



Math Prep for College Physics

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

Curriculum (411 topics + 219 additional topics)

- Arithmetic (69 topics)
 - ◆ Integers (22 topics)
 - ◇ Order of operations with whole numbers
 - ◇ Order of operations with whole numbers and grouping symbols
 - ◇ Rounding to tens or hundreds
 - ◇ Rounding to thousands, ten thousands, or hundred thousands
 - ◇ Estimating a sum of whole numbers: Problem type 2
 - ◇ Estimating a difference of whole numbers: Problem type 2
 - ◇ Estimating a product or quotient of whole numbers
 - ◇ Comparing signed numbers relating to a real-world situation
 - ◇ Integer addition: Problem type 2
 - ◇ Integer subtraction: Problem type 3
 - ◇ Integer multiplication and division
 - ◇ Exponents and integers: Problem type 1
 - ◇ Exponents and integers: Problem type 2
 - ◇ Square root of a perfect square
 - ◇ Order of operations with integers
 - ◇ Order of operations with integers and exponents
 - ◇ Absolute value of a number
 - ◇ Operations with absolute value: Problem type 1
 - ◇ Evaluating a linear expression: Integer multiplication with addition or subtraction
 - ◇ Evaluating a quadratic expression: Integers
 - ◇ Additive property of equality with integers
 - ◇ Multiplicative property of equality with whole numbers
 - ◆ Introduction to Perimeter and Area (3 topics)
 - ◇ Perimeter of a square or a rectangle
 - ◇ Area of a square or a rectangle
 - ◇ Word problem involving the area of a rectangle: Problem type 2
 - ◆ Fractions (13 topics)
 - ◇ Equivalent fractions
 - ◇ Simplifying a fraction
 - ◇ Addition or subtraction of fractions with the same denominator
 - ◇ Addition or subtraction of fractions with different denominators
 - ◇ Signed fraction addition or subtraction: Basic
 - ◇ Product of a fraction and a whole number: Problem type 1
 - ◇ Introduction to fraction multiplication
 - ◇ Fraction multiplication
 - ◇ Determining if a quantity is increased or decreased when multiplied by a fraction
 - ◇ Signed fraction multiplication: Basic
 - ◇ Exponents and fractions

- ◇ Exponents and signed fractions
 - ◇ Fraction division
- ◆ Decimals and Percents (16 topics)
 - ◇ Rounding decimals
 - ◇ Signed decimal addition and subtraction
 - ◇ Multiplication of a decimal by a power of ten
 - ◇ Multiplication of a decimal by a power of 0.1
 - ◇ Division of a decimal by a power of ten
 - ◇ Division of a decimal by a power of 0.1
 - ◇ Evaluating a linear expression: Signed decimal addition and subtraction
 - ◇ Evaluating a linear expression: Signed decimal multiplication with addition or subtraction
 - ◇ Converting between percentages and decimals
 - ◇ Converting between percentages and decimals in a real–world situation
 - ◇ Converting a fraction to a percentage: Denominator of 20, 25, or 50
 - ◇ Writing a ratio as a percentage
 - ◇ Finding a percentage of a total amount: Real–world situations
 - ◇ Finding the final amount given the original amount and 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
- ◆ Unit Conversion (9 topics)
 - ◇ Choosing metric measurement units
 - ◇ Metric distance conversion with decimal values
 - ◇ Metric conversion with decimal values: Two–step problem
 - ◇ Metric area unit conversion with decimal values
 - ◇ Converting between metric units of volume and capacity
 - ◇ Converting between metric and U.S. Customary unit systems
 - ◇ Converting between compound units: Basic
 - ◇ Converting between compound units: Advanced
 - ◇ Word problem on area involving conversions between systems
- ◆ Properties of Real Numbers (6 topics)
 - ◇ Combining like terms: Integer coefficients
 - ◇ Distributive property: Whole number coefficients
 - ◇ Distributive property: Integer coefficients
 - ◇ Using distribution and combining like terms to simplify: Univariate
 - ◇ Using distribution with double negation and combining like terms to simplify: Multivariate
 - ◇ Introduction to the power of a product rule of exponents
- Linear Equations (38 topics)
 - ◆ Linear Equations (15 topics)
 - ◇ Additive property of equality with signed fractions
 - ◇ Additive property of equality with decimals
 - ◇ Additive property of equality with a negative coefficient
 - ◇ Multiplicative property of equality with signed fractions
 - ◇ Multiplicative property of equality with decimals
 - ◇ Solving a two–step equation with integers
