ALEKS®

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 nth root of a perfect n^{th} power fraction
◊ Finding the nth 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 pi
◊ 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 pi
◊ 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 pi
◊ 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.*