ALEKS®

Trigonometry

This course covers the topics outlined below, **new topics** have been highlighted. You can customize the scope and sequence of this course to meet your curricular needs.

Curriculum (426 topics + 501 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 made up of 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
◊ Algebraic symbol manipulation with 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 the line
◊ Finding the slope 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 an equation of a line given the y–intercept and another point
◊ Writing the equation of the 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 initial amount 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 (36 topics)
♦ Angles and Their Measure (9 topics)
◊ Converting degrees−minutes−seconds to decimal degrees
◊ Converting a decimal degree to degrees−minutes−seconds
◊ Converting between degree and radian measure: Problem type 1
◊ Converting between degree and radian measure: Problem type 2
◊ Sketching an angle in standard position
◊ Coterminal angles
◊ Arc length and central angle measure
◊ Area of a sector of a circle
◊ Angular and linear speed
♦ The Unit Circle and Evaluating Trigonometric Functions (10 topics)
◊ Finding coordinates on the unit circle for special angles
◊ Finding a point on the unit circle given one coordinate
◊ Trigonometric functions and special angles: Problem type 1
◊ Finding trigonometric ratios 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 and cosine
◊ Even and odd properties of 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 (10 topics)
◊ Special right triangles: Exact answers
◊ Sine, cosine, and tangent ratios: Variables for side lengths
◊ Using the Pythagorean Theorem to find a trigonometric ratio
◊ Finding trigonometric ratios given 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 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 (7 topics)
◊ Reference angles: Problem type 1
◊ Reference angles: Problem type 2
◊ Determining the location of a terminal point given the signs of trigonometric values
◊ Finding values of trigonometric functions given information about an angle: Problem type 1
◊ Finding values of trigonometric functions given information about an angle: Problem type 2
◊ Finding values of trigonometric functions given information about an angle: Problem type 3
◊ Finding values of trigonometric functions given information about an angle: Problem type 4
• Trigonometric Graphs (20 topics)
♦ Graphs of Sine and Cosine Functions (14 topics)
◊ Sketching the graph of y= a sin(x) or y= a cos(x)
◊ Sketching the graph of y= sin(bx) or y= cos(bx)
◊ Sketching the graph of y= sin(x)+ d or y= cos(x)+ d
◊ Sketching the graph of y= sin(x+c) or y= cos(x+c)
◊ Sketching the graph of y= a sin(x+c) or y= a cos(x+c)
◊ Sketching the graph of y= a sin(bx) or y= a cos(bx)
◊ Sketching the graph of y= a sin(bx+c) or y= a cos(bx+c)
◊ Sketching the graph of y= a sin(bx)+ d or y= a cos(bx)+ d
◊ Amplitude and period of sine and cosine functions
◊ Amplitude, period, and phase shift of sine and cosine functions
◊ 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
◊ 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 1
◊ Sketching the graph of a tangent or cotangent function: Problem type 2
• Trigonometric Identities and Equations (47 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 (7 topics)
◊ Simplifying trigonometric expressions
◊ Using cofunction identities
◊ Verifying a trigonometric identity
◊ Proving trigonometric identities: Problem type 1
◊ Proving trigonometric identities: Problem type 2
◊ Proving trigonometric identities: Problem type 3
◊ Proving trigonometric identities using odd and even properties
♦ Sum and Difference Formulas (6 topics)
◊ Sum and difference identities: Problem type 1
◊ Sum and difference identities: Problem type 2
◊ Sum and difference identities: Problem type 3
◊ Sum and difference identities: Problem type 4
◊ Proving trigonometric identities using sum and difference properties: Problem type 1
◊ Proving trigonometric identities using sum and difference properties: Problem type 2
♦ Double−Angle, Half−Angle, and Product−to−Sum Formulas (8 topics)
◊ Double−angle identities: Problem type 1
◊ Double−angle identities: Problem type 2
◊ Power−reducing identities
◊ Half−angle identities: Problem type 1
◊ Half−angle identities: Problem type 2
◊ Product−to−sum and sum−to−product identities: Problem type 1
◊ Product−to−sum and sum−to−product identities: Problem type 2
◊ Proving trigonometric identities using double−angle properties
♦ Trigonometric Equations (17 topics)
◊ Finding solutions in an interval for a basic equation involving sine or cosine
◊ Finding solutions in an interval for a basic tangent, cotangent, secant, or cosecant equation
◊ Solving a basic trigonometric equation using a calculator
◊ Solving a basic trigonometric equation involving sine or cosine
◊ Solving a basic trigonometric equation involving tangent, cotangent, secant, or cosecant
◊ Finding solutions in an interval for a trigonometric equation in factored form
◊ Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 1
◊ Finding solutions in an interval for a trigonometric equation with a squared function: Problem type 2
◊ Finding solutions in an interval for a trigonometric equation using Pythagorean identities: Problem type 1
◊ Finding solutions in an interval for an equation with sine and 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 with an angle multiplied by a constant
◊ Finding solutions in an interval for an equation with sine and cosine using sum and difference identities

- Triangles and Vectors (34 topics)
    - Laws of Sines and Cosines (8 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
        - ◊ Using trigonometry to find the area of a right triangle
        - ◊ Finding the area of a triangle using trigonometry
        - ◊ 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(*) (501 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 positive exponent
◊ Scientific notation with 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
◊ Set builder notation
◊ 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 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 positive rational exponent
◊ Solving an equation with 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 (111 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 an equation in point−slope form given the slope and a point
  ◊ Writing an equation 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: $f(x)=b^x$
◊ Graphing a piecewise−defined function: Problem type 1
◊ 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, x−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 (5 topics)
  - ◊ 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
- ♦ Trigonometric Graphs (1 topics)
  - ◊ Sketching a graph of a damped sine or cosine function
- ♦ Trigonometric Identities and Equations (9 topics)
  - ◊ Proving trigonometric identities: Problem type 4
  - ◊ Double–angle identities: Problem type 3
  - ◊ Proving trigonometric identities using sum–to–product formulas
  - ◊ Finding solutions in an interval for a trigonometric equation using Pythagorean identities: 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 (60 topics)
◊ Graphing an exponential function: $f(x) = a(b)^x$
◊ Graphing an exponential function: $f(x)=b^{-x}$ or $f(x)=-b^{ax}$
◊ Translating the graph of an exponential function
◊ Finding domain and range from the graph of an exponential function
◊ The graph, domain, and range of an exponential function
◊ Transforming the graph of a natural exponential function
◊ 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
◊ The graph, domain, and range of a logarithmic function
◊ 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 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

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.*