 - ◇ Solving an equation to find the value of an expression
 - ◇ Solving a two–step equation with signed decimals
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and distribution
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
 - ◇ Solving a two–step equation with signed fractions

- ◇ Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
- ◇ Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
- ◇ Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
- ◆ Solving Formulas for a Variable (7 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
- ◆ Rates, Proportions, and Applications of Linear Equations (15 topics)
 - ◇ Writing a one–step expression for a real–world situation
 - ◇ Translating a sentence into a one–step equation
 - ◇ Word problem on unit rates associated with ratios of whole numbers: Decimal answers
 - ◇ Solving a word problem involving rates and time conversion
 - ◇ Solving a proportion of the form $x/a = b/c$
 - ◇ Solving a proportion of the form $(x+a)/b = c/d$
 - ◇ Word problem on proportions: Problem type 1
 - ◇ Word problem on proportions: Problem type 2
 - ◇ Writing an equation of the form $Ax + B = C$ to solve a word problem
 - ◇ Solving a decimal word problem using a linear equation of the form $Ax + B = C$
 - ◇ Writing an equation of the form $A(x + B) = C$ to solve a word problem
 - ◇ Solving a word problem with two unknowns using a linear equation
 - ◇ Writing an equation to represent a real–world problem: Variable on both sides
 - ◇ Writing and solving a real–world problem given an equation with the variable on both sides
 - ◇ Solving a distance, rate, time problem using a linear equation
- ◆ Absolute Value Equations (1 topics)
 - ◇ Introduction to solving an absolute value equation
- Geometry (34 topics)
 - ◆ Angles (8 topics)
 - ◇ Acute, obtuse, and right angles
 - ◇ Measuring an angle with the protractor
 - ◇ Finding the complement or supplement of an angle given a figure
 - ◇ Finding angle measures given two intersecting lines
 - ◇ Solving equations involving vertical angles and linear pairs
 - ◇ Finding angle measures given two parallel lines cut by a transversal
 - ◇ Solving equations involving angles and a pair of parallel lines
 - ◇ Solving equations involving angles and two pairs of parallel lines
 - ◆ Triangles (12 topics)
 - ◇ Acute, obtuse, and right triangles
 - ◇ Finding an angle measure of a triangle given two angles
 - ◇ Finding an angle measure for a triangle with an extended side
 - ◇ Finding side lengths and angle measures of isosceles and equilateral triangles
 - ◇ Finding an angle measure for a triangle sharing a side with another triangle
 - ◇ Finding angle measures of a triangle given angles with variables
 - ◇ Finding an angle measure given a triangle and parallel lines
 - ◇ Pythagorean Theorem
 - ◇ Word problem involving the Pythagorean Theorem
 - ◇ Finding a missing side length given two similar triangles

- ◇ Similar right triangles
 - ◇ Indirect measurement
- ◆ Polygons and Circles (6 topics)
 - ◇ Area of a piecewise rectangular figure
 - ◇ Finding side lengths of rectangles given one dimension and an area or a perimeter
 - ◇ Area of a triangle
 - ◇ Circumference of a circle
 - ◇ Circumference ratios
 - ◇ Circumference and area of a circle
- ◆ Solids (8 topics)
 - ◇ Surface area of a cube or a rectangular prism
 - ◇ Surface area of a cylinder
 - ◇ Surface area of a sphere
 - ◇ Volume of a rectangular prism
 - ◇ Volume of a cylinder
 - ◇ Volume of a sphere
 - ◇ Word problem involving the rate of filling or emptying a cylinder
 - ◇ Ratio of volumes
- Lines and Systems of Linear Equations (49 topics)
 - ◆ The Coordinate Plane, Distance, and Midpoint (4 topics)
 - ◇ Reading a point in the coordinate plane
 - ◇ Plotting a point in the coordinate plane
 - ◇ Finding a solution to a linear equation in two variables
 - ◇ Distance between two points in the plane: Decimal answers
 - ◆ Graphing and Intercepts (8 topics)
 - ◇ Graphing a linear equation of the form $y = mx$
 - ◇ Graphing a line given its equation in slope–intercept form: Integer slope
 - ◇ Graphing a line given its equation in slope–intercept form: Fractional slope
 - ◇ Graphing a line given its equation in standard form
 - ◇ Graphing a vertical or horizontal line
 - ◇ Finding x – and y –intercepts given the graph of a line on a grid
