

## Integrated Mathematics II

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

Curriculum (550 topics + 889 additional topics)

- Real Numbers (63 topics)
  - Factors, Multiples, and Equivalent Fractions (3 topics)
    - Greatest common factor of 2 numbers
    - Simplifying a fraction
    - Division involving zero
  - Arithmetic with Fractions and Decimals (9 topics)
    - Addition or subtraction of fractions with different denominators
    - Fraction multiplication
    - Fraction division
    - Complex fraction without variables: Problem type 1
    - Decimal subtraction: Basic
    - Multiplication of a decimal by a power of ten
    - Multiplying a decimal by a whole number
    - Division of a decimal by a power of ten
    - Division of a decimal by a whole number
  - Ordering, the Number Line, and Absolute Value (7 topics)
    - Rounding decimals
    - Plotting integers on a number line
    - Using a common denominator to order fractions
    - Ordering integers
    - Square root of a perfect square
    - Using a calculator to approximate a square root
    - Absolute value of a number
  - Operations with Signed Numbers (12 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
    - Addition and subtraction with 3 integers
    - Operations with absolute value: Problem type 1
    - 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 multiplication: Basic
  - Exponents and Order of Operations (7 topics)
    - Introduction to exponents
    - Order of operations with whole numbers
    - Order of operations with whole numbers and exponents: Basic
    - Exponents and fractions
    - Exponents and integers: Problem type 1
    - Exponents and signed fractions
    - Order of operations with integers
  - Evaluating Expressions (5 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 a linear expression: Integer multiplication with addition or subtraction
    - Evaluating a quadratic expression: Integers
  - Properties of Real Numbers (7 topics)
    - Combining like terms: Whole number coefficients
    - Combining like terms: Integer coefficients
    - Multiplying a constant and a linear monomial
    - Distributive property: Whole number coefficients
    - Distributive property: Integer coefficients

- Using distribution and combining like terms to simplify: Univariate
- Combining like terms in a quadratic expression
- Introduction to Perimeter, Area, and Volume (7 topics)
  - Perimeter of a square or a rectangle
  - Writing algebraic expressions for the perimeter of a figure
  - Area of a square or a rectangle
  - Writing algebraic expressions for the area of a figure
  - Solving a two-step word problem involving the area of a rectangle
  - Volume of a rectangular prism
  - Word problem involving the volume of a rectangular prism
- Ratios and Percents (6 topics)
  - Writing ratios for real-world situations
  - Simplifying a ratio of whole numbers: Problem type 1
  - Finding missing values in a table expressing a constant rate
  - Solving a word problem on proportions using a unit rate
  - Converting between percentages and decimals
  - Finding a percentage of a whole number
- Linear Equations and Inequalities (64 topics)
  - One-Step Linear Equations (10 topics)
    - Identifying solutions to a one-step linear equation: Problem type 1
    - Identifying solutions to a one-step linear equation: Problem type 2
    - Additive property of equality with whole numbers
    - Additive property of equality with decimals
    - Additive property of equality with integers
    - Multiplicative property of equality with whole numbers
    - Multiplicative property of equality with fractions
    - Multiplicative property of equality with decimals
    - Multiplicative property of equality with integers
    - Multiplicative property of equality with signed fractions
  - Multi-Step Linear Equations (12 topics)
    - Identifying solutions to a linear equation in one variable: Two-step equations
    - Using two steps to solve an equation with whole numbers
    - 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
    - Introduction to solving an equation with variables on the same side
    - Solving a linear equation with several occurrences of the variable: Variables on the same side
    - Introduction to solving a linear equation with a variable on each 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
  - Writing Expressions and Equations (5 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
  - Applications Involving Linear Equations (7 topics)
    - Writing and solving a one-step equation with decimals that models a real-world situation
    - 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
    - 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
    - Finding a side length given the perimeter and side lengths with variables
  - Solving for a Variable and Dimensional Analysis (3 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
  - Proportions and Applications Involving Percents (10 topics)
    - Solving a proportion of the form  $x/a=b/c$ : Basic
    - Solving a proportion of the form  $x/a = b/c$
    - 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
- Writing and Graphing Inequalities (4 topics)
  - Translating a sentence by using an inequality symbol
  - Introduction to identifying solutions to an inequality
  - Writing an inequality for a real-world situation
  - Graphing a linear inequality on the number line
- One-Step Linear Inequalities (5 topics)
  - Identifying solutions to a one-step linear inequality
  - 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
- Multi-Step Linear Inequalities (4 topics)
  - 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
- Sets (2 topics)
  - Interpreting a Venn diagram of 2 sets
  - Interpreting a Venn diagram of 3 sets
- Compound Inequalities (2 topics)
  - Translating a sentence into a compound inequality
  - Graphing a compound inequality on the number line
- The Coordinate Plane and Equations of Lines (48 topics)
  - Ordered Pairs (7 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 the graph
    - Finding distances between points that share a common coordinate given their coordinates
  - Tables and Graphs of Lines (12 topics)
    - Table for a linear equation
    - Writing a function rule given a table of ordered pairs: One-step rules
    - Identifying solutions to a linear equation in two variables
    - 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
    - Interpreting a line graph
  - 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 (10 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
    - Writing the equation of a line through two given points
    - Comparing linear functions to the parent function  $y = x$
    - Identifying parallel and perpendicular lines
    - Identifying parallel and perpendicular lines from coordinates
  - Applications Involving Linear Equations with Two Variables (8 topics)

