Comparing linear, polynomial, and exponential functions
- Matching graphs with polynomial functions
- Inferring properties of a polynomial function from its graph
- Remainder theorem: Advanced
- Finding all possible rational zeros using the rational zeros theorem: Problem type 1
- Finding all possible rational zeros using the rational zeros theorem: Problem type 2
- Descartes' Rule of Signs
- Using the rational zeros theorem to find all zeros of a polynomial: Rational zeros
- Using the rational zeros theorem to find all zeros of a polynomial: Irrational zeros
- Using a graphing calculator to find zeros of a polynomial function
- Using a graphing calculator to solve a word problem involving a polynomial of degree 3
- Using the rational zeros theorem to find all zeros of a polynomial: Complex zeros
- Solving an equation of the form $\log_b a = c$
- Graphing a logarithmic function and finding its domain and range
- Graphing a logarithmic function: Advanced
- Using properties of logarithms to evaluate expressions
- Expanding a logarithmic expression: Problem type 2
- Expanding a logarithmic expression: Problem type 3
- Writing an expression as a single logarithm
- Change of base for logarithms: Problem type 1
- Change of base for logarithms: Problem type 2
- Solving a multi-step equation involving a single logarithm: Problem type 1
- Solving a multi-step equation involving a single logarithm: Problem type 2
- Solving a multi-step equation involving natural logarithms
- Solving an equation involving logarithms on both sides: Problem type 1
- Solving an equation involving logarithms on both sides: Problem type 2
- Solving an exponential equation by finding common bases: Linear exponents
- Finding the time in a word problem on compound interest
- Finding the initial amount in a word problem on continuous compound interest
- Finding half-life or doubling time
- Writing and evaluating a function modeling continuous exponential growth or decay given doubling time or half-life
- Writing and evaluating a function modeling continuous exponential growth or decay given two outputs

■ Angles, Triangles, and Quadrilaterals (87 topics)

- Midpoint of a number line segment: Integers
- Segment addition and midpoints
- Distance between two points in the plane: Exact answers
- Distance between two points in the plane: Decimal answers
- [Deriving the distance formula using the Pythagorean Theorem](#) **NEW**
- Identifying congruent segments in the plane
- Midpoint of a line segment in the plane
- [Deriving the midpoint formula on the coordinate plane using previous knowledge about midpoint on a number line](#) **NEW**
- [Finding the weighted average of two points on a line segment in the plane](#) **NEW**
- Finding supplementary and complementary angles
- [Writing and solving an equation involving adjacent angles](#) **NEW**
- Finding the complement or supplement of an angle given a figure
- Solving an equation involving complementary or supplementary angles
- Writing and solving an equation involving complementary or supplementary angles
- Angle addition with relationships between angles
- Angle addition and angle bisectors
- Identifying linear pairs and vertical angles
- Finding angle measures given two intersecting lines
- Solving equations involving vertical angles and linear pairs
- Writing and solving an equation involving vertical angles
- Constructing congruent line segments

- Constructing an angle bisector
 - Constructing the perpendicular bisector of a line segment
 - Introduction to proofs: Justifying statements
 - Proofs involving segment congruence
 - Proofs involving angle congruence
 - Identifying corresponding and alternate angles
 - Finding angle measures given two parallel lines cut by a transversal
 - Solving equations involving angles and a pair of parallel lines
 - Solving equations involving angles and two pairs of parallel lines
 - Establishing facts about the angles created when parallel lines are cut by a transversal
 - Constructing a pair of perpendicular lines
 - Introduction to proofs involving parallel lines
 - Proofs involving parallel lines
 - Finding an angle measure for a triangle with an extended side
 - Finding an angle measure given extended triangles
 - Finding an angle measure given a triangle and parallel lines
 - Finding angle measures of a triangle given angles with variables
 - Writing an equation to find angle measures of a triangle given angles with variables
 - Establishing facts about the interior angles of a triangle
