ALEKS®

College Algebra with 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 (597 topics + 646 additional topics)

- Algebra and Geometry Review (126 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 (20 topics)
    - ◊ Introduction to the product rule of exponents
    - ◊ Product rule with positive exponents: Univariate
    - ◊ Product rule with positive exponents: Multivariate
    - ◊ Introduction to the power of a power rule of exponents
    - ◊ Introduction to the power of a product rule of exponents
    - ◊ Power rules with positive exponents: Multivariate products
    - ◊ Power rules with positive exponents: Multivariate quotients
    - ◊ Simplifying a ratio of multivariate monomials: Basic
    - ◊ Introduction to the quotient rule of exponents
    - ◊ Simplifying a ratio of univariate monomials
    - ◊ Quotient of expressions involving exponents
    - ◊ 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
    - ◊ Quotient rule with negative exponents: Problem type 1
    - ◊ Power of a power rule with negative exponents
    - ◊ Power rules with negative exponents
  - ♦ Polynomial Expressions (14 topics)
    - ◊ Degree and leading coefficient of a univariate polynomial
    - ◊ 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 a multivariate polynomial by a monomial
- ◊ Multiplying binomials with leading coefficients of 1
- ◊ Multiplying binomials with leading coefficients greater than 1
- ◊ Multiplying binomials in two variables
- ◊ Multiplying conjugate binomials: Univariate
- ◊ Squaring a binomial: Univariate
- ◊ Squaring a binomial: Multivariate
- ◊ Multiplying binomials with negative coefficients
- ◊ Multiplication involving binomials and trinomials in one variable
- ◊ Multiplication involving binomials and trinomials in two variables

♦ Factoring Polynomials (16 topics)

- ◊ Greatest common factor of 2 numbers
- ◊ Factoring a linear binomial
- ◊ Introduction to the GCF of two monomials
- ◊ Greatest common factor of two multivariate monomials
- ◊ Factoring out a monomial from a polynomial: Univariate
- ◊ 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 quadratic with leading coefficient 1
- ◊ Factoring out a constant before factoring a quadratic
- ◊ Factoring a quadratic with leading coefficient greater than 1: Problem type 1
- ◊ Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- ◊ Factoring a quadratic with a negative leading coefficient
- ◊ Factoring 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 (7 topics)

- ◊ Square root of a rational perfect square
- ◊ Square roots of perfect squares with signs
- ◊ Introduction to simplifying a radical expression with an even exponent
- ◊ Square root of a perfect square monomial
- ◊ 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 (4 topics)

- ◊ Converting between radical form and exponent form
- ◊ Rational exponents: Unit fraction exponents and whole number bases
- ◊ Rational exponents: Non−unit fraction exponent with a whole number base
- ◊ Rational exponents: Negative exponents and fractional bases

♦ Radical Expressions (19 topics)

- ◊ Simplifying the square root of a whole number less 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 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 of radical expressions: Univariate
- ◊ 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 (4 topics)

- ◊ Circumference of a circle
- ◊ Volume of a rectangular prism
- ◊ Introduction to the Pythagorean Theorem
- ◊ Pythagorean Theorem

• Equations and Inequalities (83 topics)

♦ Linear Equations and Applications (27 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 linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- ◊ Solving a two−step equation with signed fractions
- ◊ Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- ◊ Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- ◊ Solving 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
- ◊ Translating a sentence into a multi−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 word problem with three unknowns using a linear equation
- ◊ Solving a one−step word problem using the formula d = rt
- ◊ Solving a distance, rate, time problem using a linear equation
- ◊ Finding the perimeter or area of a rectangle given one of these values
- ◊ Finding the sale price given the original price and percent discount

♦ Absolute Value Equations (2 topics)
- ◊ Solving an absolute value equation: Problem type 1
- ◊ Solving an absolute value equation: Problem type 2

♦ Linear Inequalities and Applications (7 topics)
- ◊ Graphing a linear inequality on the number line
- ◊ Graphing a compound inequality on the number line
- ◊ Set−builder and interval notation
- ◊ Identifying solutions to a two−step linear inequality in one variable
- ◊ Solving a two−step linear inequality: Problem type 1
- ◊ Solving a two−step linear inequality: Problem type 2
- ◊ Solving a linear inequality with multiple occurrences of the variable: Problem type 1

♦ Rational Equations that Simplify to Linear (8 topics)
- ◊ Solving a rational equation that simplifies to linear: Denominator x
- ◊ Solving a rational equation that simplifies to linear: Denominator x+a
- ◊ Solving a rational equation that simplifies to linear: Denominators a, x, or ax
- ◊ Solving a rational equation that simplifies to linear: Denominators ax and bx
- ◊ Solving a rational equation that simplifies to linear: Like binomial denominators
- ◊ Solving a rational equation that simplifies to linear: Unlike binomial denominators
- ◊ Solving 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