- Finding outputs of a one-step function that models a real-world situation: Two variable equation
  - Finding outputs of a two-step function with decimals that models a real-world situation: Two variable equation
  - 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
  - Comparing properties of linear functions given in different forms
  - Interpreting the parameters of a linear function that models a real-world situation
- Scatter Plots and Lines of Best Fit (1 topics)
    - Sketching the line of best fit
  - Direct and Inverse Variation (8 topics)
    - Identifying direct variation equations
    - Identifying direct variation from ordered pairs and writing equations
    - Writing a direct variation equation
    - Word problem on direct variation
    - 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
  - Functions and Systems (38 topics)
    - Introduction to Functions (6 topics)
      - Domain and range from ordered pairs
      - Table for a linear function
      - Evaluating functions: Linear and quadratic or cubic
      - 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 (18 topics)
      - Finding an output 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
      - Finding where a function is increasing, decreasing, or constant given the graph
      - 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 absolute value equation of the form  $y = A|x|$
      - Graphing an absolute value equation in the plane: Basic
      - Graphing a parabola of the form  $y = ax^2$
      - Graphing a parabola of the form  $y = (x-h)^2 + k$
      - 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 (8 topics)
      - Translating the graph of a parabola: One step
      - Translating the graph of a parabola: Two steps
      - 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  $y=x^2$
      - 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
    - Systems of Linear Equations (6 topics)
      - Identifying the solution of systems of linear equations from graphs
      - Graphically solving a system of linear equations both of the form  $y=mx+b$
      - Graphically solving a system of linear equations
      - 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
  - Exponents and Polynomials (38 topics)
    - Product, Power, and Quotient Rules (6 topics)
      - Introduction to the product rule of exponents
      - Product rule with positive exponents: Univariate

