



High School Geometry

This course covers the topics shown below.

Students navigate learning paths based on their level of readiness.

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

Curriculum (510 topics + 242 additional topics)

- Algebra Review (146 topics)
 - ◆ Whole Numbers, Fractions, and Decimals (29 topics)
 - ◇ Introduction to exponents
 - ◇ Order of operations with whole numbers
 - ◇ Order of operations with whole numbers and exponents: Basic
 - ◇ Simplifying a fraction
 - ◇ Equivalent fractions
 - ◇ Division involving zero
 - ◇ Least common multiple of 2 numbers
 - ◇ Introduction to addition or subtraction of fractions with different denominators
 - ◇ Addition or subtraction of fractions with different denominators
 - ◇ Product of a unit fraction and a whole number
 - ◇ Product of a fraction and a whole number: Problem type 1
 - ◇ Fraction multiplication
 - ◇ Product of a fraction and a whole number: Problem type 2
 - ◇ Exponents and fractions
 - ◇ The reciprocal of a number
 - ◇ Division involving a whole number and a fraction
 - ◇ Fraction division
 - ◇ Complex fraction without variables: Problem type 1
 - ◇ Decimal place value: Tenths and hundredths
 - ◇ Rounding decimals
 - ◇ Introduction to ordering decimals
 - ◇ Using a calculator to convert a fraction to a rounded decimal
 - ◇ Addition of aligned decimals
 - ◇ Decimal subtraction: Basic
 - ◇ Decimal subtraction: Advanced
 - ◇ Introduction to decimal multiplication
 - ◇ Multiplication of a decimal by a whole number
 - ◇ Multiplication of a decimal by a power of ten
 - ◇ Division of a decimal by a whole number
 - ◆ Signed Numbers (17 topics)
 - ◇ Plotting integers on a number line
 - ◇ Ordering integers
 - ◇ 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
- ◇ Integer multiplication and division
- ◇ Multiplication of 3 or 4 integers
- ◇ Order of operations with integers
- ◇ Signed fraction addition or subtraction: Basic
- ◇ Signed fraction multiplication: Basic
- ◇ Exponents and integers: Problem type 1
- ◇ Exponents and signed fractions
- ◇ Absolute value of a number
- ◇ Operations with absolute value: Problem type 1
- ◆ Evaluating Expressions and Properties of Real Numbers (15 topics)
 - ◇ Evaluating an algebraic expression: Whole number addition or subtraction
 - ◇ Evaluating an algebraic expression: Whole number multiplication or division
 - ◇ 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
 - ◇ Combining like terms: Whole number coefficients
 - ◇ Combining like terms: Integer coefficients
 - ◇ Multiplying a constant and a linear monomial
 - ◇ Distributive property: Whole number coefficients
 - ◇ Distributive property: Integer coefficients
 - ◇ Using distribution and combining like terms to simplify: Univariate
 - ◇ Combining like terms in a quadratic expression
 - ◇ Introduction to adding fractions with variables and common denominators
- ◆ Linear Equations (29 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
 - ◇ Multiplicative property of equality with whole numbers
 - ◇ Multiplicative property of equality with whole numbers: Fractional answers
 - ◇ Multiplicative property of equality with fractions
 - ◇ Multiplicative property of equality with integers
 - ◇ Multiplicative property of equality with signed fractions
 - ◇ Identifying solutions to a linear equation in one variable: Two–step equations
 - ◇ 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 linear equation with several occurrences of the variable: Variables on both sides and two distributions
- ◇ Introduction to solving a rational equation
- ◇ Solving a rational equation that simplifies to linear: Denominator x
- ◇ Translating a phrase into a one-step expression
- ◇ Translating a sentence into a one-step equation
- ◇ Writing an equation to represent a proportional relationship
- ◆ Solving Formulas for a Variable (4 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 multiplication or division: Advanced
 - ◇ Solving for a variable in terms of other variables using addition or subtraction with division
- ◆ Applications Involving Percentages (1 topics)
 - ◇ Writing a ratio as a percentage
- ◆ Inequalities (8 topics)
 - ◇ Translating a sentence by using an inequality symbol
 - ◇ Introduction to identifying solutions to an inequality
 - ◇ Translating a sentence into a compound inequality
 - ◇ Additive property of inequality with whole numbers
 - ◇ Additive property of inequality with integers
 - ◇ Multiplicative property of inequality with whole numbers
 - ◇ Solving a two-step linear inequality with whole numbers
 - ◇ Solving a two-step linear inequality: Problem type 1
- ◆ Exponents and Polynomials (18 topics)
 - ◇ Introduction to the product rule of exponents
 - ◇ Product rule with positive exponents: Univariate
 - ◇ Introduction to the power of a product rule of exponents
 - ◇ Simplifying a ratio of multivariate monomials: Basic
 - ◇ Simplifying a sum or difference of two univariate polynomials
 - ◇ Multiplying a univariate polynomial by a monomial with a positive coefficient
 - ◇ Multiplying binomials with leading coefficients of 1
 - ◇ Multiplying binomials with leading coefficients greater than 1
 - ◇ Multiplying conjugate binomials: Univariate
 - ◇ Multiplying binomials in two variables
 - ◇ Squaring a binomial: Univariate
 - ◇ Squaring a binomial: Multivariate
 - ◇ Factors
 - ◇ Greatest common factor of 2 numbers
 - ◇ Factoring a linear binomial
 - ◇ Factoring a quadratic with leading coefficient 1
 - ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 1
 - ◇ Factoring a perfect square trinomial with leading coefficient 1
- ◆ Radicals (10 topics)
 - ◇ Square root of a perfect square
 - ◇ Using a calculator to approximate a square root
 - ◇ Square root of a rational perfect square
 - ◇ 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
 - ◇ Introduction to square root addition or subtraction
 - ◇ Simplifying a quotient of square roots
 - ◇ Rationalizing a denominator: Quotient involving square roots