 - ◇ Finding x – and y –intercepts of a line given the equation: Basic
 - ◇ Graphing a line given its x – and y –intercepts
 - ◆ Slope (4 topics)
 - ◇ Finding slope given the graph of a line on a grid
 - ◇ Finding slope given two points on the line
 - ◇ Using right triangles to find the slope of a line
 - ◇ Graphing a line given its slope and y –intercept
 - ◆ Equations of Lines (7 topics)
 - ◇ Finding the slope and y –intercept of a line given its equation in the form $y = mx + b$
 - ◇ Finding the slope and y –intercept of a line given its equation in the form $Ax + By = C$
 - ◇ Writing an equation 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
 - ◇ Writing an equation in slope–intercept form given the slope and a point
 - ◇ Writing an equation of a line given the y –intercept and another point
 - ◇ Writing the equation of the line through two given points
 - ◆ Applications (7 topics)
 - ◇ Interpreting a line graph
 - ◇ Finding the intercepts and rate of change given a graph of a linear function
 - ◇ 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
 - ◇ Sketching the least–squares regression line
 - ◇ Scatter plots and correlation

- ◇ Approximating the equation of a line of best fit and making predictions
- ◆ Systems of Linear Equations (10 topics)
 - ◇ Identifying solutions to a system of linear equations
 - ◇ 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 decimal coefficients
 - ◇ Interpreting the graphs of two functions
 - ◇ Solving a percent mixture problem using a system of linear equations
 - ◇ Solving a distance, rate, time problem using a system of linear equations
- ◆ Introduction to Functions (9 topics)
 - ◇ Evaluating functions: Linear and quadratic or cubic
 - ◇ Finding where a function is increasing, decreasing, or constant given the graph
 - ◇ Choosing a graph to fit a narrative: Basic
 - ◇ Understanding distance and speed graphs
 - ◇ Graphing a function of the form $f(x) = ax + b$: Fractional slope
 - ◇ 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 $f(x) = ax^2 + c$
- Exponents, Polynomials, and Factoring (57 topics)
 - ◆ Integer Exponents (23 topics)
 - ◇ Introduction to the product rule of exponents
 - ◇ Product rule with positive exponents: Univariate
 - ◇ Product rule with positive exponents: Multivariate
 - ◇ Ordering numbers with positive exponents
 - ◇ Introduction to the power of a power rule of exponents
 - ◇ Power rules with positive exponents: Multivariate products
 - ◇ Power rules with positive exponents: Multivariate quotients
 - ◇ 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
 - ◇ 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
 - ◇ Ordering numbers 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, product, and quotient rules with negative exponents
 - ◆ Scientific Notation (14 topics)
 - ◇ Power of 10: Positive exponent
 - ◇ Scientific notation with positive exponent
 - ◇ Scientific notation with negative exponent
 - ◇ Converting between scientific notation and standard form in a real-world situation
 - ◇ Estimating numbers using scientific notation

- ◇ Choosing metric units and converting to the base unit in scientific notation
- ◇ Expressing calculator notation as scientific notation
- ◇ Multiplying numbers written in scientific notation: Advanced
- ◇ Multiplying numbers written in decimal form or scientific notation in a real–world situation
- ◇ Dividing numbers written in scientific notation: Advanced
- ◇ Adding or subtracting numbers written in scientific notation: Same exponents, basic
- ◇ Adding or subtracting numbers written in scientific notation: Different exponents
- ◇ Finding powers of numbers written in scientific notation
- ◇ Order of magnitude estimation
- ◆ Polynomial Expressions (9 topics)
 - ◇ Simplifying a sum or difference of two 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 binomials with leading coefficients of 1
 - ◇ Multiplying binomials with leading coefficients greater than 1
 - ◇ Multiplying binomials in two variables
 - ◇ Squaring a binomial: Univariate
 - ◇ Multiplying binomials with negative coefficients
- ◆ Factoring (7 topics)
 - ◇ Introduction to the GCF of two monomials
 - ◇ Factoring out a monomial from a polynomial: Univariate
 - ◇ Factoring a quadratic with leading coefficient 1
 - ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 1
 - ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 2
 - ◇ Factoring a perfect square trinomial with leading coefficient 1
 - ◇ Factoring a difference of squares in one variable: Basic
- ◆ Solving Quadratic Equations by Factoring (4 topics)
 - ◇ 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
- Rational Expressions (28 topics)
 - ◆ Rational Expressions (10 topics)
 - ◇ Restriction on a variable in a denominator: Linear
 - ◇ Multiplying rational expressions involving multivariate monomials
 - ◇ Dividing rational expressions involving multivariate monomials
 - ◇ Introduction to the LCM of two monomials
 - ◇ Adding rational expressions with common denominators and monomial numerators
 - ◇ Adding rational expressions with common denominators and binomial numerators
 - ◇ Adding rational expressions with denominators ax and bx : Basic
 - ◇ Adding rational expressions with denominators ax and bx : Advanced
 - ◇ Adding rational expressions with linear denominators without common factors: Basic
 - ◇ Adding rational expressions with linear denominators without common factors: Advanced
 - ◆ Complex Fractions (2 topics)
 - ◇ Complex fraction without variables: Problem type 1
 - ◇ Complex fraction involving univariate monomials
 - ◆ Rational Equations (9 topics)
 - ◇ Solving a rational equation that simplifies to linear: Denominator x
 - ◇ Solving a rational equation that simplifies to linear: Denominator $x+a$
 - ◇ Solving a rational equation that simplifies to linear: Denominators a , x , or ax
 - ◇ Solving a rational equation that simplifies to linear: Denominators ax and bx
 - ◇ Solving 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 involving multiple rates
- ◇ Solving a work problem using a rational equation
- ◆ Direct and Inverse Variation (7 topics)
 - ◇ Identifying direct variation equations
 - ◇ Word problem on direct variation
 - ◇ Identifying direct and inverse variation equations
 - ◇ Word problem on inverse variation
 - ◇ Word problem on inverse proportions
 - ◇ Writing an equation that models variation
 - ◇ Word problem on combined variation
- Radicals (38 topics)
 - ◆ Radical Expressions (19 topics)
 - ◇ Simplifying the square root of a whole number less than 100
 - ◇ Introduction to simplifying a radical expression with an even exponent
 - ◇ Square root of a perfect square monomial
 - ◇ 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
 - ◇ Square root multiplication: Basic
 - ◇ Square root multiplication: Advanced
 - ◇ Introduction to simplifying a product of radical expressions: Univariate
 - ◇ Simplifying a product of radical expressions: Univariate
 - ◇ Simplifying a product of radical expressions: Multivariate
 - ◇ Introduction to simplifying a product of higher roots
 - ◇ Simplifying a product of higher radical expressions
 - ◇ Simplifying a quotient of square roots
 - ◆ Rational Exponents (11 topics)
 - ◇ Converting between radical form and exponent form
 - ◇ Rational exponents: Unit fraction exponents and whole number bases
 - ◇ Rational exponents: Non–unit fraction exponent with a whole number base
 - ◇ Rational exponents: Negative exponents and fractional bases
 - ◇ 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 products or quotients of higher radicals with different indices: Univariate
 - ◇ Simplifying products or quotients of higher radicals with different indices: Multivariate
 - ◆ Radical Equations (8 topics)
 - ◇ Solving a radical equation that simplifies to a linear equation: One radical, basic
 - ◇ 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
 - ◇ Algebraic symbol manipulation with 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 exponent $1/a$: Problem type 1
- Quadratic Functions (13 topics)
 - ◆ Quadratic Equations (5 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
 - ◇ Applying the quadratic formula: Exact answers
 - ◇ Applying the quadratic formula: Decimal answers
 - ◇ Solving a word problem using a quadratic equation with irrational roots
 - ◆ Quadratic Functions (5 topics)
 - ◇ Graphing a parabola of the form $y = (x-h)^2 + k$
 - ◇ Graphing a parabola of the form $y = a(x-h)^2 + k$
 - ◇ Graphing a parabola of the form $y = x^2 + bx + c$
 - ◇ Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
 - ◇ Finding the zeros of a quadratic function given its equation
