



Trigonometry

This course covers the topics outlined below. You can customize the scope and sequence of this course to meet your curricular needs.

Curriculum Show All (465 topics + 533 additional topics)

- Algebra and Geometry Review (98 topics)
 - ◆ Real Numbers and Algebraic Expressions (14 topics)
 - ◇ Signed fraction addition or subtraction: Basic
 - ◇ Signed fraction subtraction involving double negation
 - ◇ Signed fraction multiplication: Basic
 - ◇ Signed fraction division
 - ◇ Computing the distance between two integers on a number line
 - ◇ Exponents and integers: Problem type 1
 - ◇ Exponents and signed fractions
 - ◇ Order of operations with integers
 - ◇ Evaluating a linear expression: Integer multiplication with addition or subtraction
 - ◇ Evaluating a quadratic expression: Integers
 - ◇ Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
 - ◇ Distributive property: Integer coefficients
 - ◇ Using distribution and combining like terms to simplify: Univariate
 - ◇ Using distribution with double negation and combining like terms to simplify: Multivariate
 - ◆ Exponents (9 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
 - ◇ Power rules with positive exponents: Multivariate products
 - ◇ Power rules with positive exponents: Multivariate quotients
 - ◇ Simplifying a ratio of multivariate monomials: Basic
 - ◇ Introduction to the quotient rule of exponents
 - ◇ Simplifying a ratio of univariate monomials
 - ◆ Polynomial Expressions (8 topics)
 - ◇ Simplifying a sum or difference of two univariate polynomials
 - ◇ Multiplying a univariate polynomial by a monomial with a positive coefficient
 - ◇ Multiplying a univariate polynomial by a monomial with a negative coefficient
 - ◇ Multiplying binomials with leading coefficients of 1
 - ◇ Multiplying binomials with leading coefficients greater than 1
 - ◇ Multiplying conjugate binomials: Univariate
 - ◇ Squaring a binomial: Univariate
 - ◇ Multiplying binomials with negative coefficients
 - ◆ Factoring Polynomials (11 topics)
 - ◇ Greatest common factor of 2 numbers
 - ◇ Factoring a linear binomial
 - ◇ Introduction to the GCF of two monomials
 - ◇ Factoring out a monomial from a polynomial: Univariate

- ◇ Factoring a quadratic with leading coefficient 1
- ◇ Factoring out a constant before factoring a quadratic
- ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 1
- ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- ◇ Factoring a perfect square trinomial with leading coefficient 1
- ◇ Factoring a difference of squares in one variable: Basic
- ◇ Factoring a difference of squares in one variable: Advanced
- ◆ Rational Expressions (28 topics)
 - ◇ Restriction on a variable in a denominator: Linear
 - ◇ Simplifying a ratio of factored polynomials: Linear factors
 - ◇ Simplifying a ratio of polynomials using GCF factoring
 - ◇ Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
 - ◇ Simplifying a ratio of polynomials: Problem type 1
 - ◇ Multiplying rational expressions involving linear expressions
 - ◇ Multiplying rational expressions involving quadratics with leading coefficients of 1
 - ◇ Dividing rational expressions involving linear expressions
 - ◇ Dividing rational expressions involving quadratics with leading coefficients of 1
 - ◇ Least common multiple of 2 numbers
 - ◇ Least common multiple of 3 numbers
 - ◇ Introduction to the LCM of two monomials
 - ◇ Finding the LCD of rational expressions with linear denominators: Relatively prime
 - ◇ Writing equivalent rational expressions with polynomial denominators
 - ◇ Introduction to adding fractions with variables and common denominators
 - ◇ Adding rational expressions with common denominators and monomial numerators
 - ◇ Adding rational expressions with common denominators and binomial numerators
 - ◇ Adding rational expressions with common denominators and GCF factoring
 - ◇ Adding rational expressions with common denominators and quadratic factoring
 - ◇ Adding rational expressions with different denominators and a single occurrence of a variable
 - ◇ Adding rational expressions with denominators ax and bx : Basic
 - ◇ Adding rational expressions with denominators ax and bx : Advanced
 - ◇ Adding rational expressions with linear denominators without common factors: Basic
 - ◇ Complex fraction without variables: Problem type 1
 - ◇ Complex fraction without variables: Problem type 2
 - ◇ Complex fraction involving univariate monomials
 - ◇ Complex fraction: GCF factoring
 - ◇ Complex fraction made of sums involving rational expressions: Problem type 1
- ◆ Perfect Squares and nth Roots (6 topics)
 - ◇ Finding all square roots of a number
 - ◇ Square root of a rational perfect square
 - ◇ Square roots of perfect squares with signs
 - ◇ Introduction to solving an absolute value equation
 - ◇ Cube root of an integer
 - ◇ Finding n^{th} roots of perfect n^{th} powers with signs
- ◆ Rational Exponents (2 topics)
 - ◇ Rational exponents: Unit fraction exponents and whole number bases
 - ◇ Rational exponents: Non-unit fraction exponent with a whole number base
- ◆ Radical Expressions (15 topics)
 - ◇ Simplifying the square root of a whole number less than 100
 - ◇ Simplifying a higher root of a whole number
 - ◇ Introduction to square root addition or subtraction
 - ◇ Square root addition or subtraction
 - ◇ Introduction to square root multiplication
 - ◇ Square root multiplication: Basic