♦ Complex Numbers (4 topics)
- ◊ Using i to rewrite square roots of negative numbers
- ◊ Adding or subtracting complex numbers
- ◊ Multiplying complex numbers
- ◊ Dividing complex numbers

♦ Quadratic Equations (20 topics)
- ◊ Solving an equation written in factored form

◊ Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$
◊ Finding the roots of a quadratic equation with leading coefficient 1
◊ Finding the roots of a quadratic equation with leading coefficient greater than 1
◊ Solving a quadratic equation needing simplification
◊ 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
◊ 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
◊ Solving a quadratic equation by completing the square: Exact answers
◊ Applying the quadratic formula: Exact answers
◊ Applying the quadratic formula: Decimal answers
◊ Solving a quadratic equation with complex roots
◊ Discriminant of a quadratic equation
◊ Solving a word problem using a quadratic equation with irrational roots
◊ 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 (5 topics)
◊ Restriction on a variable in a denominator: Quadratic
◊ Solving a rational equation that simplifies to linear: Factorable quadratic denominator
◊ Solving a rational equation that simplifies to quadratic: Denominator x
◊ Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
◊ Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators

♦ Radical Equations (10 topics)
◊ Introduction to solving a radical equation
◊ Solving a radical equation that simplifies to a linear equation: One radical, basic
◊ Solving a radical equation that simplifies to a linear equation: One radical, advanced
◊ Solving a radical equation that simplifies to a linear equation: Two radicals
◊ Solving a radical equation that simplifies to a quadratic equation: One radical, basic
◊ Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
◊ Solving for a variable in terms of other variables in an equation involving radicals
◊ Solving an equation with a root index greater than 2: Problem type 1
◊ Solving an equation with a root index greater than 2: Problem type 2
◊ Solving an equation that can be written in quadratic form: Problem type 1

• Graphs and Functions (139 topics)

♦ The Coordinate Plane, Distance, and Midpoint (9 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
◊ Midpoint of a line segment in the plane
◊ Identifying solutions to a linear equation in two variables
◊ Finding a solution to a linear equation in two variables

♦ Graphs of Equations (16 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
- ◊ Finding x− and y−intercepts of a line given the equation: Advanced
- ◊ Graphing a line by first finding its x− and y−intercepts
- ◊ Finding intercepts of a nonlinear function given its graph
- ◊ Finding x− and y−intercepts of the graph of a nonlinear equation
- ◊ 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 $y = ax^3$
- ◊ Determining if graphs have symmetry with respect to the x−axis, y−axis, or origin

♦ Slope and Equations of Lines (17 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
- ◊ Graphing a line given its slope and y−intercept
- ◊ 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 $Ax + By = C$
- ◊ Graphing a line by first finding its slope and y−intercept
- ◊ 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
- ◊ Finding the slope and a point on 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 given the y−intercept and another point
- ◊ Writing the equation of a line through two given points
- ◊ Writing the equations of vertical and horizontal lines through a given point
- ◊ 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 $Ax + By = C$
- ◊ Writing equations of lines parallel and perpendicular to a given line through a point

♦ Linear Applications (5 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
- ◊ Interpreting the parameters of a linear function that models a real−world situation
- ◊ Application problem with a linear function: Finding a coordinate given two points

♦ Circles (6 topics)

- ◊ Identifying the center and radius to graph a circle given its equation in standard form
- ◊ Identifying the center and radius to graph a circle given its equation in general form: Basic
- ◊ Writing the equation of a circle centered at the origin given its radius or a point on the circle
- ◊ Writing an equation of a circle given its center and radius or diameter
- ◊ 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

♦ Functions (26 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
- ◊ Evaluating a cube root function
- ◊ Evaluating functions: Absolute value, rational, radical
- ◊ Evaluating a piecewise−defined 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 the domain of a fractional function involving radicals
- ◊ Determining whether an equation defines a function: Basic
- ◊ Determining whether an equation defines a 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
- ◊ Finding a difference quotient for a linear or quadratic function
- ◊ Finding a difference quotient for a rational function

♦ Graphs of Functions (28 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
- ◊ Domain and range from the graph of a piecewise 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
- ◊ 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

♦ Transformations (13 topics)

- ◊ Translating the graph of a parabola: One step
- ◊ Translating the graph of a parabola: Two steps
- ◊ How the leading coefficient affects the shape of a parabola
- ◊ 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 (19 topics)
◊ Sum, difference, and product of two functions
◊ Quotient of two functions: Basic
◊ Quotient of two functions: Advanced
◊ Combining functions: Advanced
◊ Introduction to the composition of two functions
◊ Composition of two functions: Basic
◊ Composition of a function with itself
◊ Expressing a function as a composition of two functions
◊ Composition of two functions: Advanced
◊ Composition of two rational functions
◊ Word problem involving composition of two functions
◊ 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