 - Establishing facts about the interior and exterior angles of a triangle
 - Identifying and naming congruent parts of congruent triangles
 - Identifying transformations
 - Determining if figures are related by rigid motions
 - Completing proofs involving congruent triangles using SSS or SAS
 - Introduction to proving triangles congruent using SSS or SAS
 - Identifying and naming congruent triangles
 - Completing proofs involving congruent triangles using ASA or AAS
 - Introduction to proving triangles congruent using ASA or AAS
 - Proofs involving congruent triangles and segment or angle bisectors
 - Separating overlapping triangles and identifying common features
 - Proofs involving congruent triangles that overlap: Basic
 - Proofs involving congruent triangles with parallel or perpendicular segments
 - Determining when to apply the HL congruence property
 - Introduction to proving triangles congruent using the HL property
 - Introduction to proofs involving congruent triangles and CPCTC
 - Proofs involving congruent triangles, parallel or perpendicular segments, and CPCTC
 - Proofs involving congruent triangles that overlap: Advanced
 - Finding side lengths and angle measures of isosceles and equilateral triangles
 - Finding an angle measure for a triangle sharing a side with another triangle
 - Finding angle measures of an isosceles triangle given angles with variables
 - Proofs of theorems involving isosceles triangles
 - Word problem involving the Pythagorean Theorem
 - Using the Pythagorean Theorem repeatedly
 - Using the Pythagorean Theorem to find distance on a grid
 - Using the Pythagorean Theorem to find the distance between two points in the plane in context
 - Identifying side lengths that give right triangles
 - Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
 - Classifying segments inside triangles
 - Using the circumcenter of a triangle to find segment lengths
 - Using the incenter of a triangle to find segment lengths and angle measures
 - Using the centroid of a triangle to find segment lengths
 - [Verifying the Centroid Theorem](#) NEW
 - Introduction to the triangle midsegment theorem
 - Proving the triangle midsegment theorem in the coordinate plane
 - Proof involving points on the perpendicular bisector of a line segment
 - Identifying parallelograms, rectangles, and squares
 - Properties of quadrilaterals
 - Classifying parallelograms
 - Finding measures involving diagonals of parallelograms
 - [Investigating properties of diagonals of parallelograms](#) NEW
 - Conditions for parallelograms
 - Finding measures involving diagonals of rectangles
 - Finding angle measures involving diagonals of a rhombus
 - Conditions for quadrilaterals
 - Completing proofs of theorems involving sides of a parallelogram
 - Completing proofs of theorems involving angles of a parallelogram
- Similarity and Transformations (63 topics)
 - Identifying similar or congruent shapes on a grid
 - Finding a missing side length given two similar triangles
 - Finding angle measures of a triangle given two angles of a similar triangle
 - Finding angle measures and side ratios to determine if two triangles are similar
 - Similar polygons
 - Similar right triangles

- Indirect measurement
 - Triangles and parallel lines
 - Identifying and naming similar triangles
 - Proofs involving similar triangles
 - Completing proofs involving the triangle proportionality theorem
 - Finding lengths using scale models
 - Finding a scale factor: Same units
 - Using a scale drawing to find actual area
 - Reproducing a scale drawing at a different scale
 - Identifying similar right triangles that overlap
 - Right triangles and geometric mean
 - Proving the Pythagorean Theorem using similar triangles
 - Special right triangles: Decimal answers
 - Special right triangles: Exact answers
 - Translating a point and giving its coordinates: One step
 - Translating a point and giving its coordinates: Two steps
 - Properties of translated figures
 - Determining if figures are related by a translation
 - Translating a polygon
 - Using a translated point to find coordinates of other translated points
 - Reflecting a point across an axis
 - Reflecting a point across both coordinate axes
 - Reflecting a point across an axis and giving its coordinates
 - Finding the coordinates of a point reflected across an axis
 - Finding the coordinates of a point reflected across both axes
 - Reflecting a polygon across the x-axis or y-axis
 - Properties of reflected figures
 - Determining if figures are related by a reflection