- Introduction to the power of a power rule of exponents
- Introduction to the power of a product rule of exponents
- Introduction to the quotient rule of exponents
- Simplifying a ratio of univariate monomials
- Negative Exponents (7 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
  - Introduction to the product rule with negative exponents
  - Quotient rule with negative exponents: Problem type 1
  - Power of a power rule with negative exponents
- Polynomial Addition, Subtraction, and Multiplication (6 topics)
  - Simplifying a sum or difference of two univariate polynomials
  - Multiplying a univariate polynomial by a monomial with a positive coefficient
  - Multiplying binomials with leading coefficients of 1
  - Multiplying binomials with leading coefficients greater than 1
  - Multiplying conjugate binomials: Univariate
  - Squaring a binomial: Univariate
- 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 Quadratic Trinomials (4 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 Special Products (2 topics)
  - Factoring a perfect square trinomial with leading coefficient 1
  - Factoring a difference of squares in one variable: Basic
- Polynomial Division (1 topics)
  - Closure properties of integers and polynomials
- Solving Quadratic Equations by Factoring (7 topics)
  - Solving an equation written in factored form
  - Finding the roots of a quadratic equation of the form  $ax^2 + bx = 0$
  - 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
  - Solving a word problem using a quadratic equation with rational roots
  - Writing and solving a quadratic equation for a real-world problem involving area or volume
- Quadratic Inequalities (2 topics)
  - Solving a quadratic inequality written in factored form
  - Solving a quadratic inequality
- Radicals (28 topics)
  - Roots of Perfect Powers (5 topics)
    - Square root of a rational perfect square
    - Square roots of perfect squares with signs
    - Introduction to simplifying a radical expression with an even exponent
    - Square root of a perfect square monomial
    - Cube root of an integer
  - Rational Exponents (7 topics)
    - 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: Non-unit fraction exponent with a whole number base
    - Rational exponents: Product rule
    - Rational exponents: Quotient rule
    - Rational exponents: Power of a power rule
  - Simplifying Expressions (5 topics)
    - Simplifying the square root of a whole number less than 100
    - 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
- Addition and Subtraction (1 topics)
  - Introduction to square root addition or subtraction
- Multiplication (4 topics)
  - Introduction to square root multiplication
  - Square root multiplication: Basic
  - Square root multiplication: Advanced
  - Classifying sums and products as rational or irrational
- Division and Rationalization (2 topics)
  - Simplifying a quotient of square roots
  - Rationalizing a denominator: Quotient involving square roots
- Complex Numbers (4 topics)
  - Using  $i$  to rewrite square roots of negative numbers
  - Simplifying a product and quotient involving square roots of negative numbers
  - Adding or subtracting complex numbers
  - Multiplying complex numbers
- Quadratic and Exponential Functions (42 topics)
  - Quadratic Equations (10 topics)
    - Solving an equation of the form  $x^2 = a$  using the square root property
    - Solving a quadratic equation using the square root property: Decimal answers, basic
    - Solving a quadratic equation using the square root property: Decimal answers, advanced
    - Completing the square
    - Solving a quadratic equation by completing the square: Decimal answers
    - Applying the quadratic formula: Exact answers
    - Applying the quadratic formula: Decimal answers
    - Solving a quadratic equation with complex roots
    - Discriminant of a quadratic equation
    - Solving a word problem using a quadratic equation with irrational roots
  - Quadratic Functions (22 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
    - Finding the zeros of a quadratic function given its equation
    - Writing a quadratic function given its zeros
    - Finding the x-intercept(s) and the vertex of a parabola
    - Using a graphing calculator to find the x-intercept(s) and vertex of a quadratic function
    - Rewriting a quadratic function in standard form
    - 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
    - Finding the domain and range from the graph of a parabola
    - 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
    - Classifying the graph of a 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
  - Function Operations (1 topics)
    - Sum, difference, and product of two functions
  - Graphing Exponential Functions (2 topics)
    - Table for an exponential function
    - Graphing an exponential function:  $f(x) = b^x$
  - Applications of Exponential Functions (7 topics)
    - Using a calculator to evaluate exponential expressions
    - Evaluating an exponential function that models a real-world situation
    - 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
  - Comparing linear, polynomial, and exponential functions
- Segments, Lines and Angles (36 topics)
  - Points, Lines, and Planes (2 topics)
    - Naming segments, rays, and lines
    - Identifying congruent shapes on a grid
  - Distances and Midpoints on a Number Line (5 topics)
    - Introduction to segment addition
    - Finding a point on a number line given the length of a segment and another point
    - Midpoint of a number line segment: Integers
    - Segment addition and midpoints
    - Finding a point that partitions a number line segment in a given ratio
  - Distances and Midpoints in the Coordinate Plane (4 topics)
    - Distance between two points in the plane: Exact answers
    - Identifying congruent segments in the plane
    - Midpoint of a line segment in the plane
    - Finding a point that partitions a segment in the plane in a given ratio
  - Angles (11 topics)
    - Measuring an angle with the protractor
    - Drawing an angle with the protractor
    - Acute, obtuse, and right angles
    - Naming angles, sides of angles, and vertices
    - Finding supplementary and complementary angles
    - Introduction to angle addition
    - Finding the complement or supplement of an angle given a figure
    - Angle addition with relationships between angles
    - Identifying linear pairs and vertical angles
    - Finding angle measures given two intersecting lines
    - Solving equations involving vertical angles and linear pairs
  - Segment and Angle Constructions (3 topics)
    - Constructing congruent line segments
    - Constructing an angle bisector
    - Constructing the perpendicular bisector of a line segment
  - Proofs Involving Segments and Angles (3 topics)
    - Introduction to proofs: Justifying statements
    - Proofs involving segment congruence
    - Proofs involving angle congruence
  - Parallel Lines and Transversals (8 topics)
    - 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
- Triangles and Other Polygons (50 topics)
  - Classifying Triangles (1 topics)
    - Acute, obtuse, and right triangles
  - Angles of Triangles (5 topics)
    - Finding an angle measure of a triangle given two angles
    - 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
    - Establishing facts about the interior angles of a triangle
  - Congruent Triangles (4 topics)
    - Identifying and naming congruent parts of congruent triangles
    - Identifying transformations
    - Determining if figures are related by rigid motions
    - Examining triangle congruence in terms of rigid motion
  - Proving Triangle Congruence (13 topics)
    - 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
- Isosceles and Equilateral Triangles (2 topics)
  - Finding side lengths and angle measures of isosceles and equilateral triangles
  - Proofs of theorems involving isosceles triangles
- The Pythagorean Theorem (4 topics)
  - Introduction to the Pythagorean Theorem
  - Pythagorean Theorem
  - Word problem involving the Pythagorean Theorem
  - Word problem involving the Pythagorean Theorem in three dimensions
- Segments within Triangles (3 topics)
  - 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
- Triangle Constructions and Triangle Inequalities (6 topics)
  - Creating triangles from given side lengths: Problem type 1
  - Using triangle inequality to determine if side lengths form a triangle
  - Using triangle inequality to determine possible lengths of a third side
  - Drawing a circle with a given radius or diameter
  - Relationship between angle measures and side lengths in a triangle
  - Relationship between angle measures and side lengths in two triangles
- Angles of Polygons (2 topics)
  - Naming polygons
  - Sum of the angle measures of a quadrilateral
- Quadrilaterals (10 topics)
  - Identifying parallelograms, rectangles, and squares
  - Properties of quadrilaterals
  - Classifying parallelograms
  - Finding measures involving diagonals of parallelograms
  - Finding measures involving diagonals of rectangles
  - Finding angle measures involving diagonals of a rhombus
  - Completing proofs of theorems involving sides of a parallelogram
  - Completing proofs of theorems involving angles of a parallelogram
  - Proving that a quadrilateral with given vertices is a parallelogram
  - Classifying parallelograms in the coordinate plane
- Similarity and Transformations (31 topics)
  - Similar Figures (8 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
  - Proofs Involving Triangle Similarity (5 topics)
    - Determining if figures are related by similarity transformations
    - Examining triangle similarity in terms of similarity transformations
    - Identifying and naming similar triangles
    - Proofs involving similar triangles
    - Completing proofs involving the triangle proportionality theorem
  - Scale Factors and Scale Drawings (3 topics)
    - Finding lengths using scale models
    - Finding a scale factor: Same units
    - Using a scale drawing to find actual area

