



Intermediate Algebra and PreCalculus

This course covers the topics shown below.

Students navigate learning paths based on their level of readiness.

Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum Show All (830 topics + 543 additional topics)

- Real Numbers and Linear Equations (158 topics)
 - ◆ Fractions (4 topics)
 - ◇ Simplifying a fraction
 - ◇ Addition or subtraction of fractions with different denominators
 - ◇ Fraction multiplication
 - ◇ Fraction division
 - ◆ Plotting and Ordering (6 topics)
 - ◇ Fractional position on a number line
 - ◇ Plotting integers on a number line
 - ◇ Ordering integers
 - ◇ Square root of a perfect square
 - ◇ Using a calculator to approximate a square root
 - ◇ Absolute value of a number
 - ◆ Operations with Rational Numbers (32 topics)
 - ◇ Integer addition: Problem type 1
 - ◇ Integer addition: Problem type 2
 - ◇ Integer subtraction: Problem type 1
 - ◇ Integer subtraction: Problem type 2
 - ◇ Integer subtraction: Problem type 3
 - ◇ Addition and subtraction with 3 integers
 - ◇ Addition and subtraction with 4 or 5 integers
 - ◇ Word problem with addition or subtraction of integers
 - ◇ Integer multiplication and division
 - ◇ Multiplication of 3 or 4 integers
 - ◇ Division involving zero
 - ◇ Identifying numbers as integers or non-integers
 - ◇ Identifying numbers as rational or irrational
 - ◇ Least common multiple of 2 numbers
 - ◇ Least common multiple of 3 numbers
 - ◇ Signed fraction addition or subtraction: Basic
 - ◇ Signed fraction subtraction involving double negation
 - ◇ Signed fraction addition or subtraction: Advanced
 - ◇ Addition and subtraction of 3 fractions involving signs
 - ◇ Signed fraction multiplication: Basic
 - ◇ Signed fraction multiplication: Advanced
 - ◇ Signed fraction division
 - ◇ Signed decimal addition and subtraction
 - ◇ Signed decimal addition and subtraction with 3 numbers
 - ◇ Operations with absolute value: Problem type 1
 - ◇ Operations with absolute value: Problem type 2
 - ◇ Computing the distance between two integers on a number line

- ◇ Exponents and integers: Problem type 1
- ◇ Exponents and integers: Problem type 2
- ◇ Exponents and signed fractions
- ◇ Order of operations with integers
- ◇ Order of operations with integers and exponents
- ◆ Evaluating Expressions (3 topics)
 - ◇ 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
- ◆ Properties of Real numbers (12 topics)
 - ◇ Combining like terms: Whole number coefficients
 - ◇ Combining like terms: Integer coefficients
 - ◇ Introduction to properties of addition
 - ◇ Properties of addition
 - ◇ Multiplying a constant and a linear monomial
 - ◇ Distributive property: Whole number coefficients
 - ◇ Distributive property: Integer coefficients
 - ◇ Introduction to properties of multiplication
 - ◇ Properties of real numbers
 - ◇ Using distribution and combining like terms to simplify: Univariate
 - ◇ Using distribution with double negation and combining like terms to simplify: Multivariate
 - ◇ Combining like terms in a quadratic expression
- ◆ Geometry (6 topics)
 - ◇ Perimeter of a square or a rectangle
 - ◇ Area of a square or a rectangle
 - ◇ Area of a triangle
 - ◇ Circumference of a circle
 - ◇ Circumference and area of a circle
 - ◇ Volume of a rectangular prism
- ◆ Linear Equations (24 topics)
 - ◇ Additive property of equality with decimals
 - ◇ Additive property of equality with integers
 - ◇ Additive property of equality with signed fractions
 - ◇ Multiplicative property of equality with whole numbers
 - ◇ Multiplicative property of equality with fractions
 - ◇ Multiplicative property of equality with decimals
 - ◇ Multiplicative property of equality with integers
 - ◇ Multiplicative property of equality with signed fractions
 - ◇ Identifying solutions to a linear equation in one variable: Two-step equations
 - ◇ Additive property of equality with a negative coefficient
 - ◇ Solving a two-step equation with integers
 - ◇ Solving a multi-step equation given in fractional form
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on the same side
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
 - ◇ 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 equations with zero, one, or infinitely many solutions
- ◇ Solving a proportion of the form $x/a = b/c$
- ◇ Solving a proportion of the form $(x+a)/b = c/d$
- ◆ Solving Formulas for a Variable (8 topics)
 - ◇ Solving for a variable in terms of other variables using addition or subtraction: Basic
 - ◇ Solving for a variable in terms of other variables using 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
 - ◇ Converting between temperatures in Fahrenheit and Celsius
- ◆ Applications (18 topics)
 - ◇ Writing a one-step expression for a real-world situation
 - ◇ Translating a phrase into a one-step expression
 - ◇ Translating a phrase into a two-step expression
 - ◇ Translating a sentence into a one-step equation
 - ◇ Translating a sentence into a multi-step equation
 - ◇ Solving a fraction word problem using a linear equation of the form $Ax = B$
 - ◇ 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 word problem involving consecutive integers
 - ◇ Solving a value mixture problem using a linear equation
 - ◇ Solving a one-step word problem using the formula $d = rt$
 - ◇ Solving a word problem involving rates and time conversion
 - ◇ Solving a distance, rate, time problem using a linear equation
 - ◇ Finding side lengths of rectangles given one dimension and an area or a perimeter
 - ◇ Finding a side length given the perimeter and side lengths with variables
 - ◇ Finding the dimensions of a rectangle given its perimeter and a relationship between sides
 - ◇ Finding the perimeter or area of a rectangle given one of these values
- ◆ Applications Involving Percents (9 topics)
 - ◇ Finding the final amount given the original amount and a percentage increase or decrease
 - ◇ Finding the sale price given the original price and percent discount
 - ◇ Finding the sale price without a calculator 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
 - ◇ Finding the percentage increase or decrease: Basic
 - ◇ Computing a percent mixture
 - ◇ Solving a percent mixture problem using a linear equation
 - ◇ Finding simple interest without a calculator
- ◆ Writing and Graphing Linear Inequalities (9 topics)
 - ◇ Translating a sentence by using an inequality symbol
 - ◇ Translating a sentence into a one-step inequality
 - ◇ Writing an inequality for a real-world situation
 - ◇ Graphing a linear inequality on the number line
 - ◇ Translating a sentence into a compound inequality
 - ◇ Graphing a compound inequality on the number line
 - ◇ Writing sets of integers using set-builder and roster forms