 - Reflecting a polygon over a vertical or horizontal line
 - Finding the coordinates of three points reflected over an axis
 - Finding the coordinates of a point reflected across an axis and translated
 - Rotating a point and giving its coordinates
 - Properties of rotated figures
 - Determining if figures are related by a rotation
 - Rotating a figure about the origin
 - Drawing lines of symmetry
 - Finding an angle of rotation
 - Identifying rotational symmetry and angles of rotation
 - Identifying figures that have rotational symmetry or reflectional symmetry NEW
 - Rotational and point symmetries
 - Writing a rule to describe a translation
 - Writing a rule to describe a reflection
 - Writing a rule to describe a rotation
 - Determining if figures are congruent and related by a transformation
 - Determining if figures are congruent and related by a sequence of transformations
 - Dilating a segment and giving the coordinates of its endpoints
 - The effect of dilation on side length
 - Determining if figures are related by a dilation
 - Finding a scale factor given a dilation in the coordinate plane
 - The effect of dilation on area
 - Dilating a figure
 - Performing a composition of dilations NEW
 - Performing a composition consisting of a rigid transformation and a dilation NEW
 - Writing a rule to describe a dilation
 - Exploring similarity of circles
 - Exploring the effect of dilation on lines
 - Identifying transformations and determining if they preserve congruent figures
- Area, Volume, and Circles (114 topics)
 - Area of a parallelogram
 - Finding the perimeter or area of a rectangle in the coordinate plane
 - Finding the perimeter of a triangle, trapezoid, or parallelogram in the coordinate plane
 - Finding the area of a triangle or parallelogram in the coordinate plane
 - Finding the area of a right triangle using the Pythagorean Theorem
 - Computing an area using the Pythagorean Theorem
 - Informal proof of the Pythagorean Theorem
 - Area involving rectangles and triangles
 - Area of a trapezoid
 - Area of a rhombus
 - Finding the area of a rhombus using the Pythagorean Theorem
 - Finding the area of a trapezoid, rhombus, or kite in the coordinate plane
 - Area of a regular polygon
 - Finding the area of a regular polygon using special right triangles
 - Side lengths, perimeters, and areas of similar polygons

- Investigating the effects on the area for non-proportional and proportional figures
- Introduction to a circle: Diameter, radius, and chord
- Finding the radius or the diameter of a circle given its circumference
- Informal argument for the formula of the circumference of a circle
- Circumference ratios
- Perimeter involving rectangles and circles
- Area of a circle
- Circumference and area of a circle
- Circumference and area of a circle: Exact answers in terms of π
- Distinguishing between the area and circumference of a circle
- Informal argument for the formula of the area of a circle
- Area involving rectangles and circles
- Area between two concentric circles
- Word problem involving the area between two concentric circles
- Area involving inscribed figures
- Area involving multiple inscribed figures
- Circles inscribed in and circumscribed about regular polygons
- Area of a sector of a circle: Exact answer in terms of π
- Informal argument for the formula of the area of a sector
- Classifying solids
- Vertices, edges, and faces of a solid
- Nets of solids
- Counting the cubes in a solid made of cubes
- Side views of a solid made of cubes
- Surface area of a cube or a rectangular prism
- Using a net to find the surface area of a rectangular prism
- Using a net to find the lateral surface area and total surface area of a rectangular prism
- [Deriving the formula for the surface area of a rectangular prism](#) NEW
- Word problem involving the surface area of a rectangular prism
- Word problem involving U.S. Customary conversions, surface area, and cost
- Surface area of a triangular prism
- Using a net to find the surface area of a triangular prism
- Using a net to find the lateral surface area and total surface area of a triangular prism
- [Deriving the formula for the surface area of a right triangular prism](#) NEW
- Surface area of a cylinder
- Surface area of a cylinder: Exact answers in terms of π
- [Deriving the formula for the surface area of a cylinder](#) NEW
- Word problem involving the surface area of a cylinder
- Word problem involving the surface area of rectangular prisms and cylinders
- Using a net to find the lateral surface area and total surface area of a pyramid