• Polynomial and Rational Functions (64 topics)

♦ Quadratic Functions (16 topics)
◊ Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
◊ 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 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 to find its vertex and sketch its graph
◊ Finding the maximum or minimum of a quadratic function
◊ Word problem involving the maximum or minimum of a quadratic function
◊ 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

♦ Polynomial Functions (10 topics)
◊ Finding zeros of a polynomial function written in factored form
◊ Finding zeros and their multiplicities given a polynomial function written in factored form
◊ Finding a polynomial of a given degree with given zeros: Real zeros
◊ Finding x− and y−intercepts given a polynomial function
◊ Determining the end behavior of the graph of a polynomial function
◊ Determining end behavior and intercepts to graph a polynomial function

- ◊ Matching graphs with polynomial functions
- ◊ Inferring properties of a polynomial function from its graph
- ◊ Using a graphing calculator to find local extrema of a polynomial function
- ◊ Using a graphing calculator to solve a word problem involving a local extremum of a polynomial function

♦ Division of Polynomials; Remainder and Factor Theorems (6 topics)

- ◊ Polynomial long division: Problem type 1
- ◊ Polynomial long division: Problem type 2
- ◊ Polynomial long division: Problem type 3
- ◊ Synthetic division
- ◊ Using the remainder theorem to evaluate a polynomial
- ◊ The Factor Theorem

♦ Real Zeros of Polynomial Functions (7 topics)

- ◊ Using a given zero to write a polynomial as a product of linear factors: Real zeros
- ◊ Finding all possible rational zeros using the rational zeros theorem: Problem type 1
- ◊ Finding all possible rational zeros using the rational zeros theorem: Problem type 2
- ◊ Using the rational zeros theorem to find all zeros of a polynomial: Rational zeros
- ◊ Using the rational zeros theorem to find all zeros of a polynomial: Irrational zeros
- ◊ Using a graphing calculator to find zeros of a polynomial function
- ◊ Using a graphing calculator to solve a word problem involving a polynomial of degree 3

♦ Complex Zeros of Polynomials Functions (4 topics)

- ◊ Multiplying expressions involving complex conjugates
- ◊ Finding a polynomial of a given degree with given zeros: Complex zeros
- ◊ Using a given zero to write a polynomial as a product of linear factors: Complex zeros
- ◊ Using the rational zeros theorem to find all zeros of a polynomial: Complex zeros

♦ Rational Functions (13 topics)

- ◊ Finding the intercepts, asymptotes, domain, and range from the graph of a rational function
- ◊ Finding the asymptotes of a rational function: Constant over linear
- ◊ Finding the asymptotes of a rational function: Linear over linear
- ◊ Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- ◊ Finding the asymptotes of a rational function: Quadratic over linear
- ◊ Graphing a rational function: Constant over linear
- ◊ Graphing a rational function: Linear over linear
- ◊ Transforming the graph of a rational function
- ◊ Graphing a rational function: Quadratic over linear
- ◊ Graphing rational functions with holes
- ◊ Matching graphs with rational functions: Two vertical asymptotes
- ◊ Graphing a rational function with more than one vertical asymptote
- ◊ Using a graphing calculator to solve a word problem involving a local extremum of a rational function

♦ Polynomial and Rational Inequalities (8 topics)

- ◊ Solving a quadratic inequality written in factored form
- ◊ Solving a quadratic inequality
- ◊ Solving a polynomial inequality: Problem type 1
- ◊ Solving a polynomial inequality: Problem type 2
- ◊ Solving a polynomial inequality: Problem type 3
- ◊ Solving a polynomial inequality: Problem type 4
- ◊ Solving a rational inequality: Problem type 1
- ◊ Solving a rational inequality: Problem type 2

• Exponential and Logarithmic Functions (50 topics)

♦ Graphing Exponential Functions (8 topics)

- ◊ Table for an exponential function

- ◊ Graphing an exponential function and its asymptote: $f(x)=b^x$
- ◊ Graphing an exponential function and its asymptote: $f(x) = a(b)^x$
- ◊ Graphing an exponential function and its asymptote: $f(x) = b^{-x}$ or $f(x) = -b^x$ or $f(x) = -b^{-x}$
- ◊ Translating the graph of an exponential function
- ◊ 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: $f(x) = a(e)^{x-b} + c$

♦ Applications of Exponential Functions (7 topics)

- ◊ Using a calculator to evaluate exponential expressions
- ◊ Evaluating an exponential function that models a real−world situation
- ◊ Using a calculator to evaluate exponential expressions involving base e
- ◊ Evaluating an exponential function with base e that models a real−world situation
- ◊ Introduction to 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