- ◇ Square root multiplication: Advanced
- ◇ 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
- ◇ Simplifying a quotient of square roots
- ◇ Simplifying a quotient involving a sum or difference with a square root
- ◇ Rationalizing a denominator: Quotient involving square roots
- ◇ Rationalizing a denominator: Square root of a fraction
- ◇ Rationalizing a denominator using conjugates: Integer numerator
- ◆ Geometry (5 topics)
 - ◇ Area of a triangle
 - ◇ Circumference of a circle
 - ◇ Circumference and area of a circle
 - ◇ Introduction to the Pythagorean Theorem
 - ◇ Pythagorean Theorem
- Equations and Inequalities (55 topics)
 - ◆ Linear Equations and Applications (19 topics)
 - ◇ Additive property of equality with signed fractions
 - ◇ Multiplicative property of equality with signed fractions
 - ◇ Solving a multi-step equation given in fractional form
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
 - ◇ Solving a two-step equation with signed fractions
 - ◇ Solving a proportion of the form $(x+a)/b = c/d$
 - ◇ Solving for a variable in terms of other variables using addition or subtraction: Basic
 - ◇ 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: Basic
 - ◇ Solving for a variable in terms of other variables using multiplication or division: Advanced
 - ◇ Solving for a variable in terms of other variables using addition or subtraction with division
 - ◇ Solving for a variable inside parentheses in terms of other variables
 - ◇ Solving for a variable in terms of other variables in a linear equation with fractions
 - ◇ Translating a sentence into a one-step equation
 - ◇ Solving a word problem with two unknowns using a linear equation
 - ◇ Solving a decimal word problem using a linear equation of the form $Ax + B = C$
 - ◇ Solving a one-step word problem using the formula $d = rt$
 - ◆ Linear Inequalities and Applications (5 topics)
 - ◇ Graphing a linear inequality on the number line
 - ◇ Graphing a compound inequality on the number line
 - ◇ Set-builder and interval notation
 - ◇ Solving a two-step linear inequality: Problem type 1
 - ◇ Solving a two-step linear inequality: Problem type 2
 - ◆ Rational Equations that Simplify to Linear (5 topics)
 - ◇ Solving a rational equation that simplifies to linear: Denominator x
 - ◇ Solving a rational equation that simplifies to linear: Denominator $x+a$
 - ◇ Solving for a variable in terms of other variables in a rational equation: Problem type 1
 - ◇ Solving for a variable in terms of other variables in a rational equation: Problem type 2
 - ◇ Word problem on proportions: Problem type 1
 - ◆ Complex Numbers (5 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
 - ◇ Dividing complex numbers
- ◆ Quadratic Equations (13 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 an equation of the form $x^2 = a$ using the square root property
 - ◇ Solving a quadratic equation using the square root property: Exact answers, basic
 - ◇ Solving a quadratic equation using the square root property: Exact answers, advanced
 - ◇ Completing the square
 - ◇ Applying the quadratic formula: Exact answers
 - ◇ Applying the quadratic formula: Decimal answers
 - ◇ Solving a word problem using a quadratic equation with irrational roots
 - ◇ Solving an equation using the odd-root property: Problem type 1
 - ◇ Solving an equation using the odd-root property: Problem type 2
- ◆ Rational Equations that Simplify to Quadratic (1 topics)
 - ◇ Restriction on a variable in a denominator: Quadratic
- ◆ Radical Equations (7 topics)
 - ◇ Introduction to solving a radical equation
 - ◇ Solving a radical equation that simplifies to a linear equation: One radical, basic
 - ◇ Solving a radical equation that simplifies to a linear equation: One radical, advanced
 - ◇ Solving a radical equation that simplifies to a linear equation: Two radicals
 - ◇ Solving for a variable in terms of other variables in an equation involving radicals
 - ◇ 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
- Graphs and Functions (101 topics)
 - ◆ The Coordinate Plane, Distance, and Midpoint (8 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 coordinates
 - ◇ Naming the quadrant or axis of a point given the signs of its coordinates
 - ◇ Table for a linear equation
 - ◇ Distance between two points in the plane: Exact answers
 - ◇ Identifying solutions to a linear equation in two variables
 - ◇ Finding a solution to a linear equation in two variables
 - ◆ Graphs of Equations (13 topics)
 - ◇ 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
 - ◇ Graphing a line by first finding its x- and y-intercepts
 - ◇ Finding intercepts of a nonlinear function given its graph
 - ◇ Graphing an absolute value equation of the form $y = A|x|$
 - ◇ Graphing a parabola of the form $y = ax^2$
 - ◇ Graphing a parabola of the form $y = ax^2 + c$
 - ◇ Graphing a cubic function of the form $y = ax^3$
 - ◆ Slope and Equations of Lines (9 topics)

- ◊ Finding slope given the graph of a line on a grid
- ◊ Finding slope given two points on a line
- ◊ Finding the slopes of horizontal and vertical lines
- ◊ 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
- ◊ 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
- ◆ Linear Applications (3 topics)
 - ◊ 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: Advanced
 - ◊ Finding the intercepts and rate of change given a graph of a linear function
- ◆ Systems of Equations (3 topics)
 - ◊ Graphically solving a system of linear equations
 - ◊ Using a graphing calculator to solve a system of linear equations: Basic
 - ◊ Solving a system of linear equations using substitution
- ◆ Circles (2 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
- ◆ Functions (18 topics)
 - ◊ Identifying functions from relations
 - ◊ Vertical line test
 - ◊ Table for a linear function
 - ◊ Evaluating functions: Linear and quadratic or cubic
 - ◊ Evaluating a rational function: Problem type 1
 - ◊ Evaluating a rational function: Problem type 2
 - ◊ Table for a square root function
 - ◊ Variable expressions as inputs of functions: Problem type 1
 - ◊ Variable expressions as inputs of functions: Problem type 2
 - ◊ Variable expressions as inputs of functions: Problem type 3
 - ◊ Domain and range from ordered pairs
 - ◊ Domain of a rational function: Excluded values
 - ◊ Domain of a rational function: Interval notation
 - ◊ Domain of a square root function: Basic
 - ◊ Domain of a square root function: Advanced
 - ◊ Finding outputs of a one-step function that models a real-world situation: Function notation
 - ◊ 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 inputs and outputs of a function from its graph
 - ◊ Domain and range from the graph of a continuous function
 - ◊ Finding where a function is increasing, decreasing, or constant given the graph
 - ◊ Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
 - ◊ Finding local maxima and minima of a function given the graph
 - ◊ Finding the absolute maximum and minimum of a function given the graph
 - ◊ Finding values and intervals where the graph of a function is zero, positive, or negative
 - ◊ 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: Basic

- ◊ Graphing an absolute value equation in the plane: Advanced
- ◊ Graphing a function of the form $f(x) = ax^2$
- ◊ Graphing a function of the form $f(x) = ax^2 + c$
- ◊ Graphing a parabola of the form $y = (x-h)^2 + k$
- ◊ Graphing a square root function: Problem type 1
- ◊ Graphing a square root function: Problem type 2
- ◊ Matching parent graphs with their equations
- ◆ Transformations (12 topics)
 - ◊ Translating the graph of a parabola: One step
 - ◊ Translating the graph of a parabola: Two steps
 - ◊ Translating the graph of an absolute value function: One step
 - ◊ Translating the graph of an absolute value function: Two steps
 - ◊ Writing an equation for a function after a vertical translation
 - ◊ Translating the graph of a function: One step
 - ◊ Translating the graph of a function: Two steps
 - ◊ Transforming the graph of a 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
- ◆ Combining Functions; Composite Functions; Inverse Functions (10 topics)
 - ◊ Introduction to the composition of two functions
 - ◊ Composition of two functions: Basic
 - ◊ Horizontal line test
 - ◊ Determining whether two functions are inverses of each other
 - ◊ Inverse functions: Linear, discrete
 - ◊ Inverse functions: Quadratic, square root
 - ◊ Inverse functions: Cubic, cube root
 - ◊ Inverse functions: Rational
 - ◊ Graphing the inverse of a function given its graph
 - ◊ Finding, evaluating, and interpreting an inverse function for a given linear relationship
- ◆ Quadratic Functions (5 topics)
 - ◊ Graphing a parabola of the form $y = x^2 + bx + c$
 - ◊ Graphing a parabola of the form $y = a(x-h)^2 + k$
 - ◊ Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
 - ◊ Finding the maximum or minimum of a quadratic function
 - ◊ Word problem involving the maximum or minimum of a quadratic function
- Trigonometric Functions (48 topics)
 - ◆ Angles and Their Measure (12 topics)
 - ◊ Converting degrees–minutes–seconds to decimal degrees
 - ◊ Converting decimal degrees to degrees–minutes–seconds
 - ◊ Converting degrees to radians and radians to degrees: Problem type 1
 - ◊ Converting degrees to radians and radians to degrees: Problem type 2
 - ◊ Sketching an angle with absolute value less than 360 degrees in standard position
 - ◊ Sketching an angle with absolute value less than 2 radians in standard position
 - ◊ Coterminal angles
 - ◊ Arc length and central angle measure
 - ◊ Relating an angle and an arc length in a real–world situation
 - ◊ Area of a sector of a circle
 - ◊ Using the area formula for a sector of a circle in a real–world situation
 - ◊ Angular and linear speed
 - ◆ The Unit Circle and Evaluating Trigonometric Functions (13 topics)
 - ◊ Finding coordinates on the unit circle for special angles