- Similar Right Triangles and Special Right Triangles (4 topics)
  - Identifying similar right triangles that overlap
  - Right triangles and geometric mean
  - Proving the Pythagorean Theorem using similar triangles
  - Special right triangles: Exact answers
- Translations (3 topics)
  - Translating a point and giving its coordinates: One step
  - Translating a point and giving its coordinates: Two steps
  - Determining if figures are related by a translation
- Dilations (8 topics)
  - 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
  - Dilating a figure
  - Performing a composition of dilations
  - Performing a composition consisting of a rigid transformation and a dilation
  - Exploring similarity of circles
  - Exploring the effect of dilation on lines
- Area, Volume, and Circles (49 topics)
  - Areas of Parallelograms and Triangles (2 topics)
    - Area of a parallelogram
    - Area of a triangle
  - Areas of Trapezoids, Rhombi, and Kites (1 topics)
    - Area of a trapezoid
  - Areas of Regular Polygons and Similar Polygons (1 topics)
    - Side lengths, perimeters, and areas of similar polygons
  - Circumferences and Areas of Circles (8 topics)
    - Introduction to a circle: Diameter, radius, and chord
    - Circumference of a circle
    - Informal argument for the formula of the circumference of a circle
    - Area of a circle
    - Circumference and area of a circle
    - Circumference and area of a circle: Exact answers in terms of pi
    - Informal argument for the formula of the area of a circle
    - Informal argument for the formula of the area of a sector
  - Solids and Cross Sections (1 topics)
    - Classifying solids
  - Surface Areas of Prisms, Cylinders, and Cones (1 topics)
    - Surface area of a cube or a rectangular prism
  - Volumes of Prisms and Cylinders (8 topics)
    - Writing equivalent expressions for the volume of a rectangular prism
    - Volume of an oblique rectangular prism
    - Solving problems involving the volume of a rectangular prism in context
    - Volume of a cylinder
    - Informal argument for the formula of the volume of a cylinder
    - Volume of an oblique cylinder
    - Word problem involving the volume of a cylinder
    - Using cross sections to identify solids with the same volume
  - Volumes of Pyramids and Cones (4 topics)
    - Volume of a pyramid
    - Volume of a cone
    - Informal argument for the formula of the volume of a cone
    - Word problem involving the volume of a cone
  - Surface Areas and Volumes of Spheres (2 topics)
    - Volume of a sphere
    - Word problem involving the volume of a sphere
  - Similar Solids (2 topics)
    - Computing ratios of side lengths, surface areas, and volumes for similar solids
    - Computing side length, surface area, and volume for similar solids
  - Segments in a Circle and Tangent Lines (4 topics)
    - Identifying chords, secants, and tangents of a circle

- Tangents of a circle: Problem type 1
- Tangents of a circle: Problem type 2
- Constructing a tangent of a circle
- Chords and Arcs (4 topics)
  - Naming and finding measures of central angles, inscribed angles, and arcs of a circle
  - Applying properties of radii, diameters, and chords
  - Arc length
  - Computing ratios of arc lengths to radii and describing the result
- Inscribed Angles and Polygons (9 topics)
  - 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
- Angle and Segment Relationships in Circles (2 topics)
  - Angles of intersecting secants and tangents
  - Lengths of chords, secants, and tangents
- Sequences, Probability, and Conic Sections (47 topics)
  - Collecting and Displaying Data (4 topics)
    - Constructing a two-way frequency table: Basic
    - Constructing a two-way frequency table: Advanced
    - Computing a percentage from a table of values
    - Making an inference using a two-way frequency table
  - Counting (7 topics)
    - Introduction to the counting principle
    - Counting principle
    - Factorial expressions
    - Computing permutations and combinations
    - Introduction to permutations and combinations
    - Permutations and combinations: Problem type 1
    - Permutations and combinations: Problem type 2
  - Probability of Simple Events (4 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
  - Probability of Compound Events (20 topics)
    - Determining a sample space and outcomes for an event: Experiment involving multiple selections
    - Outcomes and event probability
    - 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
    - Determining outcomes for unions, intersections, and complements of events
    - 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
    - Probability of intersection or union: Word problems
    - Computing conditional probability using a sample space
    - 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
    - Computing conditional probability to make an inference using a two-way frequency table
    - Conditional probability: Basic
  - Simulations (1 topics)
    - Using a random number table to make a fair decision
  - Parabolas (2 topics)
    - Graphing a parabola of the form  $y^2 = ax$  or  $x^2 = ay$

- Deriving the equation of a parabola given its focus and directrix
- Circles (7 topics)
  - 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
  - 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 the endpoints of a diameter
- Nonlinear Systems (2 topics)
  - Graphically solving a system of linear and quadratic equations
  - Solving a system of linear and quadratic equations
- Trigonometry (16 topics)
  - Right Triangle Trigonometry (13 topics)
    - Sine, cosine, and tangent ratios: Numbers for side lengths
    - Using the Pythagorean Theorem to find several trigonometric ratios in a right triangle
    - Using a calculator to approximate sine, cosine, and tangent values
    - 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 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
    - Using trigonometry to find a length in a word problem with two right triangles
  - Trigonometric Functions of Angles (1 topics)
    - Finding values of trigonometric functions given information about an angle: Problem type 2
  - Laws of Sines and Cosines (1 topics)
    - Using trigonometry to find the area of a right triangle
  - Complex Numbers in Trigonometric Form (1 topics)
    - Plotting complex numbers
- Other Topics Available(\*) (889 additional topics)
  - Real Numbers (55 topics)
    - Greatest common factor of 3 numbers
    - Least common multiple of 2 numbers
    - Least common multiple of 3 numbers
    - The reciprocal of a number
    - Writing an improper fraction as a mixed number
    - Writing a mixed number as an improper fraction
    - Addition of mixed numbers with different denominators and renaming
    - Subtraction of mixed numbers with different denominators and renaming
    - Mixed number multiplication
    - Mixed number division
    - Addition of aligned decimals
    - Interpreting absolute values in context as distances from zero
    - Finding all numbers with a given absolute value
    - Signed fraction subtraction involving double negation
    - Signed fraction division
    - Signed decimal addition and subtraction
    - Signed decimal multiplication
    - Order of operations with whole numbers and grouping symbols
    - Order of operations with whole numbers and exponents: Advanced
    - Order of operations with fractions: Problem type 1
    - Order of operations with fractions: Problem type 2
    - Exponents and integers: Problem type 2
    - Evaluating an algebraic expression: Whole number operations and exponents
    - 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
    - Combining like terms: Fractional coefficients
    - Combining like terms: Decimal coefficients