 - ◆ Conic Sections (3 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 $ax^2 + bx + cy + d = 0$
- Function Operations (4 topics)
 - ◆ Transformations of Graphs (3 topics)
 - ◇ Translating the graph of a parabola: One step
 - ◇ Translating the graph of a parabola: Two steps
 - ◇ Translating the graph of a function: One step
 - ◆ Function Operations (1 topics)
 - ◇ Introduction to the composition of two functions
- Exponential and Logarithmic Functions (21 topics)
 - ◆ Exponential Functions (6 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 $f(x)=-b^{ax}$
 - ◇ Evaluating an exponential function with base e that models a real-world situation
 - ◇ Finding a final amount in a word problem on exponential growth or decay
 - ◆ Logarithmic Functions (8 topics)
 - ◇ Converting between logarithmic and exponential equations
 - ◇ Converting between natural logarithmic and exponential equations
 - ◇ Evaluating logarithmic expressions
 - ◇ Solving an equation of the form $\log_b a = c$
 - ◇ Basic properties of logarithms
 - ◇ Using properties of logarithms to evaluate expressions
 - ◇ Expanding a logarithmic expression: Problem type 2
 - ◇ Change of base for logarithms: Problem type 1
 - ◆ Exponential and Logarithmic Equations and Applications (7 topics)
 - ◇ Solving a multi-step equation involving natural logarithms
 - ◇ Solving an exponential equation by using natural logarithms: Decimal answers
 - ◇ Finding the time given an exponential function with base e that models a real-world situation
 - ◇ Finding the final amount in a word problem on continuous compound interest
 - ◇ Finding the final amount in a word problem on continuous exponential growth or decay
 - ◇ Finding the rate or time in a word problem on continuous exponential growth or decay
 - ◇ Finding half-life or doubling time
- Trigonometric Functions (40 topics)
 - ◆ Radians and Unit Circle Trigonometry (11 topics)
 - ◇ Converting between degree and radian measure: Problem type 1

- ◇ Converting between degree and radian measure: Problem type 2
- ◇ Sketching an angle in standard position
- ◇ Arc length and central angle measure
- ◇ Angular and linear speed
- ◇ Common angles and trigonometric functions
- ◇ Trigonometric functions and special angles: Problem type 1
- ◇ Trigonometric functions and special angles: Problem type 2
- ◇ Evaluating expressions involving sine and cosine
- ◇ 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: Numbers for side lengths
 - ◇ Using the Pythagorean Theorem to find a trigonometric ratio
 - ◇ Understanding trigonometric ratios through similar right triangles
 - ◇ Relationship between the sines and cosines of complementary angles
 - ◇ Using a trigonometric ratio to find a side length in a right triangle
 - ◇ Using trigonometry to find a length in a word problem with one right triangle
 - ◇ Using a trigonometric ratio to find an angle measure in a right triangle
 - ◇ Using trigonometry to find angles of elevation or depression in a word problem
 - ◇ Solving a right triangle
 - ◇ Using trigonometry to find a length in a word problem with two right triangles
- ◆ Trigonometric Functions of Angles (1 topics)
 - ◇ Finding values of trigonometric functions given information about an angle: Problem type 2
- ◆ Graphs of Sine and Cosine Functions (12 topics)
 - ◇ Sketching the graph of $y = a \sin(x)$ or $y = a \cos(x)$
 - ◇ Sketching the graph of $y = \sin(bx)$ or $y = \cos(bx)$
 - ◇ Sketching the graph of $y = \sin(x) + d$ or $y = \cos(x) + d$
 - ◇ Sketching the graph of $y = \sin(x+c)$ or $y = \cos(x+c)$
 - ◇ Sketching the graph of $y = a \sin(x+c)$ or $y = a \cos(x+c)$
 - ◇ Sketching the graph of $y = a \sin(bx)$ or $y = a \cos(bx)$
 - ◇ Sketching the graph of $y = a \sin(bx+c)$ or $y = a \cos(bx+c)$
 - ◇ Sketching the graph of $y = a \sin(bx) + d$ or $y = a \cos(bx) + d$
 - ◇ Amplitude and period of sine and cosine functions
 - ◇ Amplitude, period, and phase shift of sine and cosine functions
 - ◇ Writing the equation of a sine or cosine function given its graph: Problem type 1
 - ◇ Writing the equation of a sine or cosine function given its graph: Problem type 2
- ◆ Inverse Trigonometric Functions (6 topics)
 - ◇ Values of inverse trigonometric functions
 - ◇ 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 Equations and Vectors (20 topics)