- ◊ Finding a point on the unit circle given one coordinate and the quadrant
- ◊ Special triangles with a hypotenuse of length 1
- ◊ Drawing a reference triangle on the unit circle and using it to derive values of trigonometric functions: Radians
- ◊ Trigonometric functions and special angles: Problem type 1: Degrees
- ◊ Trigonometric functions and special angles: Problem type 1: Radians
- ◊ 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 expressions involving sine or cosine
- ◊ Odd and even identities for trigonometric functions
- ◊ Using a calculator to approximate sine, cosine, and tangent values
- ◊ Evaluating a sinusoidal function that models a real-world situation
- ◆ Right Triangle Trigonometry (11 topics)
 - ◊ Special right triangles: Exact answers
 - ◊ Sine, cosine, and tangent ratios: Variables for side lengths
 - ◊ Using the Pythagorean Theorem to find a sine, cosine, or tangent ratio in a right triangle
 - ◊ Using the Pythagorean Theorem to find several trigonometric ratios in a right triangle
 - ◊ 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 trigonometric functions and the formula $d = rt$ in a real-world situation
 - ◊ 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 (12 topics)
 - ◊ Sketching an angle with absolute value less than 360 degrees, and also its reference angle
 - ◊ Reference angles in degrees: Problem type 1
 - ◊ Reference angles in degrees: Problem type 2
 - ◊ Sketching an angle with absolute value less than 2 radians, and also its reference angle
 - ◊ Reference angles in radians: Problem type 1
 - ◊ Sketching an angle with absolute value greater than 2 radians, and also its reference angle
 - ◊ Reference angles in radians: Problem type 2
 - ◊ Determining the location of a terminal point given the signs of trigonometric values
 - ◊ Finding values of trigonometric functions given information about an angle: Problem type 1
 - ◊ Finding values of trigonometric functions given information about an angle: Problem type 2
 - ◊ Finding values of trigonometric functions given information about an angle: Problem type 3
 - ◊ Finding values of trigonometric functions given information about an angle: Problem type 4
- Trigonometric Graphs (29 topics)
 - ◆ Graphs of Sine and Cosine Functions (23 topics)
 - ◊ Sketching the graph of $y = a \sin(x)$ or $y = a \cos(x)$
 - ◊ Sketching the graph of $y = \sin(bx)$ or $y = \cos(bx)$
 - ◊ Using transformations to graph $y = \sin(bx)$ or $y = \cos(bx)$
 - ◊ Sketching the graph of $y = \sin(x) + d$ or $y = \cos(x) + d$
 - ◊ Using transformations to graph $y = \sin(x) + d$ or $y = \cos(x) + d$
 - ◊ Using transformations to graph $y = a \sin(x) + d$ or $y = a \cos(x) + d$
 - ◊ Using transformations to graph $y = \sin(bx) + d$ or $y = \cos(bx) + d$
 - ◊ Sketching the graph of $y = \sin(x+c)$ or $y = \cos(x+c)$
 - ◊ Sketching the graph of $y = a \sin(x+c)$ or $y = a \cos(x+c)$
 - ◊ Using transformations to graph $y = a \sin(x+c) + d$ or $y = a \cos(x+c) + d$
 - ◊ Sketching the graph of $y = a \sin(bx)$ or $y = a \cos(bx)$
 - ◊ Using transformations to graph $y = \sin(bx+c)$ or $y = \cos(bx+c)$
 - ◊ Sketching the graph of $y = a \sin(bx+c)$ or $y = a \cos(bx+c)$

- ◊ Sketching the graph of $y = a \sin(bx) + d$ or $y = a \cos(bx) + d$
- ◊ Using transformations to graph $y = a \sin(bx+c) + d$ or $y = a \cos(bx+c) + d$
- ◊ Amplitude and period of a sine or cosine function
- ◊ Amplitude, period, and phase shift of a sine or cosine function
- ◊ Interpreting the graph of a sinusoidal function that models a real-world situation
- ◊ Writing the equation of a sine or cosine function given its graph: Problem type 1
- ◊ Writing the equation of a sine or cosine function given its graph: Problem type 2
- ◊ Word problem involving a sine or cosine function: Problem type 1
- ◊ Developing a sinusoidal model for a real-world situation
- ◊ Word problem involving a sine or cosine function: Problem type 2
- ◆ Graphs of Other Trigonometric Functions (6 topics)
 - ◊ Domains and ranges of trigonometric functions
 - ◊ Matching graphs and equations for secant, cosecant, tangent, and cotangent functions
 - ◊ Sketching the graph of a secant or cosecant function: Problem type 1
 - ◊ Sketching the graph of a secant or cosecant function: Problem type 2
 - ◊ Sketching the graph of a tangent or cotangent function: Problem type 2
 - ◊ Sketching the graph of a tangent or cotangent function: Problem type 1
- Trigonometric Identities and Equations (64 topics)
 - ◆ Inverse Trigonometric Functions (9 topics)
 - ◊ Values of inverse trigonometric functions
 - ◊ Composition of a trigonometric function with its inverse trigonometric function: Problem type 1
 - ◊ Composition of a trigonometric function with its inverse trigonometric function: Problem type 2
 - ◊ Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 1
 - ◊ Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 2
 - ◊ Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 3
 - ◊ Composition of trigonometric functions with variable expressions as inputs: Problem type 1
 - ◊ Composition of trigonometric functions with variable expressions as inputs: Problem type 2
 - ◊ Using a calculator to approximate inverse trigonometric values
 - ◆ Verifying Trigonometric Identities (14 topics)
 - ◊ Using reciprocal and quotient identities to simplify a trigonometric expression
 - ◊ Using Pythagorean identities to simplify a trigonometric expression
 - ◊ Using cofunction identities
 - ◊ Verifying a trigonometric identity: Problem type 1
 - ◊ Verifying a trigonometric identity: Problem type 2
 - ◊ Verifying a trigonometric identity: Problem type 3
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 1
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 2
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 3
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 4
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 5
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 6
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 7
 - ◊ Proving trigonometric identities using odd and even identities
 - ◆ Sum and Difference Formulas (9 topics)
 - ◊ Sum and difference identities: Problem type 1: Degrees
 - ◊ Sum and difference identities: Problem type 1: Radians
 - ◊ Sum and difference identities: Problem type 2: Degrees
 - ◊ Sum and difference identities: Problem type 2: Radians
 - ◊ Sum and difference identities: Problem type 3
 - ◊ Sum and difference identities: Problem type 4