♦ Logarithmic Functions (9 topics)

- ◊ Using a calculator to evaluate natural and common logarithmic expressions
- ◊ Converting between logarithmic and exponential equations
- ◊ Converting between natural logarithmic and exponential equations
- ◊ Evaluating logarithmic expressions
- ◊ 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

♦ Properties of Logarithms (6 topics)

- ◊ 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
- ◊ Writing an expression as a single logarithm
- ◊ Change of base for logarithms: Problem type 1

♦ Logarithmic and Exponential Equations (10 topics)

- ◊ 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 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

♦ Applications (10 topics)

- ◊ 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 initial amount in a word problem on continuous compound interest
- ◊ Finding the final amount in a word problem on continuous exponential growth or decay
- ◊ Finding the rate or time in a word problem on continuous exponential growth or decay
- ◊ 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

• Trigonometric Functions (80 topics)

♦ Angles and Their Measure (6 topics)

- ◊ 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

♦ The Unit Circle and Evaluating Trigonometric Functions (15 topics)

- ◊ Finding coordinates on the unit circle for special angles
- ◊ Using the coordinates of points on the unit circle to define sine and cosine for all real numbers
- ◊ 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
- ◊ Using the coordinates of points on the unit circle to define trigonometric functions for all real numbers
- ◊ Trigonometric functions and special angles: Problem type 3
- ◊ Using the unit circle to understand the odd and even identities for sine and cosine
- ◊ 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 (10 topics)

- ◊ 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
- ♦ 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
- ♦ Inverse Trigonometric Functions (8 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
  - ◊ Using a calculator to approximate inverse trigonometric values

• Trigonometric Identities and Equations (49 topics)
- ♦ Verifying Trigonometric Identities (13 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

♦ 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, Product−to−Sum, and Power Reducing 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 (16 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
- ◊ 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

- Additional Topics in Trigonometry (6 topics)
  - ♦ Laws of Sines and Cosines (6 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

- Other Topics Available(*) (646 additional topics)
  - ♦ Algebra and Geometry Review (160 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
    - ◊ Ordering numbers with positive exponents
    - ◊ Understanding the power rules of exponents
    - ◊ Power and product rules with positive exponents
    - ◊ Simplifying a ratio of multivariate monomials: Advanced
    - ◊ Power and quotient rules with positive exponents
    - ◊ Ordering numbers with negative exponents
    - ◊ Product rule with negative exponents
    - ◊ Quotient rule with negative exponents: Problem type 2
    - ◊ 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 of a multivariate polynomial
    - ◊ Simplifying a sum or difference of three univariate polynomials
    - ◊ Simplifying a sum or difference of multivariate polynomials

◊ Multiplying conjugate binomials: Multivariate
◊ Prime numbers
◊ Prime factorization
◊ Greatest common factor of three univariate monomials
◊ Factoring a univariate polynomial by grouping: Problem type 2
◊ Factoring a multivariate polynomial by grouping: Problem type 1
◊ Factoring a multivariate polynomial by grouping: Problem type 2
◊ Factoring a quadratic in two variables with leading coefficient 1
◊ Factoring a quadratic with leading coefficient greater than 1: Problem type 3
◊ Factoring a quadratic by the ac−method
◊ Factoring a quadratic in two variables with leading coefficient greater than 1
◊ Factoring a perfect square trinomial with leading coefficient greater than 1
◊ Factoring a perfect square trinomial in two variables
◊ Factoring a difference of squares in two variables
◊ Factoring a polynomial involving a GCF and a difference of squares: Univariate
◊ Factoring a polynomial involving a GCF and a difference of squares: Multivariate
◊ Factoring a product of a quadratic trinomial and a monomial
◊ Factoring with repeated use of the difference of squares formula
◊ Factoring a sum or difference of two cubes
◊ 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
◊ Complex fraction made of sums involving rational expressions: Multivariate
◊ Complex fraction with negative exponents: Problem type 1
◊ Complex fraction with negative exponents: Problem type 2
◊ Complex fraction that contains a complex fraction
◊ Finding all square roots of a number
◊ Square roots of integers raised to even exponents
◊ Using absolute value to simplify square roots of perfect square monomials
◊ Finding the n^{th} root of a perfect n^{th} power fraction
◊ Finding the n^{th} root of a perfect n^{th} power monomial
◊ Using absolute value to simplify higher radical expressions
◊ Rational exponents: Unit fraction exponents and bases involving signs
◊ 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 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
◊ 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 triangle
◊ Area of a parallelogram
◊ Area of a trapezoid
◊ Perimeter involving rectangles and circles
◊ Circumference and area of a circle
◊ 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 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 (76 topics)