 - ◆ Vectors (18 topics)
 - ◇ 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: $ai+bj$ form
- ◇ Linear combination of vectors: $ai+bj$ form
- ◇ Multiplication of a vector by a scalar: Geometric approach
- ◇ Vector addition: Geometric approach
- ◇ Vector subtraction: Geometric approach
- ◇ Finding the magnitude and direction of a vector given its graph
- ◇ Finding the components of a vector given its graph
- ◇ Finding the direction angle of a vector given in $ai+bj$ form
- ◇ Writing a vector given its magnitude and direction angle
- ◇ Writing a vector to represent a force pushing or pulling an object
- ◇ Finding the magnitude and direction angle of the resultant force of two vectors
- ◇ Finding magnitudes of forces related to a sum of three vectors
- ◇ Finding magnitudes of forces related to an object suspended by cables
- ◆ The Dot Product (2 topics)
 - ◇ Dot product of vectors given in $ai+bj$ form
 - ◇ Finding the component of a vector along another vector
- Other Topics Available(*) (219 additional topics)
 - ◆ Arithmetic (26 topics)
 - ◇ Plotting integers on a number line
 - ◇ Ordering integers
 - ◇ Operations with absolute value: Problem type 2
 - ◇ Additive property of equality with whole numbers
 - ◇ Perimeter of a polygon
 - ◇ Constructing a bar graph for non–numerical data
 - ◇ Interpreting a bar graph
 - ◇ Constructing a histogram for numerical data
 - ◇ Signed fraction addition or subtraction: Advanced
 - ◇ Signed fraction multiplication: Advanced
 - ◇ Signed fraction division
 - ◇ Writing an improper fraction as a mixed number
 - ◇ Writing a mixed number as an improper fraction
 - ◇ Decimal place value: Hundreds to ten thousandths
 - ◇ Converting a fraction to a terminating decimal: Basic
 - ◇ Converting a fraction to a repeating decimal: Basic
 - ◇ Converting a mixed number to a terminating decimal: Basic
 - ◇ Converting a decimal to a proper fraction in simplest form: Advanced
 - ◇ Finding a percentage of a whole number without a calculator: Basic
 - ◇ Finding the multiplier to give a final amount after a percentage increase or decrease
 - ◇ Finding the percentage increase or decrease: Basic
 - ◇ Finding the absolute error and percent error of a measurement
 - ◇ Computing a percent mixture
 - ◇ Mean of a data set
 - ◇ Weighted mean: Tabular data
 - ◇ Converting between temperatures in Fahrenheit and Celsius
 - ◆ Linear Equations (11 topics)
 - ◇ Solving a proportion of the form $a/(x+b) = c/x$
 - ◇ Writing a multi–step equation for a real–world situation
 - ◇ Solving a decimal word problem using a linear equation with the variable on both sides
 - ◇ Solving a fraction word problem using a linear equation with the variable on both sides
 - ◇ Solving a word problem with three unknowns using a linear equation
 - ◇ Solving a word problem involving consecutive integers

- ◇ 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 $|ax+b| = |cx+d|$
- ◆ Geometry (27 topics)
 - ◇ Drawing an angle with the protractor
 - ◇ Finding supplementary and complementary angles
 - ◇ Finding angle measures of an isosceles triangle given angles with variables
 - ◇ Finding an angle measure given extended triangles
 - ◇ Using the Pythagorean Theorem repeatedly
 - ◇ Triangles and parallel lines
 - ◇ Identifying similar right triangles that overlap
 - ◇ Special right triangles: Decimal answers
 - ◇ 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
 - ◇ Area between two rectangles
 - ◇ Word problem involving the area between two rectangles
 - ◇ Finding lengths using scale models
 - ◇ Using a scale drawing to find actual area
 - ◇ Area of a parallelogram
 - ◇ Finding measures involving diagonals of parallelograms
 - ◇ Finding measures involving diagonals of rectangles
 - ◇ Perimeter involving rectangles and circles
 - ◇ Area involving rectangles and circles
 - ◇ Area between two concentric circles
 - ◇ Word problem involving the area between two concentric circles
 - ◇ Arc length
 - ◇ Area of a sector of a circle: Exact answer in terms of pi
 - ◇ Arc length and area of a sector of a circle
 - ◇ Identifying solids generated by rotations of two-dimensional regions
 - ◇ Volume of an oblique rectangular prism
 - ◇ Computing ratios of side lengths, surface areas, and volumes for similar solids
- ◆ Lines and Systems of Linear Equations (38 topics)