- ◇ Set-builder and interval notation
- ◇ Union and intersection of finite sets
- ◆ Linear Inequalities and Applications (16 topics)
 - ◇ Identifying solutions to a two-step linear inequality in one variable
 - ◇ Additive property of inequality with whole numbers
 - ◇ Additive property of inequality with integers
 - ◇ Additive property of inequality with signed fractions
 - ◇ Additive property of inequality with signed decimals
 - ◇ Multiplicative property of inequality with integers
 - ◇ Multiplicative property of inequality with signed fractions
 - ◇ Solving a two-step linear inequality: Problem type 1
 - ◇ Solving a two-step linear inequality: Problem type 2
 - ◇ 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 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
- ◆ Absolute Value Equations (6 topics)
 - ◇ Introduction to solving an absolute value equation
 - ◇ Solving an absolute value equation: Problem type 1
 - ◇ Solving an absolute value equation: Problem type 2
 - ◇ Solving an absolute value equation: Problem type 3
 - ◇ Solving an absolute value equation: Problem type 4
 - ◇ Solving an absolute value equation of the form $|ax+b| = |cx+d|$
- ◆ Absolute Value Inequalities (5 topics)
 - ◇ Solving an absolute value inequality: Problem type 1
 - ◇ 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
- Lines, Functions, and Systems (102 topics)
 - ◆ The Coordinate Plane, Distance, and Midpoint (10 topics)
 - ◇ Reading a point in the coordinate plane
 - ◇ Plotting a point in the coordinate plane
 - ◇ Naming the quadrant or axis of a point given its graph
 - ◇ Naming the quadrant or axis of a point given its coordinates
 - ◇ Naming the quadrant or axis of a point given the signs of its coordinates
 - ◇ 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
 - ◆ Graphing and Intercepts (10 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 given its x - and y -intercepts
- ◇ Graphing a line by first finding its x - and y -intercepts
- ◆ Slope (6 topics)
 - ◇ Classifying slopes given graphs of lines
 - ◇ 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
 - ◇ Graphing a line through a given point with a given slope
- ◆ Equations of Lines (15 topics)
 - ◇ Rewriting a linear equation in the form $Ax + By = C$
 - ◇ 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 $Ax + By = C$
 - ◇ Identifying parallel and perpendicular lines from equations
 - ◇ Writing equations of lines parallel and perpendicular to a given line through a point
- ◆ Applications (7 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
 - ◇ Interpreting a line graph
 - ◇ 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 the slope and a point
 - ◇ Application problem with a linear function: Finding a coordinate given two points
- ◆ Introduction to Functions (9 topics)
 - ◇ Identifying functions from relations
 - ◇ Vertical line test
 - ◇ Domain and range from ordered pairs
 - ◇ Table for a linear function
 - ◇ Evaluating functions: Linear and quadratic or cubic
 - ◇ Evaluating a piecewise-defined function
 - ◇ Finding outputs of a 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 (23 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 discrete relation
 - ◇ Domain and range from the graph of a continuous function
 - ◇ Domain and range from the graph of a piecewise function
 - ◇ Finding intercepts of a nonlinear function given its graph
 - ◇ Finding where a function is increasing, decreasing, or constant given the graph