- ◊ Identifying properties used to solve a linear equation
- ◊ Solving equations with zero, one, or infinitely many solutions
- ◊ 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 involving consecutive integers
- ◊ Writing a multi−step equation for a real−world situation
- ◊ Solving a value mixture problem using a linear equation
- ◊ Finding a side length given the perimeter and side lengths with variables
- ◊ Circumference ratios
- ◊ Solving equations involving vertical angles
- ◊ Finding angle measures of a triangle given angles with variables
- ◊ Finding the value for a new score that will yield a given mean
- ◊ Finding the multiplier to give a final amount after a percentage increase or decrease
- ◊ 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
- ◊ Converting a repeating decimal to a fraction
- ◊ 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
- ◊ Additive property of inequality with signed fractions
- ◊ Multiplicative property of inequality with signed fractions
- ◊ Solving a two−step linear inequality with a fractional coefficient
- ◊ Solving a linear inequality with multiple occurrences of the variable: Problem type 2
- ◊ Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- ◊ Solving inequalities with no solution or all real numbers as solutions
- ◊ 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 for a variable in terms of other variables in a rational equation: Problem type 3
- ◊ Word problem on proportions: Problem type 1
- ◊ Word problem on proportions: Problem type 2
- ◊ Similar polygons
- ◊ Similar right triangles
- ◊ Indirect measurement
- ◊ Ratio of volumes
- ◊ Word problem involving multiple rates
- ◊ Solving a work problem using a rational equation
- ◊ Solving a distance, rate, time problem using a rational equation
- ◊ Ordering fractions with variables
- ◊ Simplifying a product and quotient involving square roots of negative numbers
- ◊ Simplifying a power of i
- ◊ Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
- ◊ Discriminant of a quadratic equation with a parameter
- ◊ Solving a rational equation that simplifies to quadratic: Proportional form, basic
- ◊ 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 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 2

♦ Graphs and Functions (61 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
- ◊ Finding an endpoint of a line segment given the other endpoint and the midpoint
- ◊ Graphing a line given its x− and y−intercepts
- ◊ 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 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
- ◊ 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
- ◊ Graphing a line given its equation in point−slope form

- ◊ Writing the equation of a line in standard form given the slope and a point
- ◊ Comparing linear functions to the parent function y = x
- ◊ Identifying parallel and perpendicular lines from equations
- ◊ 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
- ◊ Application problem with a linear function: Finding a coordinate given the slope and a point
- ◊ Solving a linear equation by graphing
- ◊ Constructing a scatter plot
- ◊ Sketching the line of best fit
- ◊ Scatter plots and correlation
- ◊ Predictions from the line of best fit
- ◊ Approximating the equation of a line of best fit and making predictions
- ◊ Computing residuals
- ◊ Interpreting residual plots
- ◊ Classifying linear and nonlinear relationships from scatter plots
- ◊ Linear relationship and the correlation coefficient
- ◊ Identifying outliers and clustering in scatter plots
- ◊ Finding outliers in a data set
- ◊ Identifying solutions to a system of linear equations
- ◊ Graphically solving a system of linear equations
- ◊ Using a graphing calculator to solve a system of linear equations: Basic
- ◊ Using a graphing calculator to solve a system of linear equations: Advanced
- ◊ Writing a system of linear equations given its graph
- ◊ Solving a system of linear equations using substitution
- ◊ Solving a system of linear equations using elimination with addition
- ◊ Solving a system of linear equations using elimination with multiplication and addition
- ◊ Identifying the center and radius to graph a circle given its equation in general form: Advanced
- ◊ Writing an equation of a circle and identifying points that lie on the circle
- ◊ Deriving the equation of a circle using the Pythagorean Theorem
- ◊ Domains of higher root functions
- ◊ 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
- ◊ Domain and range from the graph of a discrete relation
- ◊ Finding domain and range from a linear graph in context
- ◊ 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
- ◊ Writing the equation of a secant line
- ◊ How the leading coefficient affects the graph of an absolute value function
- ◊ Composition of two functions: Domain and range

♦ Polynomial and Rational Functions (27 topics)

- ◊ Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients
- ◊ Rewriting a quadratic function in standard form
- ◊ Solving a quadratic equation by graphing
- ◊ Comparing properties of quadratic functions given in different forms
- ◊ Classifying the graph of a function
- ◊ Choosing a quadratic model and using it to make a prediction