- ◊ Proving trigonometric identities using sum and difference identities: Problem type 1
- ◊ Proving trigonometric identities using sum and difference identities: Problem type 2
- ◊ Proving trigonometric identities using sum and difference identities: Problem type 3
- ◆ Double–Angle, Half–Angle, and Product–to–Sum Formulas (11 topics)
 - ◊ Double–angle identities: Problem type 1
 - ◊ Double–angle identities: Problem type 2
 - ◊ Power–reducing identities
 - ◊ Half–angle identities: Problem type 1: Degrees
 - ◊ Half–angle identities: Problem type 1: Radians
 - ◊ Half–angle identities: Problem type 2
 - ◊ Product–to–sum and sum–to–product identities: Problem type 1: Degrees
 - ◊ Product–to–sum and sum–to–product identities: Problem type 1: Radians
 - ◊ Product–to–sum and sum–to–product identities: Problem type 2
 - ◊ Proving trigonometric identities using double–angle identities: Problem type 1
 - ◊ Proving trigonometric identities using double–angle identities: Problem type 2
- ◆ Trigonometric Equations (21 topics)
 - ◊ 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
 - ◊ 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 involving sine and cosine and written in factored form
 - ◊ Finding solutions in an interval for a trigonometric equation written in factored form
 - ◊ Finding solutions in an interval for a trigonometric equation involving a squared function: Problem type 1
 - ◊ Factoring to find solutions in an interval for a trigonometric equation involving sine or cosine
 - ◊ Factoring to find solutions in an interval for a trigonometric equation
 - ◊ Using a Pythagorean identity to find solutions in an interval for a trigonometric equation involving sine and cosine: Problem type 1
 - ◊ Using a Pythagorean identity to find solutions in an interval for a trigonometric equation: Problem type 1
 - ◊ Finding solutions in an interval for a trigonometric equation involving sine and/or cosine using double–angle identities
 - ◊ Solving a trigonometric equation modeling a real–world situation
 - ◊ Using a graphing calculator to solve a trigonometric equation
 - ◊ Solving a trigonometric equation involving a squared function: Problem type 1
 - ◊ Solving a trigonometric equation involving a squared function: Problem type 2
 - ◊ Solving a trigonometric equation involving an angle multiplied by a constant
 - ◊ Finding solutions in an interval for a trigonometric equation involving sine or cosine and an angle multiplied by a constant
 - ◊ Finding solutions in an interval for a trigonometric equation involving an angle multiplied by a constant
 - ◊ Finding solutions in an interval for a trigonometric equation involving sine and cosine using sum and difference identities
- Triangles and Vectors (35 topics)
 - ◆ Laws of Sines and Cosines (9 topics)
 - ◊ Solving a triangle with the law of sines: Problem type 1
 - ◊ Solving a triangle with the law of sines: Problem type 2
 - ◊ Solving a word problem using the law of sines
 - ◊ Solving a triangle with the law of cosines
 - ◊ Solving a word problem using the law of cosines

- ◊ Solving a word problem using the law of sines and the law of cosines
- ◊ Using trigonometry to find the area of a right triangle
- ◊ Using trigonometry to find the area of a triangle
- ◊ Heron's formula
- ◆ Vectors (19 topics)
 - ◊ Writing a position vector in $ai+bj$ form given its graph
 - ◊ Writing a vector in $ai+bj$ form given its initial and terminal points
 - ◊ Writing a vector in component form given its initial and terminal points
 - ◊ Magnitude of a vector given in $ai+bj$ form
 - ◊ Magnitude of a vector given in component form
 - ◊ Vector addition and scalar multiplication: $ai+bj$ form
 - ◊ Linear combination of vectors: $ai+bj$ form
 - ◊ Vector addition and scalar multiplication: Component form
 - ◊ Linear combination of vectors: Component form
 - ◊ Unit vectors
 - ◊ 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 the direction angle of a vector given in $ai+bj$ form
 - ◊ Writing a vector given its magnitude and direction angle
 - ◊ Writing a vector to represent a force pushing or pulling an object
 - ◊ Finding the magnitude and direction angle of the resultant force of two vectors
- ◆ The Dot Product (7 topics)
 - ◊ Dot product of vectors given in $ai+bj$ form
 - ◊ Dot product of vectors given in component form
 - ◊ Finding the angle between two vectors given in component form
 - ◊ Classifying vector relationships by finding the angle between two vectors given in $ai + bj$ form
 - ◊ Decomposing a vector into two orthogonal vectors
 - ◊ Finding the amount of work done given a force vector and a distance
 - ◊ Finding magnitudes of forces related to an object on a ramp
- Polar Coordinates and Complex Numbers (22 topics)
 - ◆ Polar Coordinates and Equations (7 topics)
 - ◊ Plotting points in polar coordinates
 - ◊ Multiple representations of polar coordinates
 - ◊ Converting rectangular coordinates to polar coordinates: Special angles
 - ◊ Converting polar coordinates to rectangular coordinates
 - ◊ Converting an equation written in rectangular form to one written in polar form
 - ◊ Converting an equation written in polar form to one written in rectangular form: Problem type 1
 - ◊ Converting an equation written in polar form to one written in rectangular form: Problem type 2
 - ◆ Graphs of Polar Equations (6 topics)
 - ◊ Graphing a polar equation: Basic
 - ◊ Graphing a polar equation: Circle
 - ◊ Graphing a polar equation: Limacon
 - ◊ Graphing a polar equation: Rose
 - ◊ Graphing a polar equation: Lemniscate
 - ◊ Matching polar equations with their graphs
 - ◆ Complex Numbers and De Moivre's Theorem (9 topics)
 - ◊ Plotting complex numbers
 - ◊ Writing a complex number in standard form given its trigonometric form
 - ◊ Writing a complex number in trigonometric form: Special angles
 - ◊ Writing a complex number in trigonometric form: Decimal answers