- ◇ 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 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 function of the form $f(x) = ax^2$
- ◇ Graphing a function of the form $f(x) = ax^2 + c$
- ◇ Graphing a cubic function of the form $y = ax^3$
- ◇ 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
- ◆ Systems of Linear Equations in Two Variables (10 topics)
 - ◇ Identifying solutions to a system of linear equations
 - ◇ Classifying systems of linear equations from graphs
 - ◇ Graphically solving a system of linear equations
 - ◇ Solving a system of linear equations of the form $y = mx + b$
 - ◇ Solving a system of linear equations using substitution
 - ◇ Solving a system of linear equations using elimination with addition
 - ◇ Solving a system of linear equations using elimination with multiplication and addition
 - ◇ Solving a system of linear equations with fractional coefficients
 - ◇ Solving a system of linear equations with decimal coefficients
 - ◇ Solving a 2x2 system of linear equations that is inconsistent or consistent dependent
- ◆ Applications (7 topics)
 - ◇ 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 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
- ◆ Graphing Linear Inequalities (4 topics)
 - ◇ 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
- ◆ Systems of Linear Inequalities (1 topics)
 - ◇ Graphing a system of two linear inequalities: Basic
- Exponents, Polynomials, and Factoring (105 topics)
 - ◆ Properties of Exponents (16 topics)
 - ◇ Understanding the product rule of exponents
 - ◇ Introduction to the product rule of exponents
 - ◇ Product rule with positive exponents: Univariate
 - ◇ Product rule with positive exponents: Multivariate
 - ◇ Understanding the power rules of exponents
 - ◇ 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
- ◇ Power and product rules with positive exponents
- ◇ 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
- ◇ Simplifying a ratio of multivariate monomials: Advanced
- ◇ Power and quotient rules with positive exponents
- ◆ Negative Exponents (14 topics)
 - ◇ Evaluating expressions with exponents of zero
 - ◇ Evaluating an expression with a negative exponent: Whole number base
 - ◇ Evaluating an expression with a negative exponent: Positive fraction base
 - ◇ Evaluating an expression with a negative exponent: Negative integer base
 - ◇ 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 (7 topics)
 - ◇ 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
 - ◇ Dividing numbers written in scientific notation: Basic
 - ◇ Dividing numbers written in scientific notation: Advanced
- ◆ Polynomial Addition, Subtraction, and Multiplication (17 topics)
 - ◇ Degree and leading coefficient of a univariate polynomial
 - ◇ Simplifying a sum or difference of two univariate polynomials
 - ◇ Simplifying a sum or difference of three univariate polynomials
 - ◇ Simplifying a sum or difference of multivariate polynomials
 - ◇ Multiplying a univariate polynomial by a monomial with a 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
 - ◇ Multiplying conjugate binomials: Multivariate
 - ◇ 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
- ◆ Polynomial Division (6 topics)
 - ◇ Dividing a polynomial by a monomial: Univariate
 - ◇ Dividing a polynomial by a monomial: Multivariate
 - ◇ Polynomial long division: Problem type 1

- ◇ Polynomial long division: Problem type 2
- ◇ Polynomial long division: Problem type 3
- ◇ Synthetic division
- ◆ Factoring Using the GCF (9 topics)
 - ◇ Prime numbers
 - ◇ Prime factorization
 - ◇ Greatest common factor of 2 numbers
 - ◇ Factoring a linear binomial
 - ◇ Introduction to the GCF of two monomials
 - ◇ Greatest common factor of three univariate 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 by Grouping (5 topics)
 - ◇ 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 Quadratic Trinomials (9 topics)
 - ◇ Factoring a quadratic with leading coefficient 1
 - ◇ Factoring a quadratic in two variables 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 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 Special Products (10 topics)
 - ◇ Factoring a perfect square trinomial with leading coefficient 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 one variable: Basic
 - ◇ Factoring a difference of squares in one variable: Advanced
 - ◇ Factoring a difference of squares in two variables
 - ◇ Factoring a polynomial involving a GCF and a difference of squares: Univariate
 - ◇ Factoring a 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
- ◆ Solving Quadratic Equations by Factoring (8 topics)
 - ◇ Solving an equation written in factored form
 - ◇ Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$
 - ◇ Finding the roots of a quadratic equation with leading coefficient 1
 - ◇ Finding the roots of a quadratic equation with leading coefficient greater than 1
 - ◇ Solving a quadratic equation needing simplification
 - ◇ Solving a word problem using a quadratic equation with rational roots
 - ◇ Roots of a product of polynomials
 - ◇ Writing a quadratic equation given the roots and the leading coefficient
- ◆ Pythagorean Theorem (4 topics)
 - ◇ Introduction to the Pythagorean Theorem
 - ◇ Pythagorean Theorem
 - ◇ Word problem involving the Pythagorean Theorem