- ◊ Identifying polynomial functions
- ◊ Dividing a polynomial by a monomial: Univariate
- ◊ Dividing a polynomial by a monomial: Multivariate
- ◊ Remainder theorem: Advanced
- ◊ Closure properties of integers and polynomials
- ◊ Descartes' Rule of Signs
- ◊ Using the conjugate zeros theorem to find all zeros of a polynomial
- ◊ Linear factors theorem and conjugate zeros theorem
- ◊ Writing the equation of a rational function given its graph
- ◊ Identifying direct variation equations
- ◊ Identifying direct variation from ordered pairs and writing equations
- ◊ Writing a direct variation equation
- ◊ Word problem on direct variation
- ◊ Interpreting direct variation from a graph
- ◊ Writing an inverse variation equation
- ◊ Identifying direct and inverse variation equations
- ◊ Identifying direct and inverse variation from ordered pairs and writing equations
- ◊ Word problem on inverse variation
- ◊ Word problem on inverse variation involving the completion of a task
- ◊ Writing an equation that models variation
- ◊ Word problem on combined variation

♦ Exponential and Logarithmic Functions (12 topics)

- ◊ Finding domain and range from the graph of an exponential function
- ◊ Calculating and comparing simple interest and 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
- ◊ Choosing an exponential model and using it to make a prediction
- ◊ Comparing linear, polynomial, and exponential functions
- ◊ Graphing a logarithmic function: Advanced
- ◊ Expanding a logarithmic expression: Problem type 3
- ◊ Change of base for logarithms: Problem type 2
- ◊ Solving an exponential equation by finding common bases: Linear and quadratic exponents
- ◊ Solving an exponential equation by using substitution and quadratic factoring

♦ Trigonometric Functions (38 topics)

- ◊ Converting degrees−minutes−seconds to decimal degrees
- ◊ Converting decimal degrees to degrees−minutes−seconds
- ◊ 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 an angle and an arc length in a real−world situation
- ◊ Relating two angle measures in a real−world situation that involves interlocking gears
- ◊ 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
- ◊ Finding a point on the unit circle given one coordinate and the quadrant

- ◊ 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 symmetries on the unit circle to understand trigonometric identities: Problem type 2
- ◊ Simplifying a trigonometric expression: Rationalizing the denominator using conjugates
- ◊ Using a calculator to approximate cosecant, secant, and cotangent values
- ◊ Special right triangles: Exact answers
- ◊ 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
- ◊ 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
- ◊ Composition of trigonometric functions with variable expressions as inputs: Problem type 2

♦ Trigonometric Identities and Equations (20 topics)

- ◊ Proving an identity using fundamental trigonometric identities: Problem type 8
- ◊ Proving trigonometric identities using odd and even identities
- ◊ Proving identities involving trigonometric functions and logarithmic functions
- ◊ 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
- ◊ Finding solutions in an interval for an equation involving a trigonometric expression and either exponentials or logarithms
- ◊ 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 equation
- ◊ Using a graphing calculator to solve a trigonometric inequality
- ◊ Solving a trigonometric equation involving a squared function: Problem type 1
- ◊ Solving a trigonometric equation involving a squared function: Problem type 2
- ◊ Solving a trigonometric equation involving more than one function
- ◊ Solving a trigonometric equation involving an angle multiplied by a constant
- ◊ Finding solutions in an interval for a trigonometric equation involving sine and cosine using sum and difference identities
- ◊ Solving a trigonometric equation using sum and difference identities
- ◊ Solving a trigonometric equation using double−angle identities
- ◊ Solving a trigonometric equation using half−angle identities

♦ Additional Topics in Trigonometry (60 topics)

- ◊ Proving the law of sines
- ◊ Proving the law of cosines
- ◊ Using trigonometry to find the area of a right triangle

◊ Using trigonometry to find the area of a triangle
◊ Expressing the area of a triangle in terms of the sine of one of its angles
◊ Heron's formula
◊ 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
◊ Finding magnitudes of forces related to a sum of three vectors
◊ Finding magnitudes of forces related to an object suspended by cables
◊ Dot product of vectors given in 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
◊ Using the dot product to find perpendicular vectors
◊ Finding the component of a vector along another vector
◊ 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
◊ Plotting points in polar coordinates
◊ Multiple representations of polar coordinates
◊ Converting rectangular coordinates to polar coordinates: Special angles
◊ Converting rectangular coordinates to polar coordinates: Decimal answers
◊ Converting polar coordinates to rectangular coordinates
◊ 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
◊ 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
◊ Identifying symmetries of graphs given their polar equations
◊ 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

♦ Systems of Equations and Matrices (72 topics)