- ◇ Multiplying and dividing complex numbers in trigonometric form
 - ◇ De Moivre's Theorem: Answers in trigonometric form
 - ◇ De Moivre's Theorem: Answers in standard form
 - ◇ Finding the nth roots of a number: Problem type 1
 - ◇ Finding the nth roots of a number: Problem type 2
- Conic Sections (13 topics)
 - ◆ Parabolas (2 topics)
 - ◇ Graphing a parabola of the form $y^2 = ax$ or $x^2 = ay$
 - ◇ Graphing a parabola of the form $x = a(y-k)^2 + h$ or $y = a(x-h)^2 + k$
 - ◆ Ellipses (1 topics)
 - ◇ Graphing an ellipse given its equation in standard form
 - ◆ Parametric Equations (10 topics)
 - ◇ Completing a table and choosing a graph given a pair of parametric equations
 - ◇ Writing the equation of a line and sketching its graph given its parametric equations
 - ◇ Writing the equation of a parabola and sketching its graph given its parametric equations
 - ◇ Writing the equation of a circle or ellipse and sketching its graph given its parametric equations
 - ◇ Graphing a pair of parametric equations with a restricted domain: Line or parabola
 - ◇ Graphing a pair of parametric equations with a restricted domain: Circle
 - ◇ Graphing a pair of parametric equations with a restricted domain: Ellipse
 - ◇ Completing pairs of parametric equations
 - ◇ Word problem involving parametric equations for projectile motion: Problem type 1
 - ◇ Word problem involving parametric equations for projectile motion: Problem type 2
- Other Topics Available(*) (533 additional topics)
 - ◆ Algebra and Geometry Review (182 topics)
 - ◇ Fractional position on a number line
 - ◇ Plotting rational numbers on a number line
 - ◇ Ordering integers
 - ◇ Estimating a square root
 - ◇ Ordering real numbers
 - ◇ Identifying numbers as integers or non-integers
 - ◇ Identifying numbers as rational or irrational
 - ◇ Signed fraction addition or subtraction: Advanced
 - ◇ Addition and subtraction of 3 fractions involving signs
 - ◇ Signed fraction multiplication: Advanced
 - ◇ Operations with absolute value: Problem type 2
 - ◇ Exponents and integers: Problem type 2
 - ◇ Order of operations with integers and exponents
 - ◇ Converting between temperatures in Fahrenheit and Celsius
 - ◇ Properties of addition
 - ◇ Properties of real numbers
 - ◇ Identifying properties used to simplify an algebraic expression
 - ◇ Understanding the product rule of exponents
 - ◇ Product rule with positive exponents: Multivariate
 - ◇ Understanding the power rules of exponents
 - ◇ Power and product rules with positive exponents
 - ◇ Quotient of expressions involving exponents
 - ◇ Simplifying a ratio of multivariate monomials: Advanced
 - ◇ Power and quotient rules with positive exponents
 - ◇ Evaluating expressions with exponents of zero
 - ◇ Evaluating an expression with a negative exponent: Whole number base
 - ◇ Evaluating an expression with a negative exponent: Positive fraction base

- ◇ Evaluating an expression with a negative exponent: Negative integer base
- ◇ Rewriting an algebraic expression without a negative exponent
- ◇ Introduction to the product rule with negative exponents
- ◇ Product rule with negative exponents
- ◇ Quotient rule with negative exponents: Problem type 1
- ◇ Quotient rule with negative exponents: Problem type 2
- ◇ Power of a power rule with negative exponents
- ◇ Power rules with negative exponents
- ◇ Power and quotient rules with negative exponents: Problem type 1
- ◇ Power and quotient rules with negative exponents: Problem type 2
- ◇ Power, product, and quotient rules with negative exponents
- ◇ Scientific notation with a positive exponent
- ◇ 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
- ◇ 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 multivariate polynomial by a monomial
- ◇ Multiplying binomials in two variables
- ◇ Multiplying conjugate binomials: Multivariate
- ◇ Squaring a binomial: Multivariate
- ◇ Multiplication involving binomials and trinomials in one variable
- ◇ Multiplication involving binomials and trinomials in two variables
- ◇ Prime numbers
- ◇ Prime factorization
- ◇ 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 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

- ◇ Factoring out binomials from a polynomial: GCF factoring, advanced
- ◇ Using substitution to factor polynomials
- ◇ Simplifying a ratio of factored polynomials: Factors with exponents
- ◇ Simplifying a ratio of linear polynomials: 1, -1, and no simplification
- ◇ Simplifying a ratio of polynomials: Problem type 2
- ◇ Simplifying a ratio of polynomials: Problem type 3
- ◇ Simplifying a ratio of multivariate polynomials
- ◇ Multiplying rational expressions involving multivariate monomials
- ◇ Multiplying rational expressions involving quadratics with leading coefficients greater than 1
- ◇ Multiplying rational expressions involving multivariate quadratics
- ◇ Dividing rational expressions involving multivariate monomials
- ◇ Dividing rational expressions involving quadratics with leading coefficients greater than 1
- ◇ Dividing rational expressions involving multivariate quadratics
- ◇ Multiplication and division of 3 rational expressions
- ◇ Least common multiple of two monomials
- ◇ Finding the LCD of rational expressions with linear denominators: Common factors
- ◇ Finding the LCD of rational expressions with quadratic denominators
- ◇ Writing equivalent rational expressions with monomial denominators
- ◇ Writing equivalent rational expressions involving opposite factors
- ◇ Adding rational expressions with denominators ax^n and bx^m
- ◇ Adding rational expressions with multivariate monomial denominators: Basic
- ◇ Adding rational expressions with multivariate monomial denominators: Advanced
- ◇ Adding rational expressions with linear denominators without common factors: Advanced
- ◇ Adding rational expressions with linear denominators with common factors: Basic
- ◇ Adding rational expressions with linear denominators with common factors: Advanced
- ◇ Adding rational expressions with denominators $ax-b$ and $b-ax$
- ◇ Adding rational expressions involving different quadratic denominators
- ◇ Adding 3 rational expressions with different quadratic denominators
- ◇ Complex fraction involving multivariate monomials
- ◇ Complex fraction: Quadratic factoring
- ◇ Complex fraction made of sums involving rational expressions: Problem type 2
- ◇ Complex fraction made of sums involving rational expressions: Problem type 3
- ◇ Complex fraction made of sums involving rational expressions: Problem type 4
- ◇ Complex fraction made of sums involving rational expressions: Problem type 5
- ◇ Complex fraction made of sums involving rational expressions: Problem type 6
- ◇ Square roots of integers raised to even exponents
- ◇ Introduction to simplifying a radical expression with an even exponent
- ◇ Square root of a perfect square monomial
- ◇ Using absolute value to simplify square roots of perfect square monomials
- ◇ Finding the n^{th} root of a perfect n^{th} power fraction
- ◇ Finding the n^{th} root of a perfect n^{th} power monomial
- ◇ Using absolute value to simplify higher radical expressions
- ◇ Converting between radical form and exponent form
- ◇ Rational exponents: Unit fraction exponents and bases involving signs
- ◇ Rational exponents: Negative exponents and fractional bases
- ◇ Rational exponents: Product rule
- ◇ Rational exponents: Quotient rule
- ◇ Rational exponents: Products and quotients with negative exponents
- ◇ Rational exponents: Power of a power rule
- ◇ Rational exponents: Powers of powers with negative exponents
- ◇ Simplifying the square root of a whole number greater than 100
- ◇ Simplifying a radical expression with an even exponent
- ◇ Introduction to simplifying a radical expression with an odd exponent