- ◇ Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
- Rational Expressions (71 topics)
 - ◆ Simplifying Expressions (11 topics)
 - ◇ Restriction on a variable in a denominator: Linear
 - ◇ Restriction on a variable in a denominator: Quadratic
 - ◇ Evaluating a rational function: Problem type 1
 - ◇ Evaluating a rational function: Problem type 2
 - ◇ Domain of a rational function: Excluded values
 - ◇ Simplifying a ratio of factored polynomials: Linear factors
 - ◇ Simplifying a ratio of polynomials using GCF factoring
 - ◇ Simplifying a ratio of linear polynomials: 1, -1, and no simplification
 - ◇ Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
 - ◇ Simplifying a ratio of polynomials: Problem type 1
 - ◇ Simplifying a ratio of polynomials: Problem type 2
 - ◆ Multiplication and Division (6 topics)
 - ◇ Multiplying rational expressions involving multivariate monomials
 - ◇ Multiplying rational expressions involving linear expressions
 - ◇ Multiplying rational expressions involving quadratics with leading coefficients of 1
 - ◇ Dividing rational expressions involving multivariate monomials
 - ◇ Dividing rational expressions involving linear expressions
 - ◇ Dividing rational expressions involving quadratics with leading coefficients of 1
 - ◆ Addition and Subtraction (23 topics)
 - ◇ Introduction to the LCM of two monomials
 - ◇ Least common multiple of two monomials
 - ◇ Finding the LCD of rational expressions with linear denominators: Relatively prime
 - ◇ 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 with polynomial denominators
 - ◇ Writing equivalent rational expressions involving opposite factors
 - ◇ 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 denominators ax^n and bx^m
 - ◇ Adding rational expressions with linear denominators without common factors: Basic
 - ◇ 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
 - ◆ Complex Fractions (11 topics)
 - ◇ Complex fraction without variables: Problem type 1
 - ◇ Complex fraction without variables: Problem type 2
 - ◇ Complex fraction involving univariate monomials
 - ◇ Complex fraction involving multivariate monomials
 - ◇ Complex fraction: GCF factoring
 - ◇ Complex fraction: Quadratic factoring
 - ◇ Complex fraction made of sums involving rational expressions: Problem type 1