- Word problem involving the surface area of rectangular prisms and pyramids
- Lateral surface area and surface area of a cone
- Lateral surface area and surface area of a cone: Exact answers in terms of π
- Volume of a rectangular prism made of unit cubes
- Volume of a rectangular prism with fractional edge lengths
- Writing equivalent expressions for the volume of a rectangular prism
- Volume of an oblique rectangular prism
- Distinguishing between surface area and volume
- Solving problems involving the volume of a rectangular prism in context
- Word problem involving the rate of filling or emptying a rectangular prism
- Word problem on volume involving conversions of U.S. Customary units
- Volume of a piecewise rectangular prism
- Word problem involving the volume of a piecewise rectangular prism
- Volume of a triangular prism
- Word problem involving the volume of a triangular prism
- Volume of a cylinder
- Informal argument for the formula of the volume of a cylinder
- Volume of an oblique cylinder
- Describing the formula for the volume of a cylinder
- Word problem involving the volume of a cylinder
- Word problem involving the rate of filling or emptying a cylinder
- Word problem on density involving the volume of a cylindrical solid
- Using cross sections to identify solids with the same volume
- Volume of a pyramid
- Relating the volumes of a rectangular prism and a rectangular pyramid
- Relating the volumes of a triangular prism and a triangular pyramid
- Volume of a cone
- Volume of a cone: Exact answers in terms of π
- Informal argument for the formula of the volume of a cone
- Relating the volumes of a cylinder and a cone
- Word problem involving the volume of a cone
- Surface area of a sphere
- Volume of a sphere
- Word problem involving the volume of a sphere

- Identifying similar solids
- Computing ratios of side lengths, surface areas, and volumes for similar solids
- Computing side length, surface area, and volume for similar solids
- Word problem involving volumes of similar solids
- Identifying chords, secants, and tangents of a circle
- Tangents of a circle: Problem type 1
- Tangents of a circle: Problem type 2
- Drawing a circle with a given radius or diameter
- Constructing a tangent of a circle
- Naming and finding measures of central angles, inscribed angles, and arcs of a circle
- Applying properties of radii, diameters, and chords
- Arc length
- Arc length and area of a sector of a circle
- Computing ratios of arc lengths to radii and describing the result
- Central angles and inscribed angles of a circle
- Central angles and angles involving chords and tangents of a circle
- Inscribed angles in relation to a diameter or a polygon inscribed in a circle
- Inscribed angles and angles involving chords and tangents of a circle
- Establishing facts about a quadrilateral inscribed in a circle
- Inscribing an equilateral triangle or a regular hexagon in a circle
- Inscribing a square in a circle
- Inscribing a circle in a triangle
- Circumscribing a circle about a triangle
- Angles of intersecting secants and tangents
- Lengths of chords, secants, and tangents
- Sequences, Probability, and Conic Sections (137 topics)
 - Finding the first terms of a sequence using an explicit rule with multiple occurrences of n
 - Finding the next terms of an arithmetic sequence with whole numbers
 - Finding the first terms of a sequence using a recursive rule
 - Identifying arithmetic sequences and finding the common difference
 - Finding a specified term of an arithmetic sequence given two terms of the sequence
 - Writing an explicit rule for an arithmetic sequence
 - Writing a recursive rule for an arithmetic sequence
 - Finding patterns in shapes
 - Sum of the first n terms of an arithmetic sequence
 - Finding the next terms of a geometric sequence with whole numbers
 - Identifying arithmetic and geometric sequences
 - Finding a specified term of a geometric sequence given two terms of the sequence
 - Arithmetic and geometric sequences: Identifying and writing an explicit rule
 - Writing recursive rules for arithmetic and geometric sequences
 - Sum of an infinite geometric series
 - Identifying linear, quadratic, and exponential functions given ordered pairs
 - Identifying statistical questions
 - Classification of variables
 - Classifying samples
 - Identifying and reducing statistical bias
 - Making predictions using experimental data for compound events
 - Constructing a two-way frequency table: Advanced
 - Computing a percentage from a table of values