- ◇ Simplifying a radical expression with an odd exponent
- ◇ Simplifying a radical expression with two variables
- ◇ Introduction to simplifying a higher radical expression
- ◇ Simplifying a higher radical expression: Univariate
- ◇ Simplifying a higher radical expression: Multivariate
- ◇ 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
- ◇ Simplifying a product of radical expressions: Multivariate, fractional expressions
- ◇ Introduction to simplifying a product of higher roots
- ◇ Simplifying a product of higher radical expressions
- ◇ Special products of radical expressions: Conjugates and squaring
- ◇ Classifying sums and products as rational or irrational
- ◇ Rationalizing a denominator: Quotient involving a monomial
- ◇ 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
- ◇ Area of a piecewise rectangular figure
- ◇ Word problem involving the area between two rectangles
- ◇ Area of a parallelogram
- ◇ Area of a trapezoid
- ◇ Perimeter involving rectangles and circles
- ◇ Circumference and area of a circle: Exact answers in terms of π
- ◇ Area involving rectangles and circles
- ◇ Word problem involving the area between two concentric circles
- ◇ Area involving inscribed figures
- ◇ Volume of a rectangular prism
- ◇ Volume of a triangular prism
- ◇ Volume of a pyramid
- ◇ Volume of a cylinder
- ◇ Word problem involving the rate of filling or emptying a cylinder
- ◇ Volume of a cone
- ◇ Volume of a cone: Exact answers in terms of π
- ◇ Volume of a sphere
- ◇ Surface area of a cube or a rectangular prism
- ◇ Surface area of a triangular prism
- ◇ Surface area of a cylinder
- ◇ Surface area of a cylinder: Exact answers in terms of π
- ◇ Surface area of a sphere
- ◇ Word problem involving the Pythagorean Theorem
- ◆ Equations and Inequalities (100 topics)
 - ◇ Identifying properties used to solve a linear equation
 - ◇ Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators

- ◇ 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 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
- ◇ Writing a multi-step equation for a real-world situation
- ◇ Solving a value mixture problem using a linear equation
- ◇ Solving a distance, rate, time problem using a linear equation
- ◇ Finding the perimeter or area of a rectangle given one of these values
- ◇ Circumference ratios
- ◇ Finding angle measures of a triangle given angles with variables
- ◇ Finding the multiplier to give a final amount after a percentage increase or decrease
- ◇ Finding the sale price given the original price and percent discount
- ◇ Finding the total cost including tax or markup
- ◇ Finding the original price given the sale price and percent discount
- ◇ Computing a percent mixture
- ◇ Solving a percent mixture problem using a linear equation
- ◇ Finding simple interest without a calculator
- ◇ 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 $|ax+b| = |cx+d|$
- ◇ Translating a sentence into a one-step inequality
- ◇ Translating a sentence into a multi-step inequality
- ◇ Writing an inequality for a real-world situation
- ◇ Writing an inequality given a graph on the number line
- ◇ Translating a sentence into a compound inequality
- ◇ Writing a compound inequality given a graph on the number line
- ◇ Writing sets of integers using set-builder and roster forms
- ◇ Union and intersection of finite sets
- ◇ Union and intersection of intervals
- ◇ Identifying solutions to a two-step linear inequality in one variable
- ◇ Additive property of inequality with signed fractions
- ◇ Multiplicative property of inequality with signed fractions
- ◇ Solving a two-step linear inequality with a fractional coefficient
- ◇ Solving a linear inequality with multiple occurrences of the variable: Problem type 1
- ◇ 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
- ◇ Solving a compound linear inequality: Graph solution, basic
- ◇ Solving a compound linear inequality: Interval notation
- ◇ 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
- ◇ 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
- ◊ Solving a proportion of the form $a/(x+b) = c/x$
- ◊ Solving a rational equation that simplifies to linear: Denominators a , x , or ax
- ◊ Solving a rational equation that simplifies to linear: Denominators ax and bx
- ◊ Solving a rational equation that simplifies to linear: Like binomial denominators
- ◊ Solving a rational equation that simplifies to linear: Unlike binomial denominators
- ◊ Solving for a variable in terms of other variables in a rational equation: Problem type 3
- ◊ Word problem on proportions: Problem type 2
- ◊ Similar polygons
- ◊ Similar right triangles
- ◊ Indirect measurement
- ◊ Word problem involving multiple rates
- ◊ Solving a work problem using a rational equation
- ◊ Solving a distance, rate, time problem using a rational equation
- ◊ Simplifying a power of i
- ◊ Solving a quadratic equation needing simplification
- ◊ Roots of a product of polynomials
- ◊ Writing a quadratic equation given the roots and the leading coefficient
- ◊ Solving a word problem using a quadratic equation with rational roots
- ◊ Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
- ◊ Solving a quadratic equation by completing the square: Exact answers
- ◊ Solving a quadratic equation with complex roots
- ◊ Discriminant of a quadratic equation
- ◊ Discriminant of a quadratic equation with a parameter
- ◊ Solving a quadratic inequality written in factored form
- ◊ Solving a quadratic inequality
- ◊ Solving a rational equation that simplifies to linear: Factorable quadratic denominator
- ◊ Solving a rational equation that simplifies to quadratic: Proportional form, basic
- ◊ Solving a rational equation that simplifies to quadratic: Denominator x
- ◊ Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
- ◊ Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
- ◊ Solving a rational equation that simplifies to quadratic: Factorable quadratic denominator
- ◊ Solving a rational equation that simplifies to quadratic: Proportional form, advanced
- ◊ 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
- ◊ Word problem involving radical equations: Basic
- ◊ Word problem involving radical equations: Advanced
- ◊ Solving an equation with exponent $1/a$: Problem type 1
- ◊ Solving an equation with exponent $1/a$: Problem type 2
- ◊ Solving an equation with a positive rational exponent
- ◊ Solving an equation with a negative rational exponent
- ◊ Solving an equation that can be written in quadratic form: Problem type 1
- ◊ Solving an equation that can be written in quadratic form: Problem type 2
- ◆ Graphs and Functions (112 topics)
 - ◊ Finding the area of a triangle or parallelogram in the coordinate plane
 - ◊ Distance between two points in the plane: Decimal answers
 - ◊ Identifying scalene, isosceles, and equilateral triangles given coordinates of their vertices
 - ◊ Midpoint of a line segment in the plane
 - ◊ Finding an endpoint of a line segment given the other endpoint and the midpoint