- ◇ 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 6
- ◆ Rational Equations (13 topics)
 - ◇ Solving a proportion of the form $a/(x+b) = c/x$
 - ◇ 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 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
- ◆ Applications (7 topics)
 - ◇ 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
 - ◇ 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 involving multiple rates
 - ◇ Solving a work problem using a rational equation
 - ◇ Solving a distance, rate, time problem using a rational equation
- Radicals and Quadratic Functions (110 topics)
 - ◆ Roots of Perfect Powers (9 topics)
 - ◇ Finding all square roots of a number
 - ◇ Square root of a rational perfect square
 - ◇ Square roots of perfect squares with signs
 - ◇ Introduction to simplifying a radical expression with an even exponent
 - ◇ Square root of a perfect square monomial
 - ◇ Cube root of an integer
 - ◇ Finding n^{th} roots of perfect n^{th} powers with signs
 - ◇ Finding the n^{th} root of a perfect n^{th} power fraction
 - ◇ Finding the n^{th} root of a perfect n^{th} power monomial
 - ◆ Radical Functions (7 topics)
 - ◇ Table for a square root function
 - ◇ Evaluating a cube root function
 - ◇ Domain of a square root function: Basic
 - ◇ Domain of a square root function: Advanced
 - ◇ Graphing a square root function: Problem type 1
 - ◇ Graphing a square root function: Problem type 2
 - ◇ Matching parent graphs with their equations
 - ◆ Rational Exponents (10 topics)
 - ◇ Converting between radical form and exponent form
 - ◇ Rational exponents: Unit fraction exponents and whole number bases
 - ◇ Rational exponents: Unit fraction exponents and bases involving signs
 - ◇ Rational exponents: Non-unit fraction exponent with a whole number base
 - ◇ 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 Expressions (10 topics)
 - ◇ Simplifying the square root of a whole number less than 100
 - ◇ Simplifying the square root of a whole number greater than 100
 - ◇ Simplifying a radical expression with an even exponent
 - ◇ Introduction to simplifying a radical expression with an odd exponent
 - ◇ Simplifying a radical expression with an odd exponent
 - ◇ Simplifying a radical expression with two variables
 - ◇ Simplifying a higher root of a whole number
 - ◇ Introduction to simplifying a higher radical expression
 - ◇ Simplifying a higher radical expression: Univariate
 - ◇ Simplifying a higher radical expression: Multivariate
- ◆ Addition and Subtraction (5 topics)
 - ◇ Introduction to square root addition or subtraction
 - ◇ Square root addition or subtraction
 - ◇ Square root addition or subtraction with three terms
 - ◇ Introduction to simplifying a sum or difference of radical expressions: Univariate
 - ◇ Simplifying a sum or difference of radical expressions: Univariate
- ◆ Multiplication (9 topics)
 - ◇ Introduction to square root multiplication
 - ◇ Square root multiplication: Basic
 - ◇ Square root multiplication: Advanced
 - ◇ Introduction to simplifying a product of radical expressions: Univariate
 - ◇ 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
 - ◇ Special products of radical expressions: Conjugates and squaring
- ◆ Division and Rationalization (8 topics)
 - ◇ 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: Quotient involving a monomial
 - ◇ Rationalizing a denominator using conjugates: Integer numerator
 - ◇ Rationalizing a denominator using conjugates: Square root in numerator
 - ◇ Rationalizing a denominator using conjugates: Variable in denominator
- ◆ Radical Equations (14 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 a radical equation with a quadratic expression under the radical
 - ◇ Solving a radical equation with two radicals that simplifies to $\sqrt{x} = a$
 - ◇ Solving a radical equation that simplifies to a quadratic equation: Two radicals
 - ◇ Solving for a variable in terms of other variables in an equation involving radicals
 - ◇ Word problem involving radical equations: Basic
 - ◇ Word problem involving radical equations: Advanced
 - ◇ Solving an equation with a root index greater than 2: Problem type 1

- ◇ Solving an equation with a root index greater than 2: Problem type 2
- ◆ Complex Numbers (6 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
 - ◇ Simplifying a power of i
- ◆ Quadratic Equations (10 topics)
 - ◇ Solving an equation of the form $x^2 = a$ using the square root property
 - ◇ Solving a quadratic equation using the square root property: 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
- ◆ Quadratic Inequalities and Higher Degree Equations (5 topics)
 - ◇ Solving a quadratic inequality written in factored form
 - ◇ Solving a quadratic inequality
 - ◇ Solving an equation using the odd-root property: Problem type 1
 - ◇ Solving an equation using the odd-root property: Problem type 2
 - ◇ Solving an equation that can be written in quadratic form: Problem type 1
- ◆ Quadratic Functions (17 topics)
 - ◇ Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
 - ◇ Graphing a parabola of the form $y = (x-h)^2 + k$
 - ◇ 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
- Function Operations and Inverses (49 topics)
 - ◆ More on Function Evaluation and Properties (13 topics)
 - ◇ Evaluating functions: Absolute value, rational, radical
 - ◇ 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 of a rational function: Interval notation
 - ◇ Finding the domain of a fractional function involving radicals
 - ◇ Finding a difference quotient for a linear or quadratic function
 - ◇ Finding a difference quotient for a rational function

- ◇ 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 and Graphs of Functions (15 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
 - ◇ Graphing an absolute value equation in the plane: Basic
 - ◇ Graphing an absolute value equation in the plane: Advanced
 - ◇ 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
- ◆ Function Operations (13 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
 - ◇ Determining whether an equation defines a function: Basic
 - ◇ Determining whether an equation defines a function: Advanced
- ◆ Inverse Functions (8 topics)
 - ◇ 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
- 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
- Conic Sections and Nonlinear Systems (8 topics)
 - ◆ 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
- ◆ Intercepts and Symmetries of Nonlinear Equations (2 topics)
 - ◇ 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
- Polynomial and Rational Functions (42 topics)
 - ◆ 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
 - ◆ Remainder and Factor Theorems (2 topics)
 - ◇ 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 Polynomial 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 (6 topics)
 - ◇ 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
- 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 (55 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
- ◆ 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(*) (543 additional topics)
 - ◆ Real Numbers and Linear Equations (62 topics)
 - ◇ Fractional part of a circle
 - ◇ Using a common denominator to order fractions
 - ◇ Reading decimal position on a number line: Tenths
 - ◇ Reading decimal position on a number line: Hundredths
 - ◇ Plotting rational numbers on a number line
 - ◇ Estimating a square root
 - ◇ Ordering real numbers
 - ◇ Signed decimal multiplication
 - ◇ Signed decimal division
 - ◇ Evaluating a linear expression: Signed decimal addition and subtraction
 - ◇ Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
 - ◇ Identifying properties used to simplify an algebraic expression
 - ◇ Sides of polygons having the same perimeter
 - ◇ Area of a rectangle involving fractions
 - ◇ Area of a piecewise rectangular figure
 - ◇ Areas of rectangles with the same perimeter
 - ◇ 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 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
 - ◇ Solving an equation to find the value of an expression
 - ◇ Identifying properties used to solve a linear equation