- ◆ Introduction to Perimeter and Area (15 topics)
 - ◇ Perimeter of a polygon
 - ◇ Perimeter of a square or a rectangle
 - ◇ Finding the missing length in a figure
 - ◇ Writing algebraic expressions for the perimeter of a figure
 - ◇ Finding a side length given the perimeter and side lengths with variables
 - ◇ Area of a square or a rectangle
 - ◇ Perimeter and area on a grid
 - ◇ 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
 - ◇ 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 involving the area of a square or a rectangle
 - ◇ Word problem on optimizing an area or perimeter
- Segments and Angles (37 topics)
 - ◆ Points, Lines, and Planes (5 topics)
 - ◇ Naming segments, rays, and lines
 - ◇ Analyzing relationships between points, lines, and planes given a figure
 - ◇ Identifying congruent shapes on a grid
 - ◇ Identifying parallel and perpendicular lines
 - ◇ Matching basic geometric terms with their definitions
 - ◆ Distances and Midpoints on a Number Line (5 topics)
 - ◇ Introduction to segment addition
 - ◇ Computing the distance between two integers 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: Integers
 - ◇ Segment addition and midpoints
 - ◆ Ordered Pairs (3 topics)
 - ◇ Reading a point in the coordinate plane
 - ◇ Plotting a point in the coordinate plane
 - ◇ Table for a linear equation
 - ◆ Distances and Midpoints in the Coordinate Plane (7 topics)
 - ◇ Finding distances between points that share a common coordinate given the graph
 - ◇ Finding distances between points that share a common coordinate given their coordinates
 - ◇ Introduction to the Pythagorean Theorem
 - ◇ Pythagorean Theorem
 - ◇ Distance between two points in the plane: Exact answers
 - ◇ Identifying congruent segments in the plane
 - ◇ Midpoint of a line segment in the plane
 - ◆ Angles (13 topics)
 - ◇ Measuring an angle with the protractor
 - ◇ Drawing an angle with the protractor
 - ◇ Acute, obtuse, and right angles
 - ◇ Naming angles, sides of angles, and vertices
 - ◇ Finding supplementary and complementary angles
 - ◇ Introduction to angle addition
 - ◇ Finding the complement or supplement of an angle given a figure
 - ◇ 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
- Reasoning (13 topics)
 - ◆ Patterns and Inductive Reasoning (3 topics)
 - ◇ Finding the next terms of an arithmetic sequence with whole numbers
 - ◇ Finding the next terms of a geometric sequence with whole numbers
 - ◇ Finding patterns in shapes
 - ◆ Conditional Statements and Deductive Reasoning (7 topics)
 - ◇ Interpreting a Venn diagram of 2 sets
 - ◇ Conditional statements and negations
 - ◇ 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
 - ◇ Conditional statements and deductive reasoning
 - ◆ Proofs Involving Segments and Angles (3 topics)
 - ◇ Introduction to proofs: Justifying statements
 - ◇ Proofs involving segment congruence
 - ◇ Proofs involving angle congruence
- Lines (31 topics)
 - ◆ 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
 - ◇ Solving equations involving angles and two pairs of parallel lines
 - ◇ Establishing facts about the angles created when parallel lines are cut by a transversal
 - ◆ Line Constructions (2 topics)
 - ◇ Constructing a pair of perpendicular lines
 - ◇ Constructing a pair of parallel lines
 - ◆ Proofs Involving Parallel Lines (2 topics)
 - ◇ Introduction to proofs involving parallel lines
 - ◇ Proofs involving parallel lines
 - ◆ Graphing Lines (8 topics)
 - ◇ Identifying solutions to a linear equation in two variables
 - ◇ 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
 - ◆ Slope of Lines (3 topics)
 - ◇ Finding slope given the graph of a line on a grid
 - ◇ Finding slope given two points on the line
 - ◇ Finding the slope of horizontal and vertical lines
 - ◆ Equations of Lines (5 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 of a line given its slope and y -intercept
- ◇ Writing an equation in slope-intercept form given the slope and a point
- ◇ Writing an equation of a line given the y -intercept and another point
- ◆ Parallel and Perpendicular Lines (5 topics)
 - ◇ 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
- ◆ Systems of Equations (1 topics)
 - ◇ Solving a system of linear equations of the form $y = mx + b$
- Triangles (48 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 (6 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 an angle measure given a triangle and parallel lines
 - ◇ Finding angle measures of a triangle given angles with variables
 - ◇ Establishing facts about the interior angles of a triangle
 - ◆ Congruent Triangles (5 topics)
 - ◇ Identifying transformations
 - ◇ Identifying and naming congruent parts of congruent triangles
 - ◇ Determining if figures are related by rigid motions
 - ◇ Examining triangle congruence in terms of rigid motion
 - ◇ Exploring the triangle congruence theorems
 - ◆ Proving Triangle Congruence (14 topics)
 - ◇ 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
 - ◆ Isosceles and Equilateral Triangles (4 topics)
 - ◇ 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 an isosceles triangle given angles with variables
 - ◇ Proofs of theorems involving isosceles triangles
 - ◆ Segments within Triangles (7 topics)