 - Making an inference using a two-way frequency table
 - Calculating relative frequencies in a contingency table
 - Calculating relative frequencies in a contingency table: Advanced
 - Making a reasonable inference based on proportion statistics
 - Constructing a line plot
 - Understanding how adjusting the vertical scale can make a graph misleading
 - Understanding how two dimensional graphs can be misleading
 - Interpreting a histogram
 - Shapes of discrete distributions NEW
 - Interpreting a stem-and-leaf plot
 - Constructing a stem-and-leaf plot NEW
 - Finding a percentage of a total amount in a circle graph
 - Angle measure in a circle graph
 - Interpreting a percent bar graph to summarize categorical data using the mode NEW
 - How changing a value affects the range and IQR
 - Mean of a data set
 - Computations involving the mean, sample size, and sum of a data set
 - Weighted mean
 - Finding outliers in a data set
 - Choosing the best measure to describe data
 - Identifying the center, spread, and shape of a data set
 - Interpreting percentile ranks
 - Percentiles
 - Using back-to-back stem-and-leaf plots to compare data sets

- Five-number summary and interquartile range
- Interpreting a box-and-whisker plot
- Interpreting a box-and-whisker plot: Problem type 2
- Constructing a box-and-whisker plot
- Using box-and-whisker plots to compare data sets
- Interpreting a tree diagram
- Introduction to the counting principle
- Counting principle
- Counting principle with repetition allowed
- Counting arrangements of objects that are not all distinct
- Introduction to permutations and combinations
- Permutations and combinations: Problem type 1
- Permutations and combinations: Problem type 2
- Permutations and combinations: Problem type 3
- Probabilities of an event and its complement
- Finding the odds in favor and against
- Area as probability
- Experimental and theoretical probability for compound events
- Probabilities involving two rolls of a die
- Probabilities of a permutation and a combination
- Identifying independent events given descriptions of experiments
- Probability of independent events
- Probability of dependent events
- Probability of independent events: Decimal answers
- Probability of dependent events: Decimal answers
- Probabilities of draws with replacement
- Probabilities of draws without replacement
- Using a Venn diagram to understand the addition rule for probability
- Outcomes and event probability: Addition rule
- Probability of the union of two events
- Word problem involving the probability of a union
- Computing probability involving the addition rule using a two-way frequency table
- Probability of intersection or union: Word problems
- Using a Venn diagram to understand the multiplication rule for probability
- Outcomes and event probability: Conditional probability
- Identifying independent events given values of probabilities
- Computing conditional probability using a two-way frequency table
- Conditional probability: Basic
- Using the binomial formula to solve a word problem: Problem type 1
- Using the binomial formula to solve a word problem: Problem type 2
- Identifying outcomes in a random number table used to simulate a compound event
- Using a random number table to simulate a compound event
- Finding a probability given a normal distribution: Advanced
- Finding a z-score and interpreting it in terms of the population mean and standard deviation
- Comparing the relative sizes of data values based on their z-scores
- Graphing a parabola of the form $y^2 = ax$ or $x^2 = ay$
- Graphing a parabola of the form $x = a(y-k)^2 + h$ or $y = a(x-h)^2 + k$
- Graphing a parabola of the form $ay^2 + by + cx + d = 0$ or $ax^2 + bx + cy + d = 0$
- Deriving the equation of a parabola given its focus and directrix
- Writing an equation of a parabola given the vertex and the focus
- Writing an equation of a parabola given the focus and the directrix
- Finding the vertex, focus, directrix, and axis of symmetry of a parabola
- Finding the focus of a parabola of the form $ay^2 + by + cx + d = 0$ or $ax^2 + bx + cy + d = 0$
- Writing an equation of a parabola given its graph
- Word problem involving a parabola
- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic
- Identifying the center and radius to graph a circle given its equation in general form: Advanced
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle and identifying points that lie on the circle
- Writing an equation of a circle given its center and radius or diameter