- Distributive property: Fractional coefficients
- Properties of real numbers
- Identifying parts in an algebraic expression
- Identifying equivalent algebraic expressions
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Finding the missing side length of a rectilinear figure
- Perimeter of a piecewise rectangular figure
- Distinguishing between the area and perimeter of a rectangle
- Areas of rectangles with the same perimeter
- Finding the area of a rectilinear figure made from 2 or 3 rectangles
- Area between two rectangles
- Word problem involving the area between two rectangles
- U.S. Customary length conversion with whole number values
- Conversions involving measurements in feet and inches
- 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
- Writing ratios using different notations
- Writing a ratio as a percentage
  
- Linear Equations and Inequalities (89 topics)
  - Additive property of equality with signed fractions
  - Multiplicative property of equality with whole numbers: Fractional answers
  - Solving a multi-step equation given in fractional form
  - 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 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
  - Solving equations with zero, one, or infinitely many solutions
  - Translating a sentence into a multi-step equation
  - Solving a fraction word problem using a linear equation of the form  $Ax = B$
  - Writing an equation of the form  $A(x + B) = C$  to solve a word problem
  - Writing an equation to represent a real-world problem: Variable on both sides
  - Writing and solving a real-world problem given an equation with the variable on both sides
  - 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 fraction word problem using a linear equation with the variable on both sides
  - Solving a word problem with three unknowns using a linear equation
  - 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 one-step word problem using the formula  $d = rt$
  - Solving a distance, rate, time problem using a linear equation
  - Finding side lengths of squares given an area and a perimeter
  - Word problem on optimizing an area or perimeter
  - Finding the perimeter or area of a rectangle given one of these values
  - 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
  - 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
  - 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
  - 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
  - Solving a proportion of the form  $(x+a)/b = c/d$
  - Solving a proportion of the form  $a/(x+b) = c/x$
  - Word problem on proportions: Problem type 2
  - Finding the total cost including tax or markup
  - Finding the percentage increase or decrease: Basic
  - 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
- Introduction to solving an absolute value equation
- 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 into a one-step inequality
- Writing an inequality given a graph on the number line
- Additive property of inequality with signed fractions
- Additive property of inequality with signed decimals
- Multiplicative property of inequality with signed fractions
- Identifying solutions to a two-step linear inequality in one variable
- 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
- Writing, solving, and graphing the solution to a one-step inequality that models a real-world situation
- Solving a word problem using a one-step linear inequality
- Translating a sentence into a multi-step inequality
- Solving a word problem using a two-step linear inequality and describing the solution
- Solving a word problem using a two-step linear inequality
- Solving a decimal word problem using a two-step linear inequality
- Solving a decimal word problem using a linear inequality with the variable on both sides
- Writing sets of integers using set-builder and roster forms
- Union and intersection of finite sets
- 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
- Set-builder and interval notation
- 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 (57 topics)
  - Plotting points that share a coordinate and using absolute value to find the distance between them
  - 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
  - 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 equations of vertical and horizontal lines through a given point
  - Deriving the equation of a line through the origin
  - Deriving the equation of a line not going through the origin
  - 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
  - Finding inputs and outputs of a two-step function that models a real-world situation: Two variable equation
  - 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
  - Combining functions to write a new function that models a real-world situation
  - Graphing a linear function that models a simple interest situation and identifying key features
  - 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
  - Solving a linear equation by graphing
  - Constructing a scatter plot
  - 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
  - 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
  - Identifying outliers and clustering in scatter plots
  - Identifying correlation and causation
  - Interpreting direct variation from a graph
  - Word problem on inverse variation involving the completion of a task
  - Writing an equation that models variation
  - Word problem on combined variation
- Functions and Systems (94 topics)
    - Identifying functions from relations
    - Identifying functions given a verbal description
    - Vertical line test
    - Variable expressions as inputs of functions: Problem type 1
    - 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
    - Finding inputs and outputs of a function from its graph
    - 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 continuous function
    - Domain and range from the graph of a piecewise function
    - Finding intercepts of a nonlinear function given its 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 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
    - Classifying function types given equations of functions: Problem type 1
    - Classifying function types given equations of functions: Problem type 2
    - Translating the graph of a function: One step
    - Translating the graph of a function: Two steps
    - 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
    - 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
    - Identifying solutions to a system of linear equations
    - Classifying systems of linear equations from graphs
    - Graphing a system of linear equations and estimating a solution
    - Using a graphing calculator to solve a system of linear equations: Basic
    - Using a graphing calculator to solve a system of linear equations: Advanced
    - Writing a system of linear equations given its graph
    - Solving a system of linear equations using elimination with multiplication and addition
    - 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
  - Identifying the operations used to create equivalent systems of 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
  - 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
  - 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 involving a sum and another basic relationship using a system of linear equations
  - 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
  - Solving a word problem using a system of linear equations of the form  $y = mx + b$
  - Solving a value mixture problem using a system of linear equations
  - 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
  - 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
  - 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: Basic
  - 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
  - Writing a multi-step inequality for a real-world situation
  - Solving a word problem using a system of linear inequalities: Problem type 1
  - 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 (77 topics)
    - Understanding the product rule of exponents
    - Product rule with positive exponents: Multivariate
    - Ordering numbers with positive exponents
    - Understanding the power rules of exponents
    - Power rules with positive exponents: Multivariate products
    - Power rules with positive exponents: Multivariate quotients
    - Power and product rules with positive exponents
    - Simplifying a ratio of multivariate monomials: Basic
    - Quotient of expressions involving exponents
    - Simplifying a ratio of multivariate monomials: Advanced
    - Power and quotient rules with positive exponents
    - Power of 10: Negative exponent
    - Ordering numbers with negative exponents
    - Rewriting an algebraic expression without a negative exponent
    - Product rule with negative exponents
    - Quotient rule with negative exponents: Problem type 2
    - 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
    - Introduction to scientific notation with positive exponents
    - Scientific notation with a positive exponent