- ◇ Finding x- and y-intercepts of a line given the equation: Advanced
- ◇ Graphing a line given its x- and y-intercepts
- ◇ Finding x- and y-intercepts of the graph of a nonlinear equation
- ◇ Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin
- ◇ Testing an equation for symmetry about the axes and origin
- ◇ Classifying slopes given graphs of 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
- ◇ 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
- ◇ Comparing linear functions to the parent function $y = x$
- ◇ Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- ◇ Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
- ◇ Identifying parallel and perpendicular lines from equations
- ◇ Writing equations of lines parallel and perpendicular to a given line through a point
- ◇ Identifying parallel and perpendicular lines from coordinates
- ◇ Identifying coordinates that give right triangles
- ◇ Graphing ordered pairs and writing an equation from a table of values in context
- ◇ Finding the initial amount and rate of change given a table for a linear function
- ◇ Combining functions to write a new function that models a real-world situation
- ◇ Comparing properties of linear functions given in different forms
- ◇ Interpreting the parameters of a linear function that models a real-world situation
- ◇ 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
- ◇ Identifying solutions to a system of linear equations
- ◇ 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 addition
- ◇ Solving a system of linear equations using elimination with multiplication and addition
- ◇ Solving a word problem involving a sum and another basic relationship using a system of linear equations
- ◇ Identifying the center and radius to graph a circle given its equation in general form: Advanced
- ◇ Writing the equation of a circle centered at the origin given its radius or a point on the circle
- ◇ Writing an equation of a circle and identifying points that lie on the circle
- ◇ Writing an equation of a circle given its center and radius or diameter
- ◇ Deriving the equation of a circle using the Pythagorean Theorem
- ◇ Writing an equation of a circle given its center and a point on the circle
- ◇ Writing an equation of a circle given the endpoints of a diameter
- ◇ Evaluating a cube root function
- ◇ Evaluating functions: Absolute value, rational, radical
- ◇ Table for an exponential function
- ◇ Evaluating a piecewise-defined function
- ◇ Domains of higher root functions

- ◇ Finding the domain of a fractional function involving radicals
- ◇ Determining whether an equation defines a function: Basic
- ◇ Determining whether an equation defines a function: Advanced
- ◇ Domain and range of a linear function that models a real-world situation
- ◇ Rewriting a multivariate function as a univariate function given a relationship between its variables
- ◇ Finding a difference quotient for a linear or quadratic function
- ◇ Finding a difference quotient for a rational function
- ◇ Domain and range from the graph of a discrete relation
- ◇ Finding domain and range from a linear graph in context
- ◇ Domain and range from the graph of a piecewise function
- ◇ Choosing a graph to fit a narrative: Basic
- ◇ Choosing a graph to fit a narrative: Advanced
- ◇ Graphing an integer function and finding its range for a given domain
- ◇ Graphing a square root function: Problem type 3
- ◇ Graphing a cube root function
- ◇ Graphing an exponential function and its asymptote: $f(x)=b^x$
- ◇ 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
- ◇ Even and odd functions: Problem type 1
- ◇ Even and odd functions: Problem type 2
- ◇ Finding the average rate of change of a function
- ◇ Finding the average rate of change of a function given its graph
- ◇ Word problem involving average rate of change
- ◇ Writing the equation of a secant line
- ◇ How the leading coefficient affects the shape of a parabola
- ◇ How the leading coefficient affects the graph of an absolute value function
- ◇ Sum, difference, and product of two functions
- ◇ Quotient of two functions: Basic
- ◇ Quotient of two functions: Advanced
- ◇ Combining functions: Advanced
- ◇ Composition of a function with itself
- ◇ Expressing a function as a composition of two functions
- ◇ Composition of two functions: Domain and range
- ◇ Composition of two functions: Advanced
- ◇ Composition of two rational functions
- ◇ Word problem involving composition of two functions
- ◇ Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- ◇ Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients
- ◇ Finding the zeros of a quadratic function given its equation
- ◇ Using a graphing calculator to find the zeros of a quadratic function
- ◇ 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
- ◇ Word problem involving optimizing area by using a quadratic function
- ◇ Domain and range from the graph of a quadratic function
- ◇ Range of a quadratic function
- ◇ Writing the equation of a quadratic function given its graph
- ◇ Finding zeros of a polynomial function written in factored form
- ◇ Finding x- and y-intercepts given a polynomial function