- ◇ 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
- ◇ 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
- ◆ Triangle Constructions and Triangle Inequalities (8 topics)
 - ◇ Creating triangles from given side lengths: Problem type 1
 - ◇ Using triangle inequality to determine if side lengths form a triangle
 - ◇ Using triangle inequality to determine possible lengths of a third side
 - ◇ Drawing a circle with a given radius or diameter
 - ◇ 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)
- Polygons and Quadrilaterals (21 topics)
 - ◆ Angles of Polygons (6 topics)
 - ◇ Naming polygons
 - ◇ Sum of the angle measures of a quadrilateral
 - ◇ Finding the sum of the interior angle measures of a convex polygon given the number of sides
 - ◇ Finding the number of sides of a convex polygon given the sum of the measures of the interior angles
 - ◇ Finding a missing interior angle measure in a convex polygon
 - ◇ Finding the measures of an interior angle and an exterior angle of a regular polygon
 - ◆ Parallelograms and Trapezoids (15 topics)
 - ◇ Identifying parallelograms, rectangles, and squares
 - ◇ Properties of quadrilaterals
 - ◇ Classifying parallelograms
 - ◇ Finding measures involving diagonals of parallelograms
 - ◇ 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
 - ◇ Proving that a quadrilateral with given vertices is a parallelogram
 - ◇ Classifying parallelograms in the coordinate plane
- Similarity (25 topics)
 - ◆ Ratios and Proportions (9 topics)
 - ◇ Writing ratios for real-world situations
 - ◇ Simplifying a ratio of whole numbers: Problem type 1
 - ◇ Solving a proportion of the form $x/a=b/c$: Basic
 - ◇ Solving a proportion of the form $x/a = b/c$
 - ◇ Solving a proportion of the form $(x+a)/b = c/d$
 - ◇ Solving a word problem on proportions using a unit rate
 - ◇ Word problem on proportions: Problem type 1
 - ◇ Finding a point that partitions a number line segment in a given ratio
 - ◇ Finding a point that partitions a segment in the plane in a given ratio
 - ◆ Similar Figures (7 topics)
 - ◇ Identifying similar or congruent shapes on a grid