- Introduction to scientific notation with negative exponents
  - Scientific notation with a negative exponent
  - Converting between scientific notation and standard form in a real-world situation
  - Multiplying numbers written in scientific notation: Basic
  - Multiplying numbers written in scientific notation: Advanced
  - Multiplying numbers written in decimal form or scientific notation in a real-world situation
  - Dividing numbers written in scientific notation: Basic
  - Dividing numbers written in scientific notation: Advanced
  - Finding the scale factor between numbers given in scientific notation in a real-world situation
  - Adding or subtracting numbers written in scientific notation: Same exponents, basic
  - Adding or subtracting numbers written in scientific notation: Same exponents, advanced
  - Adding or subtracting numbers written in scientific notation: Different exponents
  - Estimating the sum or difference of two numbers written in scientific notation
  - Degree and leading coefficient of a univariate polynomial
  - Degree of a multivariate polynomial
  - Simplifying a sum or difference of three univariate polynomials
  - Simplifying a sum or difference of multivariate polynomials
  - Multiplying a univariate polynomial by a monomial with a negative coefficient
  - Multiplying a multivariate polynomial by a monomial
  - Multiplying binomials in two variables
  - Multiplying conjugate binomials: Multivariate
  - 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
  - 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 1
  - 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 quadratic with a negative leading coefficient
  - 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 one variable: Advanced
  - 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: Univariate
  - Dividing a polynomial by a monomial: Multivariate
  - Polynomial long division: Problem type 1
  - Polynomial long division: Problem type 2
  - Polynomial long division: Problem type 3
  - Synthetic division
  - Roots of a product of polynomials
  - Writing a quadratic equation given the roots and the leading coefficient
- Radicals (69 topics)
    - Finding all square roots of a number
    - Estimating a square root
    - Square roots of integers raised to even exponents
    - Order of operations with exponents and radicals
    - Finding  $n^{\text{th}}$  roots of perfect  $n^{\text{th}}$  powers with signs
    - Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power fraction
    - Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power monomial
    - 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
    - Domains of higher root functions
    - Graphing a square root function: Problem type 1
    - Graphing a square root function: Problem type 2
    - Graphing a square root function: Problem type 3
    - Rational exponents: Unit fraction exponents and bases involving signs
    - Rational exponents: Negative exponents and fractional bases

