

Integrated Mathematics I

This course covers the topics shown below, **new topics** have been highlighted.
Students navigate learning paths based on their level of readiness.
Institutional users may customize the scope and sequence to meet curricular needs.

Curriculum (457 topics + 831 additional topics)

- Arithmetic Readiness (37 topics)
 - Factors, Multiples, and Equivalent Fractions (3 topics)
 - Equivalent fractions
 - Simplifying a fraction
 - Division involving zero
 - Addition and Subtraction with Fractions (2 topics)
 - Introduction to addition or subtraction of fractions with different denominators
 - Addition or subtraction of fractions with different denominators
 - Multiplication and Division with Fractions (5 topics)
 - Product of a unit fraction and a whole number
 - Product of a fraction and a whole number: Problem type 1
 - Introduction to fraction multiplication
 - Fraction multiplication
 - Product of a fraction and a whole number: Problem type 2
 - Rounding, Ordering, and the Number Line (4 topics)
 - Rounding to tens or hundreds
 - Rounding to hundreds or thousands
 - Decimal place value: Tenths and hundredths
 - Rounding decimals
 - Addition and Subtraction with Decimals (1 topics)
 - Decimal subtraction: Basic
 - Multiplication and Division with Decimals (5 topics)
 - Multiplication of a decimal by a power of ten
 - Multiplying a decimal by a whole number
 - Word problem with multiple decimal operations: Problem type 1
 - Division of a decimal by a power of ten
 - Division of a decimal by a whole number
 - Converting Between Fractions and Decimals (1 topics)
 - Converting a fraction to a terminating decimal: Basic
 - Ratios and Unit Rates (3 topics)
 - Finding missing values in a table of equivalent ratios
 - Using a table of equivalent ratios to find a missing quantity in a ratio
 - Solving a word problem on proportions using a unit rate
 - Percents (8 topics)
 - Introduction to converting a percentage to a decimal
 - Introduction to converting a decimal to a percentage
 - Converting between percentages and decimals
 - Converting a fraction to a percentage: Denominator of 4, 5, or 10
 - Converting a fraction to a percentage: Denominator of 20, 25, or 50
 - Converting a fraction to a percentage in a real-world situation
 - Finding a percentage of a whole number
 - Finding a percentage of a whole number without a calculator: Basic
 - Units of Measurement (5 topics)
 - U.S. Customary length conversion with whole number values
 - U.S. Customary volume conversion with whole number values
 - U.S. Customary weight conversions with whole number values
 - Time unit conversion with whole number values
 - Converting between metric and U.S. Customary unit systems
- Real Numbers (47 topics)
 - Plotting and Ordering (7 topics)

- Plotting integers on a number line
- Ordering integers
- Writing a signed number for a real-world situation
- Finding opposites of integers
- Square root of a perfect square
- Absolute value of a number
- Finding all numbers with a given absolute value
- Operations with Signed Numbers (13 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
 - Operations with absolute value: Problem type 1
 - Computing the distance between two integers on a number line
 - Integer multiplication and division
 - Multiplication of 3 or 4 integers
 - Signed fraction addition or subtraction: Basic
 - Signed fraction multiplication: Basic
 - Signed decimal addition and subtraction
- Exponents and Order of Operations (7 topics)
 - Introduction to exponents
 - Order of operations with whole numbers
 - Order of operations with whole numbers and exponents: Basic
 - Exponents and fractions
 - Exponents and integers: Problem type 1
 - Exponents and signed fractions
 - Order of operations with integers
- Evaluating Expressions (5 topics)
 - Evaluating an algebraic expression: Whole numbers with two operations
 - Evaluating a formula
 - Evaluating an algebraic expression: Whole numbers with one operation and an exponent
 - Evaluating a linear expression: Integer multiplication with addition or subtraction
 - Evaluating a quadratic expression: Integers
- Properties of Real Numbers (12 topics)
 - Combining like terms: Whole number coefficients
 - Combining like terms: Integer coefficients
 - Combining like terms: Fractional coefficients
 - Combining like terms: Decimal coefficients
 - Multiplying a constant and a linear monomial
 - Distributive property: Whole number coefficients
 - Distributive property: Integer coefficients
 - Distributive property: Fractional coefficients
 - Identifying parts in an algebraic expression
 - Identifying equivalent algebraic expressions
 - Using distribution and combining like terms to simplify: Univariate
 - Combining like terms in a quadratic expression
- Introduction to Perimeter and Area (3 topics)
 - Perimeter of a polygon
 - Perimeter of a square or a rectangle
 - Area of a square or a rectangle
- Linear Equations and Inequalities (91 topics)
 - One-Step Linear Equations (11 topics)
 - Identifying solutions to a one-step linear equation: Problem type 1
 - Identifying solutions to a one-step linear equation: Problem type 2
 - Additive property of equality with whole numbers
 - 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
 - Multi-Step Linear Equations (14 topics)

- Identifying solutions to a linear equation in one variable: Two-step equations
- Using two steps to solve an equation with whole numbers
- Additive property of equality with a negative coefficient
- Solving a two-step equation with integers
- Introduction to using substitution to solve a linear equation
- Introduction to solving an equation with parentheses
- Identifying properties used to solve a linear equation
- Introduction to solving an equation with variables on the same side
- Solving a linear equation with several occurrences of the variable: Variables on the same side
- Introduction to solving a linear equation with a variable on each 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 two-step equation with signed fractions
- Writing Expressions and Equations (6 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
 - Writing an equation to represent a proportional relationship
 - Translating a sentence into a multi-step equation
- Applications Involving Linear Equations (6 topics)
 - Writing and solving a one-step equation with decimals that models a real-world situation
 - 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 $Ax + B = C$
 - Solving a word problem with two unknowns using a linear equation
 - Writing an equation to represent a real-world problem: Variable on both sides
 - Solving a one-step word problem using the formula $d = rt$
- Solving for a Variable and Dimensional Analysis (5 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 multiplication or division: Basic
 - Solving for a variable in terms of other variables using addition or subtraction with division
 - U.S. Customary length conversions involving dimensional analysis
 - Converting between compound units: Basic
- Proportions and Applications Involving Percents (13 topics)
 - Solving a proportion of the form $x/a=b/c$: Basic
 - Solving a proportion of the form $x/a = b/c$
 - Writing a proportion to solve a problem involving rates
 - Writing and solving a proportion to convert between metric and U.S. Customary units
 - Word problem on proportions: Problem type 1
 - Applying the percent equation: Problem type 1
 - Writing a proportion to solve a multi-step problem involving percentages
 - Finding the multiplier to give a final amount after a percentage increase or decrease
 - 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 percentage increase or decrease: Advanced
 - Finding the absolute error and percent error of a measurement
 - Introduction to compound interest
- Absolute Value Equations (4 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
- Writing and Graphing Inequalities (6 topics)
 - Translating a sentence by using an inequality symbol
 - Translating a sentence into a one-step inequality
 - Introduction to identifying solutions to an inequality
 - Writing an inequality for a real-world situation
 - Graphing a linear inequality on the number line
 - Writing an inequality given a graph on the number line
- One-Step Linear Inequalities (6 topics)
 - Identifying solutions to a one-step linear inequality
 - Additive property of inequality with whole numbers
 - Additive property of inequality with integers
 - Multiplicative property of inequality with whole numbers
 - Multiplicative property of inequality with integers
 - Multiplicative property of inequality with signed fractions