- ◇ Solving a two–step equation with signed decimals
- ◇ 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
- ◇ Writing a multi–step equation for a real–world situation
- ◇ Word problem on unit rates associated with ratios of whole numbers: Decimal answers
- ◇ Finding the radius or the diameter of a circle given its circumference
- ◇ Circumference ratios
- ◇ Solving equations involving vertical angles
- ◇ Finding angle measures of a triangle given angles with variables
- ◇ Finding angle measures of an isosceles triangle given angles with variables
- ◇ Converting a repeating decimal to a fraction
- ◇ Converting between percentages and decimals
- ◇ Applying the percent equation: Problem type 1
- ◇ Applying the percent equation: Problem type 2
- ◇ Finding the multiplier to give a final amount after a percentage increase or decrease
- ◇ Finding the original amount given the result of a percentage increase or decrease
- ◇ Finding the percentage increase or decrease: Advanced
- ◇ Writing an inequality given a graph on the number line
- ◇ Writing a compound inequality given a graph on the number line
- ◇ Union and intersection of intervals
- ◇ Solving inequalities with no solution or all real numbers as solutions
- ◇ Translating a sentence into a multi–step inequality
- ◇ Solving a decimal word problem using a linear inequality with the variable on both sides
- ◇ Writing an absolute value inequality given a graph on the number line
- ◆ Lines, Functions, and Systems (77 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
 - ◇ Finding the coordinate that yields a given slope
 - ◇ Identifying linear equations: Advanced
 - ◇ Identifying linear functions given ordered pairs
 - ◇ 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 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
 - ◇ Identifying independent and dependent variables from equations or real–world situations
 - ◇ 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
- ◇ Domain and range of a linear function that models a real–world situation
- ◇ 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
- ◇ 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
- ◇ 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
- ◇ Solving a word problem using a system of linear equations of the form $y = mx + b$
- ◇ Introduction to solving a 3×3 system of linear equations
- ◇ Solving a 3×3 system of linear equations: Problem type 1
- ◇ Solving a 3×3 system of linear equations: Problem type 2
- ◇ Solving a 3×3 system of linear equations that is inconsistent or consistent dependent
- ◇ Solving a word problem using a 3×3 system of linear equations: Problem type 1
- ◇ Solving a word problem using a 3×3 system of linear equations: Problem type 2
- ◇ Scalar multiplication of a matrix
- ◇ Addition or subtraction of matrices
- ◇ Linear combination of matrices
- ◇ Squaring and multiplying 2×2 matrices
- ◇ Multiplication of matrices: Basic
- ◇ Multiplication of matrices: Advanced
- ◇ Word problem involving multiplication of matrices
- ◇ Finding the inverse of a 2×2 matrix
- ◇ Finding the inverse of a 3×3 matrix
- ◇ Finding the determinant of a 2×2 matrix
- ◇ Finding the determinant of a 3×3 matrix
- ◇ Completing Gauss–Jordan elimination with a 2×2 matrix
- ◇ Gauss–Jordan elimination with a 2×2 matrix
- ◇ Writing solutions to 3×3 systems of linear equations from augmented matrices
- ◇ Completing Gauss–Jordan elimination with a 3×3 matrix
- ◇ Solving a system of linear equations given its augmented matrix
- ◇ Finding the inverse of a matrix to solve a 2×2 system of linear equations
- ◇ Using the inverse of a matrix to solve a 3×3 system of linear equations
- ◇ Using Cramer's rule to solve a 2×2 system of linear equations
- ◇ Using Cramer's rule to solve a 3×3 system of linear equations
- ◇ Writing an inequality given its graph in the plane: Horizontal or vertical boundary line
- ◇ Writing an inequality given its graph in the plane: Slanted boundary line
- ◇ Graphing a system of two linear inequalities: Advanced
- ◇ Graphing a system of three linear inequalities
- ◇ 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
- ◆ Exponents, Polynomials, and Factoring (9 topics)
 - ◇ Ordering numbers with positive exponents
 - ◇ Ordering numbers with negative exponents
 - ◇ Multiplying numbers written in decimal form or scientific notation in a real–world situation