- Rational exponents: Products and quotients with negative exponents
- Rational exponents: Powers of powers with negative exponents
- Simplifying a radical expression with two variables
- Simplifying a higher root of a whole number
- Introduction to simplifying a higher radical expression
- Simplifying a higher radical expression: Univariate
- Simplifying a higher radical expression: Multivariate
- 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
- 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
- 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 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 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
- Solving an equation using the odd-root property: Problem type 1
- Dividing complex numbers
- Simplifying a power of  $i$
- Quadratic and Exponential Functions (40 topics)
  - Solving a quadratic equation using the square root property: Exact answers, basic
  - Solving a quadratic equation using the square root property: Exact answers, advanced
  - Solving a quadratic equation by completing the square: Exact answers
  - Deriving the quadratic formula
  - Discriminant of a quadratic equation with a parameter
  - 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
  - Writing the equation of a quadratic function given a real-world description
  - Word problem involving optimizing area by using a quadratic function
  - Range of a quadratic function
  - Solving a quadratic equation by graphing
  - Determining whether a given situation is best modeled by a linear, exponential, or quadratic function
  - Introduction to the composition of two functions
  - Composition of two functions: Basic
  - 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
  - Inverse functions: Linear, discrete
  - Finding, evaluating, and interpreting an inverse function for a given linear relationship
  - Even and odd functions: Problem type 1
  - Graphing an exponential function and its asymptote:  $f(x) = b^x$
  - Graphing an exponential function:  $f(x) = a(b)^x$
  - 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
  - Comparing linear, quadratic, and exponential functions given in different forms
  - Graphing an exponential function and finding its domain and range
  - Finding the initial amount and asymptote given a graph of an exponential function
  - 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
  - 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
  - Solving an exponential equation by finding common bases: Linear exponents
- Segments, Lines and Angles (51 topics)
    - Analyzing relationships between points, lines, and planes given a figure
    - Matching basic geometric terms with their definitions
    - Computing distances between decimals on a number line
    - Midpoint of a number line segment: Decimals
    - Using a segment's midpoint and endpoint to locate the other endpoint
    - Finding a point that partitions a number line segment in a given fractional relationship
    - Distance between two points in the plane: Decimal answers
    - Deriving the distance formula using the Pythagorean Theorem
    - Finding an endpoint of a line segment given the other endpoint and the midpoint
    - Deriving the midpoint formula on the coordinate plane using previous knowledge about midpoint on a number line
    - Finding a point that partitions a segment in the plane in a given fractional relationship
    - Finding the weighted average of two points on a line segment in the plane
    - Writing and solving an equation involving adjacent angles
    - Solving an equation involving complementary or supplementary angles
    - Writing and solving an equation involving complementary or supplementary angles
    - Angle addition and angle bisectors
    - Writing and solving an equation involving vertical angles
    - Constructing congruent angles
    - Making conjectures given a geometric construction
    - Identifying statements
    - Identifying simple and compound statements
    - Negation of a statement
    - Conditional statements and negations
    - Symbolic translation of negations, conjunctions, and disjunctions: Basic
    - Symbolic translation of conditional and biconditional statements: Basic
    - The converse, inverse, and contrapositive of a conditional statement
    - Writing the converse, inverse, and contrapositive of a conditional statement and determining their truth values
    - Writing a biconditional statement as a conditional statement and its converse and determining truth values
    - Finding counterexamples to conjectures
    - Symbolic translation of negations, conjunctions, and disjunctions: Advanced
    - Using De Morgan's Laws to identify negations and equivalent statements
    - Symbolic translation involving three statements
    - Symbolic translation of conditional and biconditional statements: Advanced
    - Understanding quantifiers
    - Negation of a quantified statement
    - Introduction to truth tables with negations, conjunctions, or disjunctions
    - Truth tables with conjunctions or disjunctions
    - Completing rows of truth tables: Conjunctions and disjunctions
    - Using logic to test a claim: Conjunction or disjunction
    - Introduction to truth tables with conditional statements
    - Truth tables with conjunctions, disjunctions, and conditional statements
    - Identifying equivalent statements and negations of a conditional statement
    - Using logic to test a claim: Conditional statement, basic
    - Determining if statements are logically equivalent
    - Introduction to truth tables with biconditional statements
    - Using truth tables to determine the validity of an argument
    - Conditional statements and deductive reasoning
    - Validity of an argument

- Translating an argument and determining its validity
- Distinguishing between undefined terms, definitions, postulates, conjectures, and theorems
- Constructing a pair of parallel lines
- Triangles and Other Polygons (44 topics)
  - Classifying scalene, isosceles, and equilateral triangles by side lengths
  - Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
  - Identifying coordinates that give right triangles
  - Identifying scalene, isosceles, and equilateral triangles given coordinates of their vertices
  - 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 and exterior angles of a triangle
  - Exploring the triangle congruence theorems
  - Proofs involving congruent triangles that overlap: Advanced
  - Finding an angle measure for a triangle sharing a side with another triangle
  - Finding angle measures of an isosceles triangle given angles with variables
  - 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
  - Demonstrating the converse of the Pythagorean Theorem
  - Informal proof of the converse of the Pythagorean Theorem
  - 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
  - Creating triangles from given side lengths: Problem type 2
  - Determining if a triangle is possible based on given angle measures
  - Determining if given measurements define a unique triangle, more than one triangle, or no triangle
  - Drawing triangles with given conditions: Angle measures
  - Drawing triangles with given conditions: Side lengths and angle measures
  - Drawing triangles with given side lengths using a compass
  - Using the hinge theorem
  - Indirect proof (proof by contradiction)
  - Informally deriving the formula for the sum of interior angles of polygons by decomposing them into triangles
  - Finding the sum of the interior angle measures of a convex polygon given the number of sides
  - Finding the number of sides of a convex polygon given the sum of the measures of the interior angles
  - Finding a missing interior angle measure in a convex polygon
  - Finding the measures of an interior angle and an exterior angle of a regular polygon
  - Finding the number of sides of a regular polygon given the measure of an interior angle
  - Investigating properties of diagonals of parallelograms
  - Conditions for parallelograms
  - Conditions for quadrilaterals
  - Drawing and identifying a polygon in the coordinate plane
  - Finding the coordinates of a point to make a parallelogram
  - Finding coordinates of vertices of polygons
  - Congruence in the coordinate plane
- Similarity and Transformations (43 topics)
  - Relationships about ratios within and between similar triangles
  - Triangles and angle bisectors
  - Proving the slope criterion for parallel or perpendicular lines
  - Reproducing a scale drawing at a different scale
  - Special right triangles: Decimal answers
  - Properties of translated figures
  - Translating a polygon
  - Using a translated point to find coordinates of other translated points
  - Understanding the definition of a translation
  - 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
  - Understanding the definition of a reflection
  - 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
  - Understanding the definition of a rotation
  - 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
  - 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
  - Identifying transformations that map a quadrilateral onto itself
  - Identifying transformations that map a regular polygon onto itself
  - Determining if figures are congruent and related by a transformation
  - Determining if figures are congruent and related by a sequence of transformations
  - Finding a scale factor given a dilation in the coordinate plane
  - The effect of dilation on area
  - Writing a rule to describe a dilation
  - Determining if figures are similar and related by a sequence of transformations
  - Identifying transformations and determining if they preserve congruent figures
- Area, Volume, and Circles (72 topics)
    - Word problem on population density
    - 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 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
    - Investigating the effects on the area for non-proportional and proportional figures
    - Finding the radius or the diameter of a circle given its circumference
    - Circumference ratios
    - Perimeter involving rectangles and circles
    - Distinguishing between the area and circumference 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 pi
    - Vertices, edges, and faces of a solid
    - Identifying geometric shapes that model real-world objects
    - Nets of solids
    - Counting the cubes in a solid made of cubes
    - Side views of a solid made of cubes
    - Identifying horizontal and vertical cross sections of solids
    - Identifying solids generated by rotations of two-dimensional regions
    - Identifying properties of Euclidean and spherical geometries
    - 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
    - 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
    - Surface area of a cylinder
    - Surface area of a cylinder: Exact answers in terms of pi
    - Deriving the formula for the surface area of a cylinder
    - 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 pi
    - Volume of a rectangular prism made of unit cubes