- Multi-Step Linear Inequalities (7 topics)
 - Identifying solutions to a two-step linear inequality in one variable
 - Solving a two-step linear inequality with whole numbers
 - 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
- Applications Involving Linear Inequalities (5 topics)
 - Writing, solving, and graphing the solution to a one-step inequality that models a real-world situation
 - Solving a word problem using a one-step linear inequality
 - Solving a word problem using a two-step linear inequality
 - Solving a decimal word problem using a two-step linear inequality
 - Solving a decimal word problem using a linear inequality with the variable on both sides
- Compound Inequalities (4 topics)
 - Translating a sentence into a compound inequality
 - Graphing a compound inequality on the number line
 - Solving a compound linear inequality: Graph solution, basic
 - Solving and graphing the solution to a compound inequality that models a real-world situation
- Absolute Value Inequalities (4 topics)
 - Solving an absolute value inequality: Problem type 1
 - Solving an absolute value inequality: Problem type 3
 - Solving an absolute value inequality: Problem type 4
 - Writing and solving an absolute value inequality that models a real-world situation and interpreting the solution
- The Coordinate Plane and Equations of Lines (68 topics)
 - Ordered Pairs (4 topics)
 - Reading a point in the coordinate plane
 - Plotting a point in the coordinate plane
 - Finding distances between points that share a common coordinate given the graph
 - Finding distances between points that share a common coordinate given their coordinates
 - Tables and Graphs of Lines (15 topics)
 - Function tables with two-step rules
 - Table for a linear equation
 - Writing a function rule given a table of ordered pairs: One-step rules
 - Identifying solutions to a linear equation in two variables
 - Finding the coordinates of a point on a graph given the equation
 - Finding a solution to a linear equation in two variables
 - Graphing a linear equation of the form $y = mx$
 - Graphing a line given its equation in slope-intercept form: Integer slope
 - Graphing a line given its equation in slope-intercept form: Fractional slope
 - Graphing a line given its equation in standard form
 - Graphing a vertical or horizontal line
 - Finding x- and y-intercepts given the graph of a line on a grid
 - Finding x- and y-intercepts of a line given the equation: Basic
 - Graphing a line by first finding its x- and y-intercepts
 - Interpreting a line graph
 - Slope (7 topics)
 - Finding slope given the graph of a line in quadrant 1 that models a real-world situation
 - 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 (18 topics)
 - Identifying linear functions given ordered pairs
 - 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
 - Finding the slope and y-intercept given a table for a linear function
 - 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 the equation of a line given the y-intercept and another point
 - Writing the equation of a line through two given points
 - Comparing linear functions to the parent function $y = x$

- Identifying parallel and perpendicular lines
- Writing the equation and finding the slope of a line parallel or perpendicular to a vertical or horizontal line
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
- Identifying parallel and perpendicular lines from equations
- Writing equations of lines parallel and perpendicular to a given line through a point
- Identifying parallel and perpendicular lines from coordinates
- Applications of Linear Equations with Two Variables (14 topics)
 - Finding outputs of a one-step function that models a real-world situation: Two variable equation
 - Finding outputs of a two-step function with decimals that models a real-world situation: Two variable equation
 - Writing and evaluating a function that models a real-world situation: Basic
 - Writing a linear equation that models a real-world situation given a graph or a table of values
 - Writing an equation and drawing its graph to model a real-world situation: Advanced
 - Finding the intercepts and rate of change given a graph of a linear function
 - Finding the initial amount and rate of change given a table for a linear function
 - Finding the initial amount and rate of change given two points for a linear function
 - Combining functions to write a new function that models a real-world situation
 - Comparing properties of linear functions given in different forms
 - Interpreting the parameters of a linear function that models a real-world situation
 - Application problem with a linear function: Finding a coordinate given the slope and a point
 - Application problem with a linear function: Finding a coordinate given two points
 - Solving a linear equation by graphing
- Scatter Plots and Lines of Best Fit (10 topics)
 - 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
 - [Using technology to fit a linear regression model to data and to make a prediction](#) NEW
 - Computing residuals
 - Interpreting residual plots
 - Linear relationship and the correlation coefficient
 - Identifying correlation and causation
- Functions and Systems (56 topics)
 - Introduction to Functions (7 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
 - Finding outputs of a two-step function with decimals that models a real-world situation: Function notation
 - Domain and range of a linear function that models a real-world situation
 - Arithmetic Sequences (9 topics)
 - Finding the first terms of an arithmetic sequence using an explicit rule
 - Finding the next terms of an arithmetic sequence with whole numbers
 - 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
 - Writing an explicit rule for an arithmetic sequence
 - Writing a recursive rule for an arithmetic sequence
 - Graphs of Functions (11 topics)
 - Finding an output of a function from its graph
 - Finding and interpreting an output of a linear function given a graph that models a real-world situation
 - Finding domain and range from a linear graph in context
 - Interpreting the domain and range of a linear function in context
 - Finding where a function is increasing, decreasing, or constant given the graph
 - Choosing a graph to fit a narrative: Basic
 - Choosing a graph to fit a narrative: Advanced
 - Drawing a graph to fit a narrative
 - Determining if a function is linear given its graph
 - Graphing a parabola of the form $y = ax^2$
 - Finding the average rate of change of a function given its graph
 - Systems of Linear Equations (13 topics)
 - Identifying solutions to a system of linear equations
 - Identifying the solution of systems of linear equations from graphs

- Graphically solving a system of linear equations both of the form $y=mx+b$
- Graphing a system of linear equations and estimating a solution
- 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 systems of linear equations with 0, 1, or infinitely many solutions
- Identifying the operations used to create equivalent systems of equations
- Applications Involving Systems of Linear Equations (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 $Ax + By = C$
 - Writing and solving a system of two linear equations given a table of values
 - Solving a word problem using a system of linear equations of the form $y = mx + b$
 - Solving a value mixture problem using a system of linear equations
 - Solving a distance, rate, time problem using a system of linear equations
- Linear Inequalities with Two Variables (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 (5 topics)
 - Graphing a system of two linear inequalities: Basic
 - Graphing a system of two linear inequalities: Advanced
 - Writing a linear inequality in two variables given a table of values
 - Writing a multi-step inequality for a real-world situation
 - Writing a system of linear inequalities that models a real-world situation and determining possible solutions
- Exponents and Exponential Functions (35 topics)
 - Product, Power, and Quotient Rules (4 topics)
 - Introduction to the product rule of exponents
 - Introduction to the power of a power rule of exponents
 - Simplifying a ratio of multivariate monomials: Basic
 - Introduction to the quotient rule of exponents
 - Negative Exponents (5 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
 - Power of a power rule with negative exponents
 - Introduction to Radicals (1 topics)
 - Introduction to square root addition or subtraction
 - Graphs of Exponential Functions (6 topics)
 - Table for an exponential function
 - Graphing an exponential function: $f(x) = b^x$
 - Graphing an exponential function: $f(x) = a(b)^x$
 - Translating the graph of an exponential function
 - Finding domain and range from the graph of an exponential function
 - Choosing the graph for an exponential function and identifying key features
 - Applications of Exponential Functions (10 topics)
 - Using a calculator to evaluate exponential expressions
 - Evaluating an exponential function that models a real-world situation
 - Finding a final amount in a word problem on exponential growth or decay
 - 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
 - Using technology to determine the better regression model for a given data set and using that model to make a prediction: Linear and exponential
 - (NEW) Solving an exponential equation by finding common bases: Linear exponents
 - Comparing linear, polynomial, and exponential functions