- ◊ Using a graphing calculator to find local extrema of a polynomial function
- ◊ Using a graphing calculator to find zeros of a polynomial function
- ◆ Trigonometric Functions (27 topics)
 - ◊ Sketching an approximation of an angle given in radians
 - ◊ Sketching an angle in standard position given in degrees and finding a coterminal angle
 - ◊ Sketching an angle in standard position given in radians and finding a coterminal angle
 - ◊ Sketching an angle with absolute value greater than 360 degrees in standard position
 - ◊ Sketching an angle with absolute value greater than 2 radians in standard position
 - ◊ Sketching an angle with absolute value greater than 360 degrees and finding coterminal angles
 - ◊ Sketching an angle with absolute value greater than 2 radians and finding coterminal angles
 - ◊ Drawing an arc to find a central angle or an arc length on the unit circle
 - ◊ Drawing an arc to find a central angle or an arc length on a non-unit circle
 - ◊ Relating two angle measures in a real-world situation that involves interlocking gears
 - ◊ Using the coordinates of points on the unit circle to define sine and cosine for all real numbers
 - ◊ Drawing a reference triangle on the unit circle and using it to derive values of trigonometric functions: Degrees
 - ◊ Using symmetries on the unit circle to understand trigonometric identities: Problem type 1
 - ◊ Using the unit circle to understand that sine and cosine are periodic
 - ◊ Using the coordinates of points on the unit circle to define trigonometric functions for all real numbers
 - ◊ Using symmetries on the unit circle to understand trigonometric identities: Problem type 2
 - ◊ Using the unit circle to understand the odd and even identities for sine and cosine
 - ◊ Simplifying a trigonometric expression: Rationalizing the denominator using conjugates
 - ◊ Using a calculator to approximate cosecant, secant, and cotangent values
 - ◊ Sine, cosine, and tangent ratios: Numbers for side lengths
 - ◊ Understanding trigonometric ratios through similar right triangles
 - ◊ Relationship between the sines and cosines of complementary angles
 - ◊ Using similar right triangles to find trigonometric ratios
 - ◊ Word problem involving a triangle whose side lengths change with time: Problem type 1
 - ◊ Word problem involving a triangle whose side lengths change with time: Problem type 2
 - ◊ Using trigonometry to find lengths in a figure involving two right triangles
 - ◊ Sketching an angle with absolute value greater than 360 degrees, and also its reference angle
- ◆ Trigonometric Graphs (5 topics)
 - ◊ Using graphing to solve a trigonometric equation involving sine or cosine
 - ◊ Average rate of change involving a sinusoidal function
 - ◊ Understanding how changes to the amplitude, period, phase shift, and vertical shift affect a sinusoidal graph
 - ◊ Sketching the graph of a sinusoidal function that models a real-world situation and using the graph to approximate solutions to an equation
 - ◊ Sketching a graph of a damped sine or cosine function
- ◆ Trigonometric Identities and Equations (12 topics)
 - ◊ Proving an identity using fundamental trigonometric identities: Problem type 8
 - ◊ Using a double-angle identity to find the exact value of a composition of trigonometric functions
 - ◊ Double-angle identities: Problem type 3
 - ◊ Proving trigonometric identities using sum-to-product identities: Problem type 1
 - ◊ Proving trigonometric identities using sum-to-product identities: Problem type 2
 - ◊ Using a Pythagorean identity to find solutions in an interval for a trigonometric equation involving sine and cosine: Problem type 2
 - ◊ Using a Pythagorean identity to find solutions in an interval for a trigonometric equation: Problem type 2
 - ◊ Using a graphing calculator to solve a trigonometric inequality
 - ◊ Solving a trigonometric equation involving more than one function
 - ◊ Solving a trigonometric equation using sum and difference identities

- ◊ Solving a trigonometric equation using double-angle identities
- ◊ Solving a trigonometric equation using half-angle identities
- ◆ Triangles and Vectors (7 topics)
 - ◊ Proving the law of sines
 - ◊ Proving the law of cosines
 - ◊ Expressing the area of a triangle in terms of the sine of one of its angles
 - ◊ Finding magnitudes of forces related to a sum of three vectors
 - ◊ Finding magnitudes of forces related to an object suspended by cables
 - ◊ Using the dot product to find perpendicular vectors
 - ◊ Finding the component of a vector along another vector
- ◆ Polar Coordinates and Complex Numbers (2 topics)
 - ◊ Converting rectangular coordinates to polar coordinates: Decimal answers
 - ◊ Identifying symmetries of graphs given their polar equations
- ◆ Conic Sections (24 topics)
 - ◊ 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
 - ◊ Deriving the equation of a parabola given its focus and 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
 - ◊ 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
- ◆ Exponential and Logarithmic Functions (62 topics)
 - ◊ 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
 - ◊ Graphing an exponential function and finding its domain and range
 - ◊ Transforming the graph of a natural exponential function and finding its domain and range
 - ◊ Graphing an exponential function and its asymptote: $f(x) = a(e)^{x-b} + c$
 - ◊ Using a calculator to evaluate exponential expressions
 - ◊ Evaluating an exponential function that models a real-world situation
 - ◊ Using a calculator to evaluate exponential expressions involving base e
 - ◊ Evaluating an exponential function with base e that models a real-world situation
 - ◊ Introduction to compound interest
 - ◊ Calculating and comparing simple interest and compound interest

- ◇ Finding a final amount in a word problem on exponential growth or decay
- ◇ Finding the final amount in a word problem on compound interest
- ◇ 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
- ◇ Using a calculator to evaluate natural and common logarithmic expressions
- ◇ Converting between logarithmic and exponential equations
- ◇ Converting between natural logarithmic and exponential equations
- ◇ Evaluating logarithmic expressions
- ◇ Solving an equation of the form $\log_b a = c$
- ◇ Translating the graph of a logarithmic function
- ◇ Graphing a logarithmic function: Basic
- ◇ Graphing a logarithmic function and finding its domain and range
- ◇ Domain of a logarithmic function: Advanced
- ◇ Graphing a logarithmic function: Advanced
- ◇ Basic properties of logarithms
- ◇ Using properties of logarithms to evaluate expressions
- ◇ Expanding a logarithmic expression: Problem type 1
- ◇ Expanding a logarithmic expression: Problem type 2
- ◇ Expanding a logarithmic expression: Problem type 3
- ◇ Writing an expression as a single logarithm
- ◇ Change of base for logarithms: Problem type 1
- ◇ Change of base for logarithms: Problem type 2
- ◇ Solving a multi-step equation involving a single logarithm: Problem type 1
- ◇ Solving a multi-step equation involving a single logarithm: Problem type 2
- ◇ Solving a multi-step equation involving natural logarithms
- ◇ Solving an equation involving logarithms on both sides: Problem type 1
- ◇ Solving an equation involving logarithms on both sides: Problem type 2
- ◇ Solving an exponential equation by finding common bases: Linear exponents
- ◇ Solving an exponential equation by finding common bases: Linear and quadratic exponents
- ◇ Solving an exponential equation by using logarithms: Decimal answers, basic
- ◇ Solving an exponential equation by using natural logarithms: Decimal answers
- ◇ Solving an exponential equation by using logarithms: Decimal answers, advanced
- ◇ Solving an exponential equation by using logarithms: Exact answers in logarithmic form
- ◇ Solving an exponential equation by using substitution and quadratic factoring
- ◇ Using a graphing calculator to solve an exponential or logarithmic equation
- ◇ Finding solutions in an interval for an equation involving a trigonometric expression and either exponentials or logarithms
- ◇ Finding the time to reach a limit in a word problem on exponential growth or decay
- ◇ Finding the time in a word problem on compound interest
- ◇ Finding the time given an exponential function with base e that models a real-world situation
- ◇ Finding the final amount in a word problem on continuous compound interest
- ◇ Finding the final amount in a word problem on continuous exponential growth or decay
- ◇ Finding the initial amount in a word problem on continuous compound interest
- ◇ Finding the rate or time in a word problem on continuous exponential growth or decay
- ◇ Finding half-life or doubling time
- ◇ Writing and evaluating a function modeling continuous exponential growth or decay given doubling time or half-life
- ◇ Writing and evaluating a function modeling continuous exponential growth or decay given two outputs
- ◇ Proving identities involving trigonometric functions and logarithmic functions

***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.*