- Volume of a rectangular prism with fractional edge lengths
  - Distinguishing between surface area and volume
  - Word problem involving the rate of filling or emptying a rectangular prism
  - Computations involving density, mass, and volume
  - Word problem on density involving the volume of a rectangular solid
  - 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
  - Describing the formula for 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
  - 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: Exact answers in terms of  $\pi$
  - Relating the volumes of a cylinder and a cone
  - Surface area of a sphere
  - Identifying similar solids
  - Word problem involving volumes of similar solids
  - Arc length and area of a sector of a circle
- Sequences, Probability, and Conic Sections (118 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
    - 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 next terms of an arithmetic sequence with integers
    - 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 the first terms
    - Finding a specified term of an arithmetic sequence given the common difference and first term
    - 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
    - Finding the next terms of a geometric sequence with signed numbers
    - Identifying arithmetic and geometric sequences
    - 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
    - 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 the first  $n$  terms of a geometric sequence
    - Sum of an infinite geometric series
    - Identifying linear, quadratic, and exponential functions given ordered pairs
    - Identifying statistical questions
    - Choosing an appropriate method for gathering data: Problem type 1
    - Choosing an appropriate method for gathering data: Problem type 2
    - Introduction to expectation
    - Calculating relative frequencies in a contingency table
    - Calculating relative frequencies in a contingency table: Advanced
    - Representing data on a dot plot
    - Constructing a frequency distribution and a histogram
    - Interpreting a histogram
    - Interpreting a stem-and-leaf plot
    - Constructing a stem-and-leaf plot
    - Finding a percentage of a total amount in a circle graph
    - Angle measure in a circle graph
    - Mode of a data set
    - Range of a data set
    - Interpreting a percent bar graph to summarize categorical data using the mode
    - 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
    - Finding the value for a new score that will yield a given mean
    - Weighted mean
    - Mean and median of a data set
    - How changing a value affects the mean and median
    - Finding outliers in a data set
    - Choosing the best measure to describe data
    - Identifying the center, spread, and shape of a data set

- Percentage of data below a specified value
- 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: Problem type 1
- Interpreting a box-and-whisker plot: Problem type 2
- Constructing a box-and-whisker plot
- Using box-and-whisker plots to compare data sets
- Computing mean absolute deviation from a list of numerical values
- Population standard deviation
- Interpreting a tree diagram
- Counting principle with repetition allowed
- Counting arrangements of objects that are not all distinct
- Permutations and combinations: Problem type 3
- Probabilities of an event and its complement
- Experimental and theoretical probability
- Finding the odds in favor and against
- Area as probability
- Experimental and theoretical probability for compound events
- Probabilities involving two rolls of a die
- Probability of dependent events: Decimal answers
- Probabilities of draws with replacement
- Probabilities of draws without replacement
- Computing probability involving the addition rule using a two-way frequency table
- 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
- Generating random samples from a population with known characteristics
- 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
- 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  $ax^2 + bx + cy + d = 0$
- 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 general form: Advanced
- Writing an equation of a circle given its center and a point on the circle
- 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
- Using a graphing calculator to solve a nonlinear system of equations: Basic
- 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
- Trigonometry (80 topics)
  - Sine, cosine, and tangent ratios: Variables for side lengths
  - Converting degrees-minutes-seconds to decimal degrees
  - Converting decimal degrees to degrees-minutes-seconds
  - Converting between degree and radian measure: Problem type 1
  - Converting between degree and radian measure: Problem type 2

- Sketching an angle with absolute value less than  $2\pi$  radians in standard position
- Coterminal angles
- Arc length and central angle measure
- Area of a sector of a circle
- Finding coordinates on the unit circle for special angles
- Trigonometric functions and special angles: Problem type 1
- Finding values of trigonometric functions from a point on the unit circle
- Trigonometric functions and special angles: Problem type 2
- 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 3
- Values of inverse trigonometric functions
- 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 triangle
- Expressing the area of a triangle in terms of the sine of one of its angles
- Simplifying trigonometric expressions
- Using cofunction identities
- Verifying a trigonometric identity
- Proving trigonometric identities: Problem type 1
- Sum and difference identities: Problem type 1
- Sum and difference identities: Problem type 2
- Double-angle identities: Problem type 1
- Half-angle identities: Problem type 1
- 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
- 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
- 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
- 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

**\*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.