 - ◇ Distance between two points in the plane: Exact answers
 - ◇ Midpoint of a line segment in the plane
 - ◇ Finding x- and y-intercepts of a line given the equation: Advanced
 - ◇ X- and y-intercepts of a line given the equation in standard form
 - ◇ Graphing a linear inequality in the plane: Standard form
 - ◇ Graphing a linear inequality in the plane: Vertical or horizontal line
 - ◇ Finding the slope of horizontal and vertical lines
 - ◇ Finding the coordinate that yields a given slope
 - ◇ Graphing a line through a given point with a given slope
 - ◇ Writing an equation of a line given its slope and y-intercept
 - ◇ Finding the slope and a point on a line given its equation in point-slope form
 - ◇ Graphing a line given its equation in point-slope form
 - ◇ Writing an equation in point-slope form given the slope and a point
 - ◇ Writing an equation in standard form given the slope and a point
 - ◇ Writing the equations of vertical and horizontal lines through a given point
 - ◇ Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
 - ◇ Comparing properties of linear functions given in different forms
 - ◇ Finding the coordinates of a point to make a parallelogram
 - ◇ Solving a linear equation by graphing

- ◇ Identifying proportional relationships in tables by calculating unit rates: Whole numbers
- ◇ Identifying proportional relationships in graphs: Basic
- ◇ Identifying proportional relationships in graphs: Advanced
- ◇ Comparing proportional relationships given in different forms
- ◇ Constructing a scatter plot
- ◇ Predictions from the line of best fit
- ◇ Classifying linear and nonlinear relationships from scatter plots
- ◇ Linear relationship and the sample correlation coefficient
- ◇ Solving a word problem using a system of linear equations of the form $Ax + By = C$
- ◇ Solving a word problem using a system of linear equations of the form $y = mx + b$
- ◇ 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
- ◇ Graphing a system of two linear inequalities: Basic
- ◇ Finding an output of a function from its 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
- ◆ Exponents, Polynomials, and Factoring (18 topics)
 - ◇ Power and product rules with positive exponents
 - ◇ Power and quotient rules with negative exponents: Problem type 1
 - ◇ Power and quotient rules with negative exponents: Problem type 2
 - ◇ Power of 10: Negative exponent
 - ◇ Finding the scale factor between numbers given in scientific notation in a real-world situation
 - ◇ Adding or subtracting numbers written in scientific notation: Same exponents, advanced
 - ◇ Simplifying a sum or difference of three univariate polynomials
 - ◇ Multiplying a multivariate polynomial by a monomial
 - ◇ Squaring a binomial: Multivariate
 - ◇ Multiplication involving binomials and trinomials in one variable
 - ◇ Multiplication involving binomials and trinomials in two variables
 - ◇ Greatest common factor of two multivariate monomials
 - ◇ Factoring a univariate polynomial by grouping: Problem type 1
 - ◇ Factoring a univariate polynomial by grouping: Problem type 2
 - ◇ Factoring out a constant before factoring a quadratic
 - ◇ Factoring a quadratic with a negative leading coefficient
 - ◇ Factoring a difference of squares in one variable: Advanced
 - ◇ Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
- ◆ Rational Expressions (19 topics)
 - ◇ Restriction on a variable in a denominator: Quadratic
 - ◇ Simplifying a ratio of polynomials: Problem type 1
 - ◇ Least common multiple of two monomials
 - ◇ Adding rational expressions with multivariate monomial denominators: Advanced
 - ◇ Complex fraction without variables: Problem type 2
 - ◇ 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 that contains a complex fraction
 - ◇ Solving a rational equation that simplifies to linear: Unlike binomial denominators
 - ◇ 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 and numerators
- ◇ Solving a distance, rate, time problem using a rational equation
- ◇ Writing a direct variation equation
- ◇ Writing an inverse variation equation
- ◆ Radicals (14 topics)
 - ◇ Introduction to square root addition or subtraction
 - ◇ Introduction to simplifying a sum or difference of radical expressions: Univariate
 - ◇ Simplifying a sum or difference of radical expressions: Univariate