- Geometric Sequences (9 topics)
 - Finding the first terms of a geometric sequence using an explicit rule
 - Finding the next terms of a geometric sequence with whole numbers
 - Finding the next terms of a geometric sequence with signed numbers
 - 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
 - Arithmetic and geometric sequences: Identifying and writing an explicit rule
 - Writing recursive rules for arithmetic and geometric sequences
 - Identifying linear, quadratic, and exponential functions given ordered pairs
- Data Analysis (24 topics)
 - Frequency Tables (6 topics)
 - 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
 - Graphs of Data (5 topics)
 - Constructing a line plot
 - Constructing a frequency distribution and a histogram
 - Interpreting a histogram
 - Measuring an angle with the protractor
 - Interpreting a Venn diagram of 2 sets
 - Measures of Center and Spread (7 topics)
 - Range of a data set
 - How changing a value affects the range and IQR
 - Mean of a data set
 - Weighted mean
 - Mean and median of a data set
 - How changing a value affects the mean and median
 - Choosing the best measure to describe data
 - Comparing Data (6 topics)
 - Using back-to-back stem-and-leaf plots to compare data sets
 - Five-number summary and interquartile range
 - Interpreting a box-and-whisker plot
 - Interpreting a box-and-whisker plot: Problem type 2
 - Constructing a box-and-whisker plot
 - Using box-and-whisker plots to compare data sets
- Segments, Lines, and Angles (31 topics)
 - Points, Lines, and Planes (3 topics)
 - Naming segments, rays, and lines
 - Identifying congruent shapes on a grid
 - Matching basic geometric terms with their definitions
 - Distances and Midpoints on a Number Line (3 topics)
 - Introduction to segment addition
 - Midpoint of a number line segment: Integers
 - Segment addition and midpoints
 - Distances and Midpoints in the Coordinate Plane (4 topics)
 - Distance between two points in the plane: Exact answers
 - Identifying congruent segments in the plane
 - Midpoint of a line segment in the plane
 - Finding an endpoint of a line segment given the other endpoint and the midpoint
 - Angles (12 topics)
 - Drawing an angle with the protractor
 - Acute, obtuse, and right angles
 - Naming angles, sides of angles, and vertices
 - Introduction to angle addition
 - Finding the complement or supplement of an angle given a figure
 - Solving an equation involving complementary or supplementary angles
 - Writing and solving an equation involving complementary or supplementary angles
 - Angle addition with relationships between angles
 - Angle addition and angle bisectors
 - Identifying linear pairs and vertical angles

- Finding angle measures given two intersecting lines
- Solving equations involving vertical angles and linear pairs
- Segment and Angle Constructions (4 topics)
 - Constructing congruent line segments
 - Constructing an angle bisector
 - Constructing congruent angles
 - Constructing the perpendicular bisector of a line segment
- Parallel Lines and Transversals (5 topics)
 - Identifying corresponding and alternate angles
 - Finding angle measures given two parallel lines cut by a transversal
 - Solving equations involving angles and a pair of parallel lines
 - Constructing a pair of perpendicular lines
 - Constructing a pair of parallel lines
- Triangles and Quadrilaterals (21 topics)
 - Classifying Triangles (4 topics)
 - Acute, obtuse, and right triangles
 - Classifying scalene, isosceles, and equilateral triangles by side lengths
 - Identifying coordinates that give right triangles
 - Identifying scalene, isosceles, and equilateral triangles given coordinates of their vertices
 - Angles of Triangles (4 topics)
 - Finding an angle measure of a triangle given two angles
 - Finding an angle measure for a triangle with an extended side
 - Finding an angle measure given extended triangles
 - Finding angle measures of a triangle given angles with variables
 - Congruent Triangles (4 topics)
 - Identifying transformations
 - Determining if figures are related by rigid motions
 - Examining triangle congruence in terms of rigid motion
 - Exploring the triangle congruence theorems
 - Isosceles and Equilateral Triangles (2 topics)
 - Finding side lengths and angle measures of isosceles and equilateral triangles
 - Finding angle measures of an isosceles triangle given angles with variables
 - Triangle Constructions and Triangle Inequalities (3 topics)
 - Creating triangles from given side lengths: Problem type 1
 - Drawing triangles with given conditions: Side lengths and angle measures
 - Drawing a circle with a given radius or diameter
 - Quadrilaterals (4 topics)
 - Identifying parallelograms, rectangles, and squares
 - Properties of quadrilaterals
 - Proving that a quadrilateral with given vertices is a parallelogram
 - Classifying parallelograms in the coordinate plane
- Similarity and Transformations (40 topics)
 - Similar Figures (2 topics)
 - Identifying similar or congruent shapes on a grid
 - Finding a missing side length given two similar triangles
 - Proofs Involving Triangle Similarity (1 topics)
 - Proving the slope criterion for parallel or perpendicular lines
 - Translations (6 topics)
 - Translating a point and giving its coordinates: One step
 - Translating a point and giving its coordinates: Two steps
 - Properties of translated figures
 - Determining if figures are related by a translation
 - Translating a polygon
 - Understanding the definition of a translation
 - Reflections (8 topics)
 - Reflecting a point across an axis
 - Reflecting a point across an axis and giving its coordinates
 - Finding the coordinates of a point reflected across an axis
 - Reflecting a polygon across the x-axis or y-axis
 - Properties of reflected figures