- ◇ Finding the scale factor between numbers given in scientific notation in a real–world situation
- ◇ Degree of a multivariate polynomial
- ◇ Closure properties of integers and polynomials
- ◇ Factoring a polynomial involving a GCF and a difference of squares: Multivariate
- ◇ Factoring out binomials from a polynomial: GCF factoring, advanced
- ◇ Using substitution to factor polynomials
- ◆ Rational Expressions (40 topics)
 - ◇ Simplifying a ratio of factored polynomials: Factors with exponents
 - ◇ Simplifying a ratio of polynomials: Problem type 3
 - ◇ Simplifying a ratio of multivariate polynomials
 - ◇ Multiplying rational expressions involving quadratics with leading coefficients greater than 1
 - ◇ Multiplying rational expressions involving multivariate quadratics
 - ◇ Dividing rational expressions involving quadratics with leading coefficients greater than 1
 - ◇ Dividing rational expressions involving multivariate quadratics
 - ◇ Multiplication and division of 3 rational expressions
 - ◇ Adding rational expressions with multivariate monomial denominators: Basic
 - ◇ Adding rational expressions with multivariate monomial denominators: Advanced
 - ◇ Adding 3 rational expressions with different quadratic denominators
 - ◇ Complex fraction made of sums involving rational expressions: Problem type 5
 - ◇ 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
 - ◇ Solving a rational equation that simplifies to quadratic: Proportional form, advanced
 - ◇ Word problem on proportions: Problem type 2
 - ◇ Similar polygons
 - ◇ Similar right triangles
 - ◇ Indirect measurement
 - ◇ Ratio of volumes
 - ◇ Ordering fractions with variables
 - ◇ 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
 - ◇ 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
- ◆ Radicals and Quadratic Functions (30 topics)
 - ◇ Square roots of integers raised to even exponents
 - ◇ Using absolute value to simplify square roots of perfect square monomials
 - ◇ Using absolute value to simplify higher radical expressions
 - ◇ Domains of higher root functions
 - ◇ Graphing a square root function: Problem type 3

- ◇ Graphing a cube root function
- ◇ 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: 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
- ◇ Classifying sums and products as rational or irrational
- ◇ 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
- ◇ Solving an equation with exponent $1/a$: Problem type 1
- ◇ Solving an equation with exponent $1/a$: Problem type 2
- ◇ Discriminant of a quadratic equation with a parameter
- ◇ Solving an equation that can be written in quadratic form: Problem type 2
- ◇ Solving an equation with a positive rational exponent
- ◇ Solving an equation with a negative rational exponent
- ◇ 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
- ◆ Function Operations and Inverses (4 topics)
 - ◇ Rewriting a multivariate function as a univariate function given a relationship between its variables
 - ◇ 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
- ◆ 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
- ◆ Conic Sections and Nonlinear Systems (44 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 focus of a parabola of the form $ay^2 + by + cx + d = 0$ or $ax^2 + bx + cy + d = 0$
 - ◇ Finding the vertex, focus, directrix, and axis of symmetry of a parabola
 - ◇ Writing an equation of a parabola given its graph