- Deriving the equation of a circle using the Pythagorean Theorem
- Writing an equation of a circle given its center and a point on the circle
- Writing an equation of a circle given the endpoints of a diameter
- Graphing an ellipse given its equation in standard form
- Graphing an ellipse centered at the origin: $Ax^2 + By^2 = C$
- Graphing an ellipse given its equation in general form
- Finding the center, vertices, and foci of an ellipse
- Finding the foci of an ellipse given its equation in general form
- Writing an equation of an ellipse given the center, an endpoint of an axis, and the length of the other axis
- Writing an equation of an ellipse given the foci and the major axis length
- Word problem involving an ellipse
- Graphing a hyperbola given its equation in standard form

- Graphing a hyperbola centered at the origin: $Ax^2 + By^2 = C$
 - Graphing a hyperbola given its equation in general form
 - Finding the center, vertices, foci, and asymptotes of a hyperbola
 - Finding the foci of a hyperbola given its equation in general form
 - Writing an equation of a hyperbola given the foci and the vertices
 - Writing an equation of a hyperbola given the foci and the asymptotes: Basic
 - Writing an equation of a hyperbola given the foci and the asymptotes: Advanced
 - Classifying conics given their equations
 - Graphing a quadratic inequality: Problem type 1
 - Graphing a quadratic inequality: Problem type 2
 - Graphically solving a system of linear and quadratic equations
 - Solving a system of linear and quadratic equations
 - Using a graphing calculator to solve a nonlinear system of equations: Advanced
 - Solving a system of nonlinear equations: Problem type 1
 - Solving a word problem involving geometry using a system of nonlinear equations
 - Graphing a system of nonlinear inequalities: Problem type 1
 - Graphing a system of nonlinear inequalities: Problem type 2
- Trigonometry (106 topics)
- Sine, cosine, and tangent ratios: Variables for side lengths
 - Using the Pythagorean Theorem to find several trigonometric ratios in a right triangle
 - Using the Pythagorean Theorem to find a sine, cosine, or tangent ratio in a right triangle
 - Understanding trigonometric ratios through similar right triangles
 - Relationship between the sines and cosines of complementary angles
 - Using similar right triangles to find trigonometric ratios
 - Using trigonometry to find a length in a word problem with two right triangles
 - Converting degrees-minutes-seconds to decimal degrees
 - Converting decimal degrees to degrees-minutes-seconds
 - Converting between degree and radian measure: Problem type 2
 - Coterminal angles
 - Arc length and central angle measure
 - Area of a sector of a circle
 - Finding values of trigonometric functions from a point on the unit circle
 - Trigonometric functions and special angles: Problem type 3
 - Evaluating a sinusoidal function that models a real-world situation
 - Reference angles: Problem type 1
 - Reference angles: Problem type 2
 - Determining the location of a terminal point given the signs of trigonometric values
 - Finding values of trigonometric functions given information about an angle: Problem type 1
 - Finding values of trigonometric functions given information about an angle: Problem type 2
 - Finding values of trigonometric functions given information about an angle: Problem type 3
 - Values of inverse trigonometric functions
 - Using trigonometry to find the area of a triangle
 - Sketching the graph of $y = a \sin(bx+c)$ or $y = a \cos(bx+c)$
 - Sketching the graph of $y = a \sin(bx) + d$ or $y = a \cos(bx) + d$
 - Amplitude, period, and phase shift of a sine or cosine function
 - Writing the equation of a sine or cosine function given its graph: Problem type 1
 - Writing the equation of a sine or cosine function given its graph: Problem type 2
 - Word problem involving a sine or cosine function: Problem type 2
 - Matching graphs and equations for secant, cosecant, tangent, and cotangent functions
 - Sketching the graph of a secant or cosecant function: Problem type 2
 - Sketching the graph of a tangent or cotangent function: Problem type 2
 - Simplifying trigonometric expressions
 - Using cofunction identities
 - Verifying a trigonometric identity
 - Proving trigonometric identities: Problem type 1
 - Proving trigonometric identities: Problem type 2
 - Proving trigonometric identities: Problem type 3
 - Proving trigonometric identities using odd and even identities
 - Sum and difference identities: Problem type 1