- ◊ Classifying systems of linear equations from graphs
- ◊ Solving a system of linear equations with fractional coefficients
- ◊ Solving a system of linear equations with decimal coefficients
- ◊ Solving a 2x2 system of linear equations that is inconsistent or consistent dependent
- ◊ Creating an inconsistent system of linear equations
- ◊ Identifying the operations used to create equivalent systems of equations
- ◊ Consistency and independence of a system of linear equations
- ◊ Interpreting the graphs of two functions
- ◊ Solving a word problem involving a sum and another basic relationship using a system of linear equations
- ◊ Solving a word problem using a system of linear equations of the form $Ax + By = C$
- ◊ Solving a word problem using a system of linear equations of the form $y = mx + b$
- ◊ Solving a value mixture problem using a system of linear equations
- ◊ Solving a percent mixture problem using a system of linear equations
- ◊ Solving a distance, rate, time problem using a system of linear equations
- ◊ Solving a tax rate or interest rate problem using a system of linear equations
- ◊ Introduction to solving a 3x3 system of linear equations
- ◊ Solving a 3x3 system of linear equations: Problem type 1
- ◊ Solving a 3x3 system of linear equations: Problem type 2
- ◊ Solving a 3x3 system of linear equations that is inconsistent or consistent dependent
- ◊ Solving a word problem using a 3x3 system of linear equations: Problem type 1
- ◊ Solving a word problem using a 3x3 system of linear equations: Problem type 2
- ◊ Scalar multiplication of a matrix
- ◊ Addition or subtraction of matrices
- ◊ Linear combination of matrices
- ◊ Squaring and multiplying 2x2 matrices
- ◊ Multiplication of matrices: Basic
- ◊ Multiplication of matrices: Advanced
- ◊ Word problem involving multiplication of matrices
- ◊ Finding the inverse of a 2x2 matrix
- ◊ Finding the inverse of a 3x3 matrix
- ◊ Finding the determinant of a 2x2 matrix
- ◊ Finding the determinant of a 3x3 matrix
- ◊ Completing Gauss–Jordan elimination with a 2x2 matrix
- ◊ Gauss–Jordan elimination with a 2x2 matrix
- ◊ Writing solutions to 3x3 systems of linear equations from augmented matrices
- ◊ Completing Gauss–Jordan elimination with a 3x3 matrix
- ◊ Solving a system of linear equations given its augmented matrix
- ◊ Finding the inverse of a matrix to solve a 2x2 system of linear equations
- ◊ Using the inverse of a matrix to solve a 3x3 system of linear equations
- ◊ Using Cramer's rule to solve a 2x2 system of linear equations
- ◊ Using Cramer's rule to solve a 3x3 system of linear equations
- ◊ Introduction to partial fraction decomposition with distinct linear factors
- ◊ Partial fraction decomposition with distinct linear factors
- ◊ Partial fraction decomposition with repeated linear factors
- ◊ Partial fraction decomposition with an irreducible quadratic factor
- ◊ Partial fraction decomposition with repeated, irreducible quadratic factors
- ◊ Graphically solving a system of linear and quadratic equations

- ◊ Using a graphing calculator to solve a nonlinear system of equations: Basic
- ◊ Using a graphing calculator to solve a nonlinear system of equations: Advanced
- ◊ Using a graphing calculator to solve an exponential or logarithmic equation
- ◊ Solving a system of linear and quadratic equations
- ◊ Solving a system of nonlinear equations: Problem type 1
- ◊ Solving a system of nonlinear equations: Problem type 2
- ◊ Solving a word problem involving geometry using a system of nonlinear equations
- ◊ Identifying solutions to a linear inequality in two variables
- ◊ Graphing a linear inequality in the plane: Vertical or horizontal line
- ◊ Graphing a linear inequality in the plane: Slope−intercept form
- ◊ Graphing a linear inequality in the plane: Standard form
- ◊ Writing an inequality given its graph in the plane: Horizontal or vertical boundary line
- ◊ Writing an inequality given its graph in the plane: Slanted boundary line
- ◊ Graphing a quadratic inequality: Problem type 1
- ◊ Graphing a quadratic inequality: Problem type 2
- ◊ Graphing an inequality involving a circle
- ◊ Graphing a system of two linear inequalities: Basic
- ◊ Graphing a system of two linear inequalities: Advanced
- ◊ Graphing a system of three linear inequalities
- ◊ Graphing a system of nonlinear inequalities: Problem type 1
- ◊ Writing a multi−step inequality for a real−world situation
- ◊ Solving a word problem using a system of linear inequalities: Problem type 1
- ◊ Solving a word problem using a system of linear inequalities: Problem type 2
- ◊ Linear programming
- ◊ Solving a word problem using linear programming

♦ Conic Sections (38 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 $y = a(x-h)^2 + k$
- ◊ 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 given its equation in standard form
- ◊ Graphing an ellipse centered at the origin: $Ax^2 + By^2 = C$
- ◊ Graphing an ellipse given its equation in general form
- ◊ Finding the center, vertices, and foci of an ellipse
- ◊ Finding the foci of an ellipse given its equation in general form
- ◊ Writing an equation of an ellipse given the center, an endpoint of an axis, and the length of the other axis
- ◊ Writing an equation of an ellipse given the foci and the major axis length
- ◊ Graphing a system of nonlinear inequalities: Problem type 2
- ◊ 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
- ◊ 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