- Determining if figures are related by a reflection
- Reflecting a polygon over a vertical or horizontal line
- Understanding the definition of a reflection
- Rotations (5 topics)
 - Rotating a point and giving its coordinates
 - Properties of rotated figures
 - Determining if figures are related by a rotation
 - Rotating a figure about the origin
 - Understanding the definition of a rotation
- Symmetry (3 topics)
 - Drawing lines of symmetry
 - Finding an angle of rotation
 - Identifying rotational symmetry and angles of rotation
- Congruence Transformations (7 topics)
 - Writing a rule to describe a translation
 - Writing a rule to describe a reflection
 - Writing a rule to describe a rotation
 - Identifying transformations that map a quadrilateral onto itself
 - Identifying transformations that map a regular polygon onto itself
 - Determining if figures are congruent and related by a transformation
 - Determining if figures are congruent and related by a sequence of transformations
- Dilations (8 topics)
 - Dilating a segment and giving the coordinates of its endpoints
 - The effect of dilation on side length
 - Determining if figures are related by a dilation
 - Finding a scale factor given a dilation in the coordinate plane
 - Dilating a figure
 - Performing a composition of dilations NEW
 - Performing a composition consisting of a rigid transformation and a dilation NEW
 - Writing a rule to describe a dilation
- Area, Volume, and Circles (7 topics)
 - Areas of Various Polygons (5 topics)
 - Area of a parallelogram
 - Area of a triangle
 - Finding the perimeter or area of a rectangle in the coordinate plane
 - Finding the perimeter of a triangle, trapezoid, or parallelogram in the coordinate plane
 - Finding the area of a triangle or parallelogram in the coordinate plane
 - Inscribed Angles and Polygons (2 topics)
 - Inscribing an equilateral triangle or a regular hexagon in a circle
 - Inscribing a square in a circle
- Other Topics Available(*) (831 additional topics)
 - Arithmetic Readiness (73 topics)
 - Factors
 - Prime numbers
 - Prime factorization
 - Prime factorization: Exponent notation NEW
 - Greatest common factor of 2 numbers
 - Greatest common factor of 3 numbers
 - Least common multiple of 2 numbers
 - Least common multiple of 3 numbers
 - Finding the LCD of two fractions
 - Addition or subtraction of fractions with the same denominator
 - Word problem involving addition or subtraction of fractions with different denominators
 - Multiplication of 3 fractions
 - Word problem involving fractions and multiplication
 - The reciprocal of a number
 - Division involving a whole number and a fraction
 - Fraction division
 - Complex fraction without variables: Problem type 1
 - Word problem involving fractions and division
 - Writing an improper fraction as a mixed number
 - Writing a mixed number as an improper fraction
 - Mixed number addition with the same denominator and renaming
 - Mixed number subtraction with the same denominator and renaming

- Addition or subtraction of mixed numbers with different denominators without renaming
- Addition of mixed numbers with different denominators and renaming
- Subtraction of mixed numbers with different denominators and renaming
- Word problem involving addition or subtraction of mixed numbers with different denominators
- Mixed number multiplication
- Multiplication of a mixed number and a whole number
- Division with a mixed number and a whole number
- Mixed number division
- Word problem involving multiplication or division with mixed numbers
- Fractional position on a number line
- Plotting fractions on a number line
- Using a common denominator to order fractions
- Reading decimal position on a number line: Tenths
- Reading decimal position on a number line: Hundredths
- Introduction to ordering decimals
- Ordering decimals
- Using a calculator to convert a fraction to a rounded decimal
- Ordering fractions and decimals
- Addition of aligned decimals
- Decimal addition with 3 numbers
- Word problem with addition of 3 or 4 decimals and whole numbers
- Introduction to decimal multiplication
- Decimal multiplication: Problem type 1
- Converting a fraction to a terminating decimal: Advanced
- Converting a fraction to a repeating decimal: Basic
- Converting a fraction to a repeating decimal: Advanced
- Converting a decimal to a proper fraction in simplest form: Basic
- Converting a decimal to a proper fraction in simplest form: Advanced
- Writing ratios using different notations
- Writing ratios for real-world situations
- Simplifying a ratio of whole numbers: Problem type 1
- Using tables to compare ratios
- Finding a unit price
- Computing unit prices to find the better buy
- Word problem on unit rates associated with ratios of whole numbers: Decimal answers
- Representing benchmark percentages on a grid
- Converting between percentages and decimals in a real-world situation
- Converting a percentage to a fraction in simplest form
- Using a calculator to convert a fraction to a rounded percentage
- Finding a percentage of a total amount: Real-world situations
- Finding a percentage of a total amount without a calculator: Sales tax, commission, discount
- Writing a ratio as a percentage
- Finding the rate of a tax or commission
- Measuring length to the nearest inch
- Measuring length to the nearest quarter or half inch
- Conversions involving measurements in feet and inches
- Word problem involving a U.S. Customary length conversion
- Measuring length to the nearest centimeter
- Measuring length to the nearest millimeter
- Metric distance conversion with whole number values
- Conversions with currency
- Real Numbers (63 topics)
 - Plotting opposite integers on a number line
 - Plotting rational numbers on a number line
 - Comparing integers using a number line
 - Using a number line to compare signed numbers in context
 - Using a calculator to approximate a square root
 - Approximating the location of irrational numbers on a number line
 - Ordering real numbers
 - Interpreting absolute values in context as distances from zero
 - Identifying a sum as a point located a given distance from another point
 - Identifying relative change when combining two quantities
 - Addition and subtraction with 4 or 5 integers
 - Word problem with addition or subtraction of integers
 - Operations with absolute value: Problem type 2
 - Finding the distance between two rational numbers on a number line in context
 - Signed fraction subtraction involving double negation
 - Signed fraction division
 - Signed decimal multiplication
 - Signed decimal division
 - Writing expressions using exponents
 - Power of 10: Positive exponent
 - Order of operations with whole numbers and grouping symbols

- Order of operations with whole numbers and exponents: Advanced
- Order of operations with fractions: Problem type 1
- Order of operations with fractions: Problem type 2
- Squaring decimal bases: Products greater than 0.1
- Exponents and decimals: Products less than 0.1
- Order of operations with decimals: Problem type 1
- Order of operations with decimals: Problem type 2
- Exponents and integers: Problem type 2
- Order of operations with integers and exponents
- Evaluating an algebraic expression: Whole number addition or subtraction
- Evaluating an algebraic expression: Whole number multiplication or division
- Evaluating an algebraic expression: Whole number operations and exponents
- Converting between temperatures in Fahrenheit and Celsius
- Evaluating a linear expression: Signed fraction multiplication with addition or subtraction
- Identifying numbers as integers or non-integers
- Identifying rational decimal numbers
- Identifying true statements about rational and irrational numbers
- Identifying numbers as rational or irrational
- Identifying like terms
- Introduction to properties of addition
- Properties of addition
- Introduction to adding fractions with variables and common denominators
- Introduction to the distributive property
- Understanding the distributive property
- Introduction to properties of multiplication
- Properties of real numbers
- Introduction to factoring with numbers
- Factoring a linear binomial
- Identifying properties used to simplify an algebraic expression
- Using distribution with double negation and combining like terms to simplify: Multivariate
- Finding the missing length in a figure
- Perimeter of a piecewise rectangular figure
- Writing algebraic expressions for the perimeter of a figure
- Distinguishing between the area and perimeter of a rectangle
- Areas of rectangles with the same perimeter
- Area of a piecewise rectangular figure
- Area between two rectangles
- Writing algebraic expressions for the area of a figure
- Word problem involving the area of a rectangle: Problem type 2
- Word problem involving the area between two rectangles
- U.S. Customary area unit conversion with whole number values
- Word problem on area involving conversions of U.S. Customary units: Problem type 1
- Linear Equations and Inequalities (91 topics)
 - Additive property of equality with fractions and mixed numbers
 - Multiplicative property of equality with whole numbers: Fractional answers
 - Solving an equation to find the value of an expression
 - Solving a multi-step equation given in fractional form
 - Solving a two-step equation with signed decimals
 - Solving a linear equation with several occurrences of the variable: Variables on both sides and two distributions
 - Clearing fractions in an equation
 - Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators
 - Solving a linear equation with several occurrences of the variable: Variables on both sides and fractional coefficients
 - Solving a linear equation with several occurrences of the variable: Fractional forms with binomial numerators
 - Solving equations with zero, one, or infinitely many solutions
 - Solving a fraction word problem using a linear equation of the form $Ax = B$
 - Choosing stories that can be represented by given one-step equations
 - Comparing arithmetic and algebraic solutions to a word problem
 - Choosing stories that can be represented by given two-step equations
 - Writing an equation of the form $A(x + B) = C$ to solve a word problem
 - Writing and solving a real-world problem given an equation with the variable on both sides
 - 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 a value mixture problem using a linear equation
 - Solving a word problem involving rates and time conversion
 - Solving a distance, rate, time problem using a linear equation
 - Finding side lengths of squares given an area and a perimeter
 - Finding side lengths of rectangles given one dimension and an area or a perimeter
 - Word problem on optimizing an area or perimeter
 - 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