 - ◇ Simplifying a sum or difference of radical expressions: Multivariate
 - ◇ Simplifying a product of radical expressions: Multivariate, fractional expressions
 - ◇ Introduction to simplifying a product involving square roots using the distributive property
 - ◇ Simplifying a product involving square roots using the distributive property: Advanced
 - ◇ Rationalizing a denominator: Quotient involving square roots
 - ◇ Rationalizing a denominator: Square root of a fraction
 - ◇ Solving a radical equation that simplifies to a linear equation: One radical, advanced
 - ◇ 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 an equation with a root index greater than 2: Problem type 2
 - ◇ Solving an equation with exponent $1/a$: Problem type 2
- ◆ Quadratic Functions (13 topics)
 - ◇ Discriminant of a quadratic equation
 - ◇ Solving an equation using the odd–root property: Problem type 1
 - ◇ Finding the x–intercept(s) and the vertex of a parabola
 - ◇ 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
 - ◇ Writing the equation of a quadratic function given its graph
 - ◇ Solving a quadratic equation by graphing
 - ◇ Graphing an ellipse given its equation in standard form
 - ◇ Graphing an ellipse centered at the origin: $Ax^2 + By^2 = C$
 - ◇ Graphing a hyperbola given its equation in standard form
 - ◇ Graphing a hyperbola centered at the origin: $Ax^2 + By^2 = C$
- ◆ Function Operations (9 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
 - ◇ 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 quadratic, cubic, square root, or absolute value function
 - ◇ Sum, difference, and product of two functions
 - ◇ Quotient of two functions: Basic
- ◆ Exponential and Logarithmic Functions (12 topics)
 - ◇ Graphing an exponential function and its asymptote: $f(x) = a(e)^{x-b} + c$
 - ◇ Finding the initial amount and rate of change given an exponential function
 - ◇ Graphing a logarithmic function: Basic
 - ◇ Graphing a logarithmic function: Advanced
 - ◇ Change of base for logarithms: Problem type 2
 - ◇ Solving a multi–step equation involving a single logarithm: Problem type 1
 - ◇ Solving a multi–step equation involving a single logarithm: Problem type 2
 - ◇ Solving an exponential equation by using logarithms: Decimal answers, basic

- ◇ Solving an exponential equation by using logarithms: Decimal answers, advanced
- ◇ Finding the time to reach a limit in a word problem on exponential growth or decay
- ◇ Writing and evaluating a function modeling continuous exponential growth or decay given doubling time or half-life
- ◇ Writing and evaluating a function modeling continuous exponential growth or decay given two outputs
- ◆ Trigonometric Functions (9 topics)
 - ◇ Area of a sector of a circle
 - ◇ Sine, cosine, and tangent ratios: Variables for side lengths
 - ◇ Using similar right triangles to find trigonometric ratios
 - ◇ Reference angles: Problem type 1
 - ◇ Word problem involving a sine or cosine function: Problem type 1
 - ◇ Sketching a graph of a damped sine or cosine function
 - ◇ 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 trigonometric functions with variable expressions as inputs: Problem type 2
- ◆ Trigonometric Equations and Vectors (23 topics)
 - ◇ Finding solutions in an interval for a basic equation involving sine or cosine
 - ◇ Finding solutions in an interval for a basic tangent, cotangent, secant, or cosecant equation
 - ◇ Solving a basic trigonometric equation using a calculator
 - ◇ Solving a trigonometric equation modeling a real-world situation
 - ◇ Solving a triangle with the law of sines: Problem type 1
 - ◇ Solving a triangle with the law of sines: Problem type 2
 - ◇ Solving a word problem using the law of sines
 - ◇ Solving a triangle with the law of cosines
 - ◇ Solving a word problem using the law of cosines
 - ◇ Using trigonometry to find the area of a right triangle
 - ◇ Finding the area of a triangle using trigonometry
 - ◇ Expressing the area of a triangle in terms of the sine of one of its angles
 - ◇ Translation of a vector
 - ◇ Vector addition and scalar multiplication: Component form
 - ◇ Linear combination of vectors: Component form
 - ◇ Unit vectors
 - ◇ 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
 - ◇ 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

***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.*