 - Sum and difference identities: Problem type 2
 - Sum and difference identities: Problem type 3
 - Proving trigonometric identities using sum and difference identities: Problem type 1
 - Proving trigonometric identities using sum and difference properties: Problem type 2
 - Double-angle identities: Problem type 1
 - Double-angle identities: Problem type 2
 - Half-angle identities: Problem type 1
 - Half-angle identities: Problem type 2
 - Proving trigonometric identities using double-angle properties
 - Finding solutions in an interval for a basic trigonometric equation involving sine or cosine
 - Finding solutions in an interval for a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
 - Using a calculator to approximate inverse trigonometric values
 - Finding solutions in an interval for a basic trigonometric equation using a calculator
 - Solving a basic trigonometric equation involving sine or cosine

- Solving a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
- Finding solutions in an interval for a trigonometric equation in factored form
- Finding solutions in an interval for a trigonometric equation involving a squared function: Problem type 1
- Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 2
- Finding solutions in an interval for a trigonometric equation using Pythagorean identities: Problem type 1
- Finding solutions in an interval for a trigonometric equation involving sine and/or cosine using double-angle identities
- Solving a trigonometric equation modeling a real-world situation
- Using a graphing calculator to solve a trigonometric equation
- Solving a trigonometric equation involving a squared function: Problem type 1
- Solving a trigonometric equation involving a squared function: Problem type 2
- Solving a trigonometric equation involving more than one function
- Solving a trigonometric equation involving an angle multiplied by a constant
- Finding solutions in an interval for a trigonometric equation involving sine and cosine using sum and difference identities
- Solving a trigonometric equation using sum and difference identities
- Solving a trigonometric equation using double-angle identities
- Writing a vector in component form given its initial and terminal points
- Magnitude of a vector given in component form
- Vector addition and scalar multiplication: Component form
- Linear combination of vectors: Component form
- Multiplication of a vector by a scalar: Geometric approach
- Vector addition: Geometric approach
- Vector subtraction: Geometric approach
- Finding the magnitude and direction of a vector given its graph
- Finding the components of a vector given its graph
- Finding magnitudes of forces related to a sum of three vectors
- Finding magnitudes of forces related to an object suspended by cables
- Dot product of vectors given in component form
- Finding the angle between two vectors given in component form
- Using the dot product to find perpendicular vectors
- Plotting points in polar coordinates
- Multiple representations of polar coordinates
- Converting rectangular coordinates to polar coordinates: Special angles
- Converting rectangular coordinates to polar coordinates: Decimal answers
- Converting polar coordinates to rectangular coordinates
- Plotting complex numbers
- Writing a complex number in standard form given its trigonometric form
- Writing a complex number in trigonometric form: Special angles
- Writing a complex number in trigonometric form: Decimal answers
- Multiplying and dividing complex numbers in trigonometric form
- De Moivre's Theorem: Answers in trigonometric form
- De Moivre's Theorem: Answers in standard form
- Finding the n th roots of a number: Problem type 1
- Finding the n th roots of a number: Problem type 2
- Completing a table and choosing a graph given a pair of parametric equations
- Writing the equation of a line and sketching its graph given its parametric equations
- Writing the equation of a parabola and sketching its graph given its parametric equations
- Writing the equation of a circle or ellipse and sketching its graph given its parametric equations
- Graphing a pair of parametric equations with a restricted domain: Line or parabola
- Graphing a pair of parametric equations with a restricted domain: Circle
- Graphing a pair of parametric equations with a restricted domain: Ellipse
- Completing pairs of parametric equations

***Other Topics Available** By default, these topics are NOT included in the course, but can be added using the content editor in the Teacher Module.