- Finding a side length given the perimeter and side lengths with variables
- 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: Advanced
- 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 metric and U.S. Customary unit systems using dimensional analysis: U.S. Customary to metric
- **Converting between metric and U.S. Customary unit systems using dimensional analysis: Metric to U.S. Customary** NEW
- Word problem involving U.S. Customary length conversions using dimensional analysis
- Converting between compound units: Advanced
- Word problem involving conversion between compound units using dimensional analysis
- Solving a proportion of the form $(x+a)/b = c/d$
- Solving a proportion of the form $a/(x+b) = c/x$
- Introduction to solving a rational equation
- Solving a rational equation that simplifies to linear: Denominator x
- Word problem on proportions: Problem type 2
- Finding the total amount given the percentage of a partial amount
- 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 amount given the result of a percentage increase or decrease
- Finding the original price given the sale price and percent discount
- Finding the percentage increase or decrease: Basic
- Solving a percent mixture problem using a linear equation
- Finding simple interest without a calculator
- Finding the interest and future value of a simple interest loan or investment
- Solving an absolute value equation: Problem type 4
- Writing an absolute value equation to solve a word problem and describing the solution
- Calculating income tax
- Comparing discounts
- Examining a savings plan for college
- Calculations involving paying for college
- Comparing total costs for attending different colleges
- Distinguishing between fixed and variable expenses
- Computing percentages for categories of a budget
- Computations involving cost of living and hourly wage
- Comparing annual salaries of different occupations
- Calculations involving purchases with debit and credit cards
- Comparing costs of checking accounts
- Balancing a check register
- Reading a credit report
- Understanding the impact of a credit score
- **Determining the value of credit reports to borrowers and lenders** NEW
Deciding when it is applicable to pay with cash or credit and examining the advantages and disadvantages of different payment methods
- NEW Computing a person's net worth
- Calculating and comparing monthly payments using the ALEKS loan calculator
- Calculating monthly payment, total payment, and interest using the ALEKS loan calculator
- Calculating and comparing total loan payments using the ALEKS loan calculator
- Calculating and comparing simple interest and compound interest
- Writing sets of integers using set-builder and roster forms
- Union and intersection of finite sets
- Additive property of inequality with signed fractions
- Additive property of inequality with signed decimals
- Solving a linear inequality with multiple occurrences of the variable: Problem type 3
- Solving inequalities with no solution or all real numbers as solutions
- Solving a word problem involving area using a one-step linear inequality: Area and lengths
- Translating a sentence into a multi-step inequality
- Solving a word problem using a two-step linear inequality and describing the solution
- Writing a compound inequality given a graph on the number line
- Solving a compound linear inequality: Graph solution, advanced
- Writing an absolute value inequality given a graph on the number line
- Solving an absolute value inequality: Problem type 2
- Solving an absolute value inequality: Problem type 5
- The Coordinate Plane and Equations of Lines (42 topics)
 - 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
 - Plotting points that share a coordinate and using absolute value to find the distance between them
 - Writing a function rule given a table of ordered pairs: Two-step rules
 - Making a table and plotting points given a unit rate
 - Finding x - and y -intercepts of a line given the equation: Advanced
 - Graphing a line given its x - and y -intercepts
 - Identifying proportional relationships in tables by calculating unit rates: Whole numbers

- Determining whether a relationship is proportional given a real-world situation
 - Identifying proportional relationships in graphs: Basic
 - Graphing a relationship given a real-world situation to determine if the relationship is proportional
 - Writing an equation and describing a proportional relationship given a graph or table
 - Comparing proportional relationships given in different forms
 - Finding the coordinate that yields a given slope
 - Deriving the slope formula NEW
 - Identifying linear equations: Basic
 - Identifying linear equations: Advanced
 - Rewriting a linear equation in the form $Ax + By = C$
 - Writing an equation and graphing a line given its slope and y-intercept
 - Finding the slope and a point on a line given its equation in point-slope form
 - Graphing a line given its equation in point-slope form
 - Writing the equation of a line in point-slope form given the slope and a point
 - Writing the equation of a line in standard form given the slope and a point
 - Writing the equations of vertical and horizontal lines through a given point
 - Deriving the equation of a line through the origin NEW
 - Deriving the equation of a line not going through the origin NEW
 - Finding inputs and outputs of a two-step function that models a real-world situation: Two variable equation
 - Writing and evaluating a function that models a real-world situation: Advanced
 - Graphing ordered pairs and writing an equation from a table of values in context
 - Writing an equation and drawing its graph to model a real-world situation: Basic
 - Graphing a linear function that models a simple interest situation and identifying key features NEW
 - Identifying independent and dependent quantities from tables and graphs
 - Identifying independent and dependent variables from equations or real-world situations
 - 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
 - Classifying linear and nonlinear relationships from scatter plots
 - Using technology to calculate the correlation coefficients for two sets of bivariate data to compare the linear relationships NEW
 - Identifying outliers and clustering in scatter plots
- Functions and Systems (67 topics)
- Identifying functions given a verbal description NEW
 - Variable expressions as inputs of functions: Problem type 1
 - Evaluating a piecewise-defined function
 - Finding outputs of a one-step function that models a real-world situation: Function notation
 - Finding inputs and outputs of a two-step function that models a real-world situation: Function notation
 - Finding patterns in shapes
 - Finding inputs and outputs of a function from its graph
 - Domain and range from the graph of a discrete relation
 - Finding intercepts of a nonlinear function given its graph
 - Finding local maxima and minima of a function given the graph
 - Graphing an integer function and finding its range for a given domain
 - 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 $y = |x|$
 - Graphing an absolute value equation in the plane: Basic
 - Graphing an absolute value equation in the plane: Advanced
 - 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 parabola of the form $y = (x-h)^2 + k$
 - Classifying function types given graphs of functions: Linear, exponential, and quadratic NEW
 - Classifying function types given graphs of functions: Absolute value, cubic, square root, and cubic root NEW
 - Classifying function types given equations of functions: Problem type 1 NEW
 - Classifying function types given equations of functions: Problem type 2 NEW
 - 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
 - Finding the average rate of change of a function given its equation
 - Word problem involving average rate of change
 - 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
 - Graphing quadratic functions of the form $y=ax^2$ and $y=(bx)^2$ by transforming the parent graph $y=x^2$
 - Translating the graph of an absolute value function: One step
 - Translating the graph of an absolute value function: Two steps
 - How the leading coefficient affects the graph of an absolute value function

- Classifying systems of linear equations from graphs
- 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
- Introduction to solving a 3x3 system of linear equations
- Solving a 3x3 system of linear equations: Problem type 1
- Solving a 3x3 system of linear equations: Problem type 2
- Scalar multiplication of a matrix
- Addition or subtraction of matrices
- Linear combination of matrices
- Multiplication of matrices: Basic
- Squaring and multiplying 2x2 matrices
- Multiplication of matrices: Advanced
- Word problem involving multiplication of matrices
- Completing Gauss-Jordan elimination with a 2x2 matrix
- Gauss-Jordan elimination with a 2x2 matrix
- Completing Gauss-Jordan elimination with a 3x3 matrix
- Writing solutions to 3x3 systems of linear equations from augmented matrices
- Solving a system of linear equations given its augmented matrix
- Finding the inverse of a 2x2 matrix
- Finding the inverse of a 3x3 matrix
- Solving a word problem involving a system of linear equations by graphing and estimating a solution
- [Writing and solving a system of two linear equations given a verbal description](#) NEW
- Solving a percent mixture problem using a system of linear equations
- Solving a tax rate or interest rate problem using a system of linear equations
- Solving a word problem using a 3x3 system of linear equations: Problem type 1
- 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 three linear inequalities
- 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

■ Exponents and Exponential Functions (75 topics)

- Introduction to the product rule with positive exponents: Whole number base
- Understanding the product rule of exponents
- Product rule with positive exponents: Univariate
- Product rule with positive exponents: Multivariate
- Introduction to the power of a power rule with positive exponents: Whole number base
- Ordering numbers with positive exponents
- Understanding the power rules 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
- Introduction to the quotient rule with positive exponents: Whole number base
- 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
- Power of 10: Negative exponent
- Ordering numbers with negative exponents
- Rewriting an algebraic expression without a negative exponent
- Introduction to the product rule with negative exponents: Whole number base
- Introduction to the product rule with negative exponents
- Product rule with negative exponents
- Introduction to the quotient rule with negative exponents: Whole number base
- Quotient rule with negative exponents: Problem type 1
- Quotient rule with negative exponents: Problem type 2
- Introduction to the power of a power rule with negative exponents: Whole number base
- 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
- Finding all square roots of a number
- Estimating a square root
- Square root of a rational perfect square
- Square roots of perfect squares with signs
- Cube root of an integer
- Order of operations with exponents and radicals
- Finding n^{th} roots of perfect n^{th} powers with signs
- Simplifying the square root of a whole number less than 100
- Simplifying the square root of a whole number greater than 100
- Introduction to square root multiplication
- Square root multiplication: Basic

- Square root multiplication: Advanced
- Simplifying a quotient of square roots
- Rationalizing a denominator: Quotient involving square roots
- Classifying sums and products as rational or irrational
- Converting between radical form and exponent form
- Using the properties of integer exponents to define rational exponents
- 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
- Introduction to scientific notation with positive exponents
- Scientific notation with a positive exponent
- Introduction to scientific notation with negative exponents
- Scientific notation with a negative exponent
- Converting between scientific notation and standard form in a real-world situation
- Multiplying numbers written in scientific notation: Basic
- Multiplying numbers written in scientific notation: Advanced
- Multiplying numbers written in decimal form or scientific notation in a real-world situation
- Dividing numbers written in scientific notation: Basic
- Dividing numbers written in scientific notation: Advanced
- Finding the scale factor between numbers given in scientific notation in a real-world situation
- 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 $f(x)=-b^{-x}$
- Finding the initial amount and asymptote given a graph of an exponential function
- Finding the final amount in a word problem on compound interest
- Finding the future value and interest for an investment earning compound interest
- Finding the present value of an investment earning compound interest
- Identifying arithmetic and geometric sequences
- Data Analysis (33 topics)
 - Identifying statistical questions
 - Choosing an appropriate method for gathering data: Problem type 1
 - Choosing an appropriate method for gathering data: Problem type 2
 - Finding if a question can be answered by the data
 - Constructing a bar graph for non-numerical data
 - Interpreting a bar graph
 - Interpreting a double bar graph
 - Interpreting a stem-and-leaf plot
 - Constructing a stem-and-leaf plot NEW
 - Interpreting a circle graph or pie chart
 - Finding a percentage of a total amount in a circle graph
 - Angle measure in a circle graph
 - Mode of a data set
 - Finding the mode and range from a line plot
 - Interpreting a percent bar graph to summarize categorical data using the mode NEW
 - Using a model to find the mean
 - Understanding the mean graphically: Two bars
 - Understanding the mean graphically: Four or more bars
 - Finding the mean of a symmetric distribution
 - 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
 - Finding outliers in a data set
 - Identifying peaks, symmetry, gaps, and clusters in a line plot
 - Identifying the center, spread, and shape of a data set
 - Computing mean absolute deviation from a list of numerical values
 - Percentiles
 - Population standard deviation
 - Comparing measures of center and variation
 - Finding sample size and comparing samples for estimating the mean
 - Comparing sample means
 - Using the graph of a distribution to find probabilities: Basic
 - Using the empirical rule to identify values and percentages of a normal distribution
 - Word problem involving calculations from a normal distribution
- Segments, Lines, and Angles (55 topics)
 - Analyzing relationships between points, lines, and planes given a figure
 - Computing distances between decimals on a number line
 - Finding a point on a number line given the length of a segment and another point

- Midpoint of a number line segment: Decimals
- Using a segment's midpoint and endpoint to locate the other endpoint
- Finding a point that partitions a number line segment in a given fractional relationship
- Finding a point that partitions a number line segment in a given ratio
- Distance between two points in the plane: Decimal answers
- Deriving the distance formula using the Pythagorean Theorem (NEW)
- Deriving the midpoint formula on the coordinate plane using previous knowledge about midpoint on a number line (NEW)
- Finding a point that partitions a segment in the plane in a given fractional relationship
- Finding a point that partitions a segment in the plane in a given ratio
- Finding the weighted average of two points on a line segment in the plane (NEW)
- Finding supplementary and complementary angles
- Writing and solving an equation involving adjacent angles (NEW)
- Writing and solving an equation involving vertical angles
- Making conjectures given a geometric construction
- Identifying statements
- Identifying simple and compound statements
- Negation of a statement
- Conditional statements and negations
- Symbolic translation of negations, conjunctions, and disjunctions: Basic
- Symbolic translation of conditional and biconditional statements: Basic
- The converse, inverse, and contrapositive of a conditional statement
- Writing the converse, inverse, and contrapositive of a conditional statement and determining their truth values
- Writing a biconditional statement as a conditional statement and its converse and determining truth values
- Finding counterexamples to conjectures
- Symbolic translation of negations, conjunctions, and disjunctions: Advanced
- Using De Morgan's Laws to identify negations and equivalent statements
- Symbolic translation involving three statements
- Symbolic translation of conditional and biconditional statements: Advanced
- Understanding quantifiers
- Negation of a quantified statement
- Introduction to truth tables with negations, conjunctions, or disjunctions
- Truth tables with conjunctions or disjunctions
- Completing rows of truth tables: Conjunctions and disjunctions
- Using logic to test a claim: Conjunction or disjunction
- Introduction to truth tables with conditional statements
- Truth tables with conjunctions, disjunctions, and conditional statements
- Identifying equivalent statements and negations of a conditional statement
- Using logic to test a claim: Conditional statement, basic
- Determining if statements are logically equivalent
- Introduction to truth tables with biconditional statements
- Using truth tables to determine the validity of an argument
- Conditional statements and deductive reasoning
- Validity of an argument
- Translating an argument and determining its validity
- Distinguishing between undefined terms, definitions, postulates, conjectures, and theorems
- Introduction to proofs: Justifying statements
- Proofs involving segment congruence
- Proofs involving angle congruence
- Solving equations involving angles and two pairs of parallel lines
- Establishing facts about the angles created when parallel lines are cut by a transversal
- Introduction to proofs involving parallel lines
- Proofs involving parallel lines
- Triangles and Quadrilaterals (65 topics)
 - Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
 - Finding an angle measure given a triangle and parallel lines
 - Writing an equation to find angle measures of a triangle given angles with variables
 - Establishing facts about the interior angles of a triangle
 - Establishing facts about the interior and exterior angles of a triangle
 - Identifying and naming congruent parts of congruent triangles
 - Completing proofs involving congruent triangles using SSS or SAS
 - Introduction to proving triangles congruent using SSS or SAS
 - Identifying and naming congruent triangles
 - Completing proofs involving congruent triangles using ASA or AAS
 - Introduction to proving triangles congruent using ASA or AAS
 - Proofs involving congruent triangles and segment or angle bisectors
 - Separating overlapping triangles and identifying common features
 - Proofs involving congruent triangles that overlap: Basic
 - Proofs involving congruent triangles with parallel or perpendicular segments
 - Determining when to apply the HL congruence property
 - Introduction to proving triangles congruent using the HL property
 - Introduction to proofs involving congruent triangles and CPCTC
 - Proofs involving congruent triangles, parallel or perpendicular segments, and CPCTC
 - Proofs involving congruent triangles that overlap: Advanced

- Finding an angle measure for a triangle sharing a side with another triangle
- Proofs of theorems involving isosceles triangles
- Introduction to the Pythagorean Theorem
- Pythagorean Theorem
- Word problem involving the Pythagorean Theorem
- Word problem involving the Pythagorean Theorem in three dimensions
- Using the Pythagorean Theorem repeatedly
- Using the Pythagorean Theorem to find distance on a grid
- Using the Pythagorean Theorem to find the distance between two points in the plane in context
- Identifying side lengths that give right triangles
- Demonstrating the converse of the Pythagorean Theorem
- [Informal proof of the converse of the Pythagorean Theorem](#) (NEW)
- Classifying segments inside triangles
- Using the circumcenter of a triangle to find segment lengths
- Using the incenter of a triangle to find segment lengths and angle measures
- Using the centroid of a triangle to find segment lengths
- [Verifying the Centroid Theorem](#) (NEW)
- Introduction to the triangle midsegment theorem
- Proving the triangle midsegment theorem in the coordinate plane
- Proof involving points on the perpendicular bisector of a line segment
- Creating triangles from given side lengths: Problem type 2
- Using triangle inequality to determine if side lengths form a triangle
- Using triangle inequality to determine possible lengths of a third side
- Determining if a triangle is possible based on given angle measures
- Determining if given measurements define a unique triangle, more than one triangle, or no triangle
- Drawing triangles with given conditions: Angle measures
- Drawing triangles with given side lengths using a compass
- Relationship between angle measures and side lengths in a triangle
- Relationship between angle measures and side lengths in two triangles
- Using the hinge theorem
- Indirect proof (proof by contradiction)
- Naming polygons
- Sum of the angle measures of a quadrilateral
- Classifying parallelograms
- Finding measures involving diagonals of parallelograms
- [Investigating properties of diagonals of parallelograms](#) (NEW)
- Conditions for parallelograms
- Finding measures involving diagonals of rectangles
- Finding angle measures involving diagonals of a rhombus
- Conditions for quadrilaterals
- Completing proofs of theorems involving sides of a parallelogram
- Completing proofs of theorems involving angles of a parallelogram
- Drawing and identifying a polygon in the coordinate plane
- Finding the coordinates of a point to make a parallelogram
- Finding coordinates of vertices of polygons
- **Similarity and Transformations (27 topics)**
 - Finding angle measures of a triangle given two angles of a similar triangle
 - Relationships about ratios within and between similar triangles
 - Finding angle measures and side ratios to determine if two triangles are similar
 - Similar polygons
 - Similar right triangles
 - Indirect measurement
 - Triangles and parallel lines
 - Triangles and angle bisectors
 - Determining if figures are related by similarity transformations
 - Examining triangle similarity in terms of similarity transformations
 - Identifying and naming similar triangles
 - Proofs involving similar triangles
 - Completing proofs involving the triangle proportionality theorem
 - Identifying similar right triangles that overlap
 - Proving the Pythagorean Theorem using similar triangles
 - Using a translated point to find coordinates of other translated points
 - Reflecting a point across both coordinate axes
 - Finding the coordinates of a point reflected across both axes
 - Finding the coordinates of three points reflected over an axis
 - Finding the coordinates of a point reflected across an axis and translated
 - [Identifying figures that have rotational symmetry or reflectional symmetry](#) (NEW)
 - Rotational and point symmetries
 - The effect of dilation on area
 - Determining if figures are similar and related by a sequence of transformations
 - Exploring similarity of circles
 - Exploring the effect of dilation on lines
 - Identifying transformations and determining if they preserve congruent figures

- Area, Volume, and Circles (85 topics)
 - Word problem on population density
 - Finding the area of a right triangle using the Pythagorean Theorem
 - Computing an area using the Pythagorean Theorem
 - Area involving rectangles and triangles
 - [Decomposing a trapezoid or parallelogram to find its area given a situation in context](#) NEW
 - Area of a trapezoid
 - Area of a rhombus
 - Finding the area of a rhombus using the Pythagorean Theorem
 - Finding the area of a trapezoid, rhombus, or kite in the coordinate plane
 - Side lengths, perimeters, and areas of similar polygons
 - Introduction to a circle: Diameter, radius, and chord
 - Circumference of a circle
 - Finding the radius or the diameter of a circle given its circumference
 - Informal argument for the formula of the circumference of a circle
 - Perimeter involving rectangles and circles
 - Area of a circle
 - Circumference and area of a circle
 - Circumference and area of a circle: Exact answers in terms of π
 - Distinguishing between the area and circumference of a circle
 - Informal argument for the formula of the area of a circle
 - Area involving rectangles and circles
 - Classifying solids
 - Vertices, edges, and faces of a solid
 - Identifying geometric shapes that model real-world objects
 - Nets of solids
 - Counting the cubes in a solid made of cubes
 - Side views of a solid made of cubes
 - Identifying horizontal and vertical cross sections of solids
 - Identifying solids generated by rotations of two-dimensional regions
 - Surface area of a cube or a rectangular prism
 - Using a net to find the surface area of a rectangular prism
 - Using a net to find the lateral surface area and total surface area of a rectangular prism
 - [Deriving the formula for the surface area of a rectangular prism](#) NEW
 - Word problem involving the surface area of a rectangular prism
 - Word problem involving U.S. Customary conversions, surface area, and cost
 - Surface area of a triangular prism
 - Using a net to find the surface area of a triangular prism
 - Using a net to find the lateral surface area and total surface area of a triangular prism
 - [Deriving the formula for the surface area of a right triangular prism](#) NEW
 - Surface area of a cylinder
 - Surface area of a cylinder: Exact answers in terms of π
 - [Deriving the formula for the surface area of a cylinder](#) NEW
 - Volume of a rectangular prism
 - Writing equivalent expressions for the volume of a rectangular prism
 - Distinguishing between surface area and volume
 - Solving problems involving the volume of a rectangular prism in context
 - Word problem involving the volume of a rectangular prism
 - Word problem involving the rate of filling or emptying a rectangular prism
 - Computations involving density, mass, and volume
 - Word problem on density involving the volume of a rectangular solid
 - Volume of a piecewise rectangular prism
 - Word problem involving the volume of a piecewise rectangular prism
 - Volume of a triangular prism
 - Word problem involving the volume of a triangular prism
 - Volume of a cylinder
 - Describing the formula for the volume of a cylinder
 - Informal argument for the formula of the volume of a cylinder
 - Word problem involving the volume of a cylinder
 - Word problem involving the rate of filling or emptying a cylinder
 - Word problem on density involving the volume of a cylindrical solid
 - Volume of a pyramid
 - Relating the volumes of a rectangular prism and a rectangular pyramid
 - Relating the volumes of a triangular prism and a triangular pyramid
 - Volume of a cone
 - Volume of a cone: Exact answers in terms of π
 - Informal argument for the formula of the volume of a cone
 - Relating the volumes of a cylinder and a cone
 - Word problem involving the volume of a cone
 - Volume of a sphere
 - Word problem involving the volume of a sphere
 - Identifying chords, secants, and tangents of a circle
 - Tangents of a circle: Problem type 1
 - Tangents of a circle: Problem type 2

- Constructing a tangent of a circle
- Naming and finding measures of central angles, inscribed angles, and arcs of a circle
- Applying properties of radii, diameters, and chords
- Central angles and inscribed angles of a circle
- Central angles and angles involving chords and tangents of a circle
- Inscribed angles in relation to a diameter or a polygon inscribed in a circle
- Inscribed angles and angles involving chords and tangents of a circle
- Establishing facts about a quadrilateral inscribed in a circle
- Inscribing a circle in a triangle
- Circumscribing a circle about a triangle
- Angles of intersecting secants and tangents
- Lengths of chords, secants, and tangents
- Polynomials and Quadratic Functions (105 topics)
 - Degree and leading coefficient of a univariate polynomial
 - Degree of a multivariate 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
 - 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 out a binomial from a polynomial: GCF factoring, basic
 - Factoring a univariate polynomial by grouping: Problem type 1
 - Factoring a univariate polynomial by grouping: Problem type 2
 - Factoring a multivariate polynomial by grouping: Problem type 1
 - Factoring a multivariate polynomial by grouping: Problem type 2
 - Factoring a quadratic 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 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 polynomial involving a GCF and a difference of squares: Multivariate
 - Factoring a product of a quadratic trinomial and a monomial
 - Factoring with repeated use of the difference of squares formula
 - Factoring a sum or difference of two cubes
 - 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
 - Writing a quadratic equation given the roots and the leading coefficient
 - Solving a word problem using a quadratic equation with rational roots
 - Writing and solving a quadratic equation for a real-world problem involving area or volume
 - Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
 - Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
 - Graphing a parabola of the form $y = a(x-h)^2 + k$
 - Completing the square

- Graphing a parabola of the form $y = x^2 + bx + c$
- Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
- Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients
- Finding the zeros of a quadratic function given its equation
- Writing a quadratic function given its zeros
- Finding the linear factors of a quadratic function given its zeros and describing the general relationship between linear factors and zeros

NEW

- Finding the zeros of a quadratic function given its linear factors and describing the general relationship between linear factors and zeros

NEW

- Finding the x-intercept(s) and the vertex of a parabola
- Using a graphing calculator to find the zeros of a quadratic function
- Using a graphing calculator to find the x-intercept(s) and vertex of a quadratic function
- Writing the equation of a quadratic function given a real-world description
- Rewriting a quadratic function in standard form
- Rewriting a quadratic function to find its vertex and sketch its graph
- Rewriting a quadratic function to find its maximum or minimum and axis of symmetry
- Finding the maximum or minimum of a quadratic function
- Word problem involving the maximum or minimum of a quadratic function
- Finding the domain and range from the graph of a parabola
- Range of a quadratic function
- Graphing a quadratic function that models a real-world situation and identifying key features
- Writing the equation of a quadratic function given a table of values
- Writing the equation of a quadratic function given its x-intercepts and another point
- Writing the equation of a quadratic function given its graph
- Solving a quadratic equation by graphing
- Comparing properties of quadratic functions given in different forms
- Classifying the graph of a function
- Comparing linear, quadratic, and exponential functions given in different forms
- Determining whether a given situation is best modeled by a linear, exponential, or quadratic function
- Choosing a quadratic model and using it to make a prediction
- Using technology to determine the better regression model for a given data set and using that model to make a prediction: Exponential and quadratic

NEW

- Solving an equation of the form $x^2 = a$ using the square root property
- Solving a quadratic equation using the square root property: Decimal answers, basic
- Solving a quadratic equation using the square root property: Decimal answers, advanced
- Applying the quadratic formula: Exact answers
- Applying the quadratic formula: Decimal answers
- Deriving the quadratic formula NEW
- Solving a word problem using a quadratic equation with irrational roots
- Identifying the center and radius to graph a circle given its equation in standard form
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle and identifying points that lie on the circle
- Deriving the equation of a circle using the Pythagorean Theorem
- Sum, difference, and product of two functions
- Introduction to the composition of two functions
- Composition of two functions: Basic
- Inverse functions: Linear, discrete
- Finding, evaluating, and interpreting an inverse function for a given linear relationship

■ Radicals and Trigonometry (50 topics)

- Square roots of integers raised to even exponents
- Introduction to simplifying a radical expression with an even exponent
- Square root of a perfect square monomial
- 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 quotient involving a sum or difference with a square root
- 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
- Simplifying a sum or difference of radical expressions: Multivariate
- 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 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
- 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
- Sine, cosine, and tangent ratios: Numbers for side lengths
- Sine, cosine, and tangent ratios: Variables for side lengths
- Using a calculator to approximate sine, cosine, and tangent values
- 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
- Understanding trigonometric ratios through similar right triangles
- Relationship between the sines and cosines of complementary angles
- Using similar right triangles to find trigonometric ratios
- Using a trigonometric ratio to find a side length in a right triangle
- Solving 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
- Writing a vector in component form given its initial and terminal points
- Magnitude of a vector given in component form
- Vector addition and scalar multiplication: Component form
- Linear combination of vectors: Component 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 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 component form
- Finding the angle between two vectors given in component form
- Using the dot product to find perpendicular vectors

***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.