♦ Sequences, Series, and Probability (67 topics)

- ◊ Finding the first terms of an arithmetic sequence using an explicit rule
- ◊ Finding the first terms of a geometric sequence using an explicit rule
- ◊ Finding the first terms of a sequence using an explicit rule with multiple occurrences of n
- ◊ Finding the next terms of an arithmetic sequence with integers
- ◊ Finding the first terms of a sequence using a recursive rule
- ◊ Identifying arithmetic sequences and finding the common difference
- ◊ Finding a specified term of an arithmetic sequence given the first terms
- ◊ Finding a specified term of an arithmetic sequence given the common difference and first term
- ◊ Finding a specified term of an arithmetic sequence given two terms of the sequence
- ◊ Writing an explicit rule for an arithmetic sequence
- ◊ Writing a recursive rule for an arithmetic sequence
- ◊ Sum of the first n terms of an arithmetic sequence
- ◊ Finding the next terms of a geometric sequence with signed numbers
- ◊ Identifying arithmetic and geometric sequences
- ◊ Identifying geometric sequences and finding the common ratio
- ◊ Finding a specified term of a geometric sequence given the first terms
- ◊ Finding a specified term of a geometric sequence given the common ratio and first term
- ◊ Finding a specified term of a geometric sequence given two terms of the sequence
- ◊ Arithmetic and geometric sequences: Identifying and writing an explicit rule
- ◊ Writing recursive rules for arithmetic and geometric sequences
- ◊ Sum of the first n terms of a geometric sequence
- ◊ Sum of an infinite geometric series
- ◊ Identifying linear, quadratic, and exponential functions given ordered pairs
- ◊ Factorial expressions
- ◊ Interpreting a tree diagram
- ◊ Introduction to the counting principle
- ◊ Counting principle
- ◊ Computing permutations and combinations
- ◊ Introduction to permutations and combinations
- ◊ Permutations and combinations: Problem type 1
- ◊ Permutations and combinations: Problem type 2
- ◊ Permutations and combinations: Problem type 3
- ◊ Binomial formula
- ◊ Determining a sample space and outcomes for an event: Experiment involving a single selection
- ◊ Determining a sample space and outcomes for an event: Experiment involving multiple selections
- ◊ Probability involving one die or choosing from n distinct objects
- ◊ Probability involving choosing from objects that are not distinct
- ◊ Experimental and theoretical probability
- ◊ Outcomes and event probability
- ◊ Probabilities of a permutation and a combination

- ◊ Area as probability
- ◊ Probability of independent events: Decimal answers
- ◊ Probability of dependent events: Decimal answers
- ◊ Probabilities of draws with replacement
- ◊ Probabilities of draws without replacement
- ◊ Interpreting a Venn diagram of 2 sets
- ◊ Interpreting a Venn diagram of 3 sets
- ◊ Introduction to shading a Venn diagram with 2 events
- ◊ Shading a Venn diagram with 2 events: Unions, intersections, and complements
- ◊ Shading a Venn diagram with 3 sets to represent a group
- ◊ Probabilities involving two rolls of a die
- ◊ Determining outcomes for unions, intersections, and complements of events
- ◊ Using a Venn diagram to understand the addition rule for probability
- ◊ Outcomes and event probability: Addition rule
- ◊ Word problem involving the probability of a union or an intersection
- ◊ Identifying independent events given values of probabilities
- ◊ Probability of the union and intersection of independent events
- ◊ Probability of the union of mutually exclusive events and independent events
- ◊ Using a Venn diagram to understand the multiplication rule for probability
- ◊ Outcomes and event probability: Conditional probability
- ◊ Computing conditional probability using a two−way frequency table
- ◊ Computing conditional probability to make an inference using a two−way frequency table
- ◊ Conditional probability: Basic
- ◊ Intersection and conditional probability
- ◊ Binomial problems: Basic
- ◊ Binomial problems: Advanced
- ◊ Using a random number table to make a fair decision

♦ Limits and Continuity (15 topics)

- ◊ Estimating a limit numerically
- ◊ Finding limits from a graph
- ◊ Finding a limit by using the limit laws: Problem type 1
- ◊ Finding limits for a piecewise−defined function
- ◊ Finding a limit by using the limit laws: Problem type 2
- ◊ Finding a limit by using the limit laws: Problem type 3
- ◊ Squeeze Theorem
- ◊ Determining points of discontinuity from a graph
- ◊ Determining a parameter to make a function continuous
- ◊ Infinite limits and graphs
- ◊ Limits at infinity and graphs
- ◊ Limits at infinity and rational functions
- ◊ Infinite limits and rational functions
- ◊ Finding a limit of a trigonometric function by using continuity
- ◊ Finding a limit by using special trigonometric limits

***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.*