- ◇ Word problem involving a parabola
- ◇ Identifying the center and radius to graph a circle given its equation in general form: Advanced
- ◇ Writing an equation of a circle and identifying points that lie on the circle
- ◇ Deriving the equation of a circle using the Pythagorean Theorem
- ◇ Graphing an ellipse given its equation in standard form
- ◇ Graphing an ellipse centered at the origin: $Ax^2 + By^2 = C$
- ◇ Graphing an ellipse given its equation in general form
- ◇ Finding the center, vertices, and foci of an ellipse
- ◇ Finding the foci of an ellipse given its equation in general form
- ◇ Writing an equation of an ellipse given the center, an endpoint of an axis, and the length of the other axis
- ◇ Writing an equation of an ellipse given the foci and the major axis length
- ◇ Word problem involving an ellipse
- ◇ Graphing a hyperbola given its equation in standard form
- ◇ Graphing a hyperbola centered at the origin: $Ax^2 - By^2 = C$
- ◇ Graphing a hyperbola given its equation in general form
- ◇ Finding the center, vertices, foci, and asymptotes of a hyperbola
- ◇ Finding the foci of a hyperbola given its equation in general form
- ◇ Writing an equation of a hyperbola given the foci and the vertices
- ◇ Writing an equation of a hyperbola given the foci and the asymptotes: Basic
- ◇ Writing an equation of a hyperbola given the foci and the asymptotes: Advanced
- ◇ Classifying conics given their equations
- ◇ Testing an equation for symmetry about the axes and origin
- ◇ 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
- ◇ Graphing a quadratic inequality: Problem type 1
- ◇ Graphing a quadratic inequality: Problem type 2
- ◇ Graphing an inequality involving a circle
- ◇ Graphing a system of nonlinear inequalities: Problem type 1
- ◇ Graphing a system of nonlinear inequalities: Problem type 2
- ◆ Sequences, Series, and Probability (116 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
- ◇ Interpreting a tree diagram
- ◇ Introduction to the counting principle
- ◇ Counting principle
- ◇ Factorial expressions
- ◇ Computing permutations and combinations
- ◇ Introduction to permutations and combinations
- ◇ Permutations and combinations: Problem type 1
- ◇ Permutations and combinations: Problem type 2
- ◇ Permutations and combinations: Problem type 3
- ◇ Binomial formula
- ◇ Interpreting a tally table
- ◇ Constructing a two-way frequency table: Basic
- ◇ Constructing a two-way frequency table: Advanced
- ◇ Computing a percentage from a table of values
- ◇ Making an inference using a two-way frequency table
- ◇ Calculating relative frequencies in a contingency table
- ◇ Calculating relative frequencies in a contingency table: Advanced
- ◇ Making a reasonable inference based on proportion statistics
- ◇ Finding if a question can be answered by the data
- ◇ 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
- ◇ Constructing a dot plot (line plot)
- ◇ Constructing a bar graph for non-numerical data
- ◇ Constructing a frequency distribution and a histogram
- ◇ Interpreting a bar graph
- ◇ Interpreting a double bar graph
- ◇ Interpreting a pictograph table
- ◇ Interpreting a stem-and-leaf plot
- ◇ Finding a percentage of a total amount in a circle graph
- ◇ Computations from a circle graph
- ◇ Interpreting a circle graph or pie chart
- ◇ Angle measure in a circle graph
- ◇ 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
- ◇ Introduction to the probability of an event
- ◇ Probability involving one die or choosing from n distinct objects
- ◇ Probability involving choosing from objects that are not distinct
- ◇ Understanding likelihood
- ◇ Finding the odds in favor and against
- ◇ Outcomes and event probability
- ◇ Probabilities of a permutation and a combination
- ◇ Area as probability
- ◇ Experimental and theoretical probability

- ◇ Introduction to expectation
- ◇ Probability of independent events: Decimal answers
- ◇ Probability of dependent events: Decimal answers
- ◇ Probabilities of draws with replacement
- ◇ Probabilities of draws without replacement
- ◇ 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
- ◇ Identifying outcomes in a random number table used to simulate a compound event
- ◇ Using a random number table to simulate a compound event
- ◇ Mode of a data set
- ◇ Finding the mode and range of a data set
- ◇ Finding the mode and range from a line plot
- ◇ Mean of a data set
- ◇ Using a model to find the mean
- ◇ Understanding the mean graphically: Two bars
- ◇ Understanding the mean graphically: Four or more bars
- ◇ Computations involving the mean, sample size, and sum of a data set
- ◇ Finding the value for a new score that will yield a given mean
- ◇ Rejecting unreasonable claims based on average statistics
- ◇ Weighted mean
- ◇ Mean and median of a data set
- ◇ How changing a value affects the mean and median
- ◇ Finding outliers in a data set
- ◇ Choosing the best measure to describe data
- ◇ Using back-to-back stem-and-leaf plots to compare data sets
- ◇ Percentiles
- ◇ Five-number summary and interquartile range
- ◇ Constructing a box-and-whisker plot
- ◇ Using box-and-whisker plots to compare data sets
- ◇ Computing mean absolute deviation from a list of numerical values
- ◇ Population standard deviation
- ◇ Word problem involving calculations from a normal distribution
- ◆ Polynomial and Rational Functions (6 topics)
 - ◇ Identifying polynomial functions
 - ◇ Remainder theorem: Advanced
 - ◇ 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
- ◆ 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 (105 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
- ◇ 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 $a_i + b_j$ form given its graph
- ◇ Writing a vector in $a_i + b_j$ 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 $a_i + b_j$ form
- ◇ Magnitude of a vector given in component form
- ◇ Vector addition and scalar multiplication: $a_i + b_j$ form
- ◇ Linear combination of vectors: $a_i + b_j$ 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 $a_i + b_j$ 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 $a_i + b_j$ 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 $a_i + b_j$ 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 n th roots of a number: Problem type 1
- ◇ Finding the n th roots of a number: Problem type 2
- ◇ 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
- ◇ 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.*