- ◇ Finding angle measures of a triangle given two angles of a similar triangle
- ◇ Similar polygons
- ◇ Similar right triangles
- ◇ Indirect measurement
- ◇ Triangles and parallel lines
- ◇ Triangles and angle bisectors
- ◆ Proving Triangle Similarity (6 topics)
 - ◇ 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
 - ◇ Proving the slope criterion for parallel or perpendicular lines
- ◆ Scale Factors and Scale Drawings (3 topics)
 - ◇ Finding lengths using scale models
 - ◇ Finding a scale factor: Same units
 - ◇ Using a scale drawing to find actual area
- Right Triangles and Trigonometry (23 topics)
 - ◆ The Pythagorean Theorem (2 topics)
 - ◇ Word problem involving the Pythagorean Theorem
 - ◇ Identifying side lengths that give right triangles
 - ◆ Similar Right Triangles and Special Right Triangles (4 topics)
 - ◇ Identifying similar right triangles that overlap
 - ◇ Right triangles and geometric mean
 - ◇ Proving the Pythagorean Theorem using similar triangles
 - ◇ Special right triangles: Exact answers
 - ◆ Right Triangle Trigonometry (10 topics)
 - ◇ Sine, cosine, and tangent ratios: Numbers for side lengths
 - ◇ Using a calculator to approximate sine, cosine, and tangent values
 - ◇ 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
 - ◇ Using trigonometry to find a length in a word problem with one right triangle
 - ◇ Solving a 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
 - ◆ Laws of Sines and Cosines (7 topics)
 - ◇ Solving a triangle with the law of sines: Problem type 1
 - ◇ Solving a triangle with the law of sines: Problem type 2
 - ◇ Solving a word problem using the law of sines
 - ◇ Proving the law of sines
 - ◇ Solving a triangle with the law of cosines
 - ◇ Solving a word problem using the law of cosines
 - ◇ Proving the law of cosines
- Transformations (38 topics)
 - ◆ 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 (9 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
 - ◇ Finding the coordinates of a point reflected across an axis and translated
 - ◇ 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 (4 topics)
 - ◇ Drawing lines of symmetry
 - ◇ Finding an angle of rotation
 - ◇ Identifying rotational symmetry and angles of rotation
 - ◇ Rotational and point symmetries
- ◆ 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 (7 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
 - ◇ Dilating a figure
 - ◇ Writing a rule to describe a dilation
 - ◇ Exploring similarity of circles
 - ◇ Exploring the effect of dilation on lines
- Area and Volume (65 topics)
 - ◆ Areas of Parallelograms and Triangles (13 topics)
 - ◇ Area of a parallelogram
 - ◇ Finding the area of a right triangle on a grid
 - ◇ Finding the area of a right triangle or its corresponding rectangle
 - ◇ Area of a triangle
 - ◇ Finding the perimeter or area of a rectangle in the coordinate plane
 - ◇ Word problem on population density
 - ◇ 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
 - ◇ Finding the area of a right triangle using the Pythagorean Theorem
 - ◇ Area involving rectangles and triangles
 - ◇ 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
 - ◆ Areas of Trapezoids, Rhombi, and Kites (3 topics)

- ◇ Area of a trapezoid
- ◇ Area of a rhombus
- ◇ Finding the area of a trapezoid, rhombus, or kite in the coordinate plane
- ◆ Areas of Regular Polygons and Similar Polygons (3 topics)
 - ◇ Area of a regular polygon
 - ◇ Finding the area of a regular polygon using special right triangles
 - ◇ Side lengths, perimeters, and areas of similar polygons
- ◆ Circumferences and Areas of Circles (13 topics)
 - ◇ Introduction to a circle: Diameter, radius, and chord
 - ◇ Circumference of a circle
 - ◇ Informal argument for the formula of the circumference of a circle
 - ◇ Area of a circle
 - ◇ Circumference and area of a circle
 - ◇ Circumference and area of a circle: Exact answers in terms of π
 - ◇ Informal argument for the formula of the area of a circle
 - ◇ Area involving rectangles and circles
 - ◇ Area between two concentric circles
 - ◇ Area involving inscribed figures
 - ◇ Area involving multiple inscribed figures
 - ◇ Area of a sector of a circle: Exact answer in terms of π
 - ◇ Informal argument for the formula of the area of a sector
- ◆ Solids and Cross Sections (6 topics)
 - ◇ Classifying solids
 - ◇ Vertices, edges, and faces of a solid
 - ◇ Nets of solids
 - ◇ Identifying horizontal and vertical cross sections of solids
 - ◇ Identifying solids generated by rotations of two-dimensional regions
 - ◇ Identifying geometric shapes that model real-world objects
- ◆ Surface Areas of Prisms and Cylinders (4 topics)
 - ◇ Surface area of a cube or a rectangular prism
 - ◇ Using a net to find the surface area of a rectangular prism
 - ◇ Surface area of a triangular prism
 - ◇ Surface area of a cylinder
- ◆ Volumes of Prisms and Cylinders (15 topics)
 - ◇ Volume of a rectangular prism made of unit cubes
 - ◇ Volume of a rectangular prism
 - ◇ Distinguishing between surface area and volume
 - ◇ Volume of an oblique rectangular prism
 - ◇ Writing equivalent expressions for the volume of a rectangular prism
 - ◇ Word problem involving the volume of 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
 - ◇ Volume of a triangular prism
 - ◇ Volume of a cylinder
 - ◇ Informal argument for the formula of the volume of a cylinder
 - ◇ Volume of an oblique cylinder
 - ◇ Word problem involving the volume of a cylinder
 - ◇ Using cross sections to identify solids with the same volume
- ◆ Volumes of Pyramids and Cones (3 topics)
 - ◇ Volume of a pyramid
 - ◇ Volume of a cone
 - ◇ Informal argument for the formula of the volume of a cone

- ◆ Surface Areas and Volumes of Spheres (2 topics)
 - ◇ Surface area of a sphere
 - ◇ Volume of a sphere
- ◆ Similar Solids (3 topics)
 - ◇ Identifying similar solids
 - ◇ Computing ratios of side lengths, surface areas, and volumes for similar solids
 - ◇ Computing side length, surface area, and volume for similar solids
- Circles (31 topics)
 - ◆ Segments in a Circle and Tangent Lines (3 topics)
 - ◇ Identifying chords, secants, and tangents of a circle
 - ◇ Tangents of a circle: Problem type 1
 - ◇ Constructing a tangent of a circle
 - ◆ Chords and Arcs (5 topics)
 - ◇ Naming and finding measures of central angles, inscribed angles, and arcs of a circle
 - ◇ Applying properties of radii, diameters, and chords
 - ◇ Arc length
 - ◇ Arc length and area of a sector of a circle
 - ◇ Computing ratios of arc lengths to radii and describing the result
 - ◆ Inscribed Angles and Polygons (9 topics)
 - ◇ 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 an equilateral triangle or a regular hexagon in a circle
 - ◇ Inscribing a square in a circle
 - ◇ Inscribing a circle in a triangle
 - ◇ Circumscribing a circle about a triangle
 - ◆ Angle and Segment Relationships in Circles (2 topics)
 - ◇ Angles of intersecting secants and tangents
 - ◇ Lengths of chords, secants, and tangents
 - ◆ Graphs and Equations of Circles (7 topics)
 - ◇ Identifying the center and radius to graph a circle given its equation in standard form
 - ◇ Completing the square
 - ◇ Identifying the center and radius to graph a circle given its equation in general form: Basic
 - ◇ Writing the equation of a circle centered at the origin given its radius or a point on the circle
 - ◇ Writing an equation of a circle and identifying points that lie on the circle
 - ◇ Writing an equation of a circle given its center and radius or diameter
 - ◇ Deriving the equation of a circle using the Pythagorean Theorem
 - ◆ Graphs and Equations of Parabolas (5 topics)
 - ◇ Graphing a parabola of the form $y = ax^2$
 - ◇ Graphing a parabola of the form $y = ax^2 + c$
 - ◇ Finding the vertex, x-intercepts, and axis of symmetry from the graph of a parabola
 - ◇ Graphing a parabola of the form $y^2 = ax$ or $x^2 = ay$
 - ◇ Deriving the equation of a parabola given its focus and directrix
- Probability (32 topics)
 - ◆ Counting (8 topics)
 - ◇ Interpreting a Venn diagram of 3 sets
 - ◇ Introduction to the counting principle
 - ◇ Counting principle
 - ◇ Factorial expressions
 - ◇ Computing permutations and combinations
 - ◇ Introduction to permutations and combinations

- ◇ Permutations and combinations: Problem type 1
- ◇ Permutations and combinations: Problem type 2
- ◆ Theoretical and Experimental Probability (7 topics)
 - ◇ Determining a sample space and outcomes for a simple event
 - ◇ Determining a sample space and outcomes for a compound event
 - ◇ Introduction to the probability of an event
 - ◇ Probability of an event
 - ◇ Outcomes and event probability
 - ◇ Probabilities of a permutation and a combination
 - ◇ Area as probability
- ◆ Modeling Randomness and Simulations (1 topics)
 - ◇ Using a random number table to make a fair decision
- ◆ Two-Way Tables (3 topics)
 - ◇ Constructing a two-way frequency table: Basic
 - ◇ Constructing a two-way frequency table: Advanced
 - ◇ Computing a percentage from a table of values
- ◆ Probabilities of Independent and Dependent Events (10 topics)
 - ◇ Identifying independent events given descriptions of experiments
 - ◇ Probability of independent events
 - ◇ Probability of dependent events
 - ◇ Determining outcomes for compound events and complements of events
 - ◇ Using a Venn diagram to understand the multiplication rule for probability
 - ◇ Outcomes and event probability: Conditional probability
 - ◇ Identifying independent events given values of probabilities
 - ◇ Computing conditional probability using a two-way frequency table
 - ◇ Computing conditional probability to make an inference using a two-way frequency table
 - ◇ Conditional probability: Basic
- ◆ Probabilities of the Union of Two Events (3 topics)
 - ◇ Using a Venn diagram to understand the addition rule for probability
 - ◇ Outcomes and event probability: Addition rule
 - ◇ Probability of intersection or union: Word problems
- Other Topics Available(*) (242 additional topics)
 - ◆ Algebra Review (103 topics)
 - ◇ Order of operations with whole numbers and grouping symbols
 - ◇ Fractional position on a number line
 - ◇ Plotting fractions on a number line
 - ◇ Least common multiple of 3 numbers
 - ◇ Finding the LCD of two fractions
 - ◇ Addition and subtraction of 3 fractions with different denominators
 - ◇ Multiplication of 3 fractions
 - ◇ Writing an improper fraction as a mixed number
 - ◇ Writing a mixed number as an improper fraction
 - ◇ Addition of mixed numbers with different denominators and carry
 - ◇ Subtraction of mixed numbers with different denominators and borrowing
 - ◇ Addition and subtraction of 3 mixed numbers with different denominators
 - ◇ Mixed number multiplication
 - ◇ Multiplication of a mixed number and a whole number
 - ◇ Mixed number division
 - ◇ Division of a decimal by a power of ten
 - ◇ Plotting rational numbers on a number line
 - ◇ Signed fraction subtraction involving double negation

- ◇ Signed decimal addition and subtraction
- ◇ Finding all numbers with a given absolute value
- ◇ Distributive property: Fractional coefficients
- ◇ Additive property of equality with signed fractions
- ◇ Multiplicative property of equality with decimals
- ◇ Solving an equation to find the value of an expression
- ◇ Solving a multi-step equation given in fractional form
- ◇ Clearing fractions in an equation
- ◇ Solving a two-step equation with signed fractions
- ◇ Introduction to solving an absolute value equation
- ◇ Solving for a variable in terms of other variables using addition or subtraction: 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 percentages and decimals
- ◇ Using a calculator to convert a fraction to a rounded percentage
- ◇ Finding a percentage of a whole number without a calculator: Basic
- ◇ Finding a percentage of a whole number
- ◇ Applying the percent equation: Problem type 1
- ◇ 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 percentage increase or decrease: Basic
- ◇ Graphing a linear inequality on the number line
- ◇ Graphing a compound inequality on the number line
- ◇ Identifying solutions to a one-step linear inequality
- ◇ Multiplicative property of inequality with integers
- ◇ Multiplicative property of inequality with signed fractions
- ◇ Identifying solutions to a two-step linear inequality in one variable
- ◇ Solving a two-step linear inequality: Problem type 2
- ◇ Solving a two-step linear inequality with a fractional coefficient
- ◇ Introduction to the power of a power rule of exponents
- ◇ Introduction to the quotient rule of exponents
- ◇ Simplifying a ratio of univariate monomials
- ◇ Quotient of expressions involving exponents
- ◇ Introduction to the GCF of two monomials
- ◇ Factoring out a monomial from a polynomial: Univariate
- ◇ Factoring out a constant before factoring a quadratic
- ◇ Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- ◇ Square roots of perfect squares with signs
- ◇ Square roots of integers raised to even exponents
- ◇ Introduction to simplifying a radical expression with an even exponent
- ◇ Square root of a perfect square monomial
- ◇ Using absolute value to simplify square roots of perfect square monomials
- ◇ Cube root of an integer
- ◇ 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
- ◇ Rationalizing a denominator: Square root of a fraction
- ◇ Introduction to solving a radical equation
- ◇ Solving a radical equation that simplifies to a linear equation: One radical, basic
- ◇ Solving an equation of the form $x^3 = a$ using integers
- ◇ Solving an equation written in factored form
- ◇ Finding the roots of a quadratic equation of the form $ax^2 + bx = 0$
- ◇ Finding the roots of a quadratic equation with leading coefficient 1

- ◇ Finding the roots of a quadratic equation with leading coefficient greater than 1
- ◇ Solving a quadratic equation needing simplification
- ◇ Solving 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: Exact answers, basic
- ◇ Applying the quadratic formula: Exact answers
- ◇ Applying the quadratic formula: Decimal answers
- ◇ Perimeter of a polygon involving mixed numbers and fractions
- ◇ Perimeter of a piecewise rectangular figure
- ◇ Sides of polygons having the same perimeter
- ◇ Area of a rectangle involving fractions
- ◇ Area of a rectangle involving mixed numbers and fractions
- ◇ Estimates and exact answers
- ◇ Writing algebraic expressions for the area of a figure
- ◇ 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
- ◇ Word problem involving the area between two rectangles
- ◇ Measuring length to the nearest inch
- ◇ Measuring length to the nearest quarter or half inch
- ◇ U.S. Customary unit conversion with whole number values
- ◇ Conversions involving measurements in feet and inches
- ◇ Adding measurements in feet and inches
- ◇ U.S. Customary unit conversion with whole number values: Two-step conversion
- ◇ Measuring length to the nearest centimeter
- ◇ Measuring length to the nearest millimeter
- ◇ Metric distance conversion with whole number values
- ◇ Metric mass or capacity conversion with whole number values
- ◇ Metric distance conversion with decimal values
- ◇ Metric conversion with decimal values: Two-step problem
- ◇ Converting between metric and U.S. Customary unit systems
- ◇ U.S. Customary area unit conversion with whole number values
- ◇ Metric area unit conversion with decimal values
- ◆ Segments and Angles (13 topics)
 - ◇ Computing distances between decimals on a number line
 - ◇ 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
 - ◇ Plotting a point in the coordinate plane: Mixed number coordinates
 - ◇ 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
 - ◇ Using the Pythagorean Theorem to find distance on a grid
 - ◇ Distance between two points in the plane: Decimal answers
 - ◇ Finding an endpoint of a line segment given the other endpoint and the midpoint
 - ◇ Finding a point that partitions a segment in the plane in a given fractional relationship
 - ◇ Making conjectures given a geometric construction
- ◆ Reasoning (3 topics)
 - ◇ Finding the next terms of an arithmetic sequence with integers
 - ◇ Finding the next terms of a geometric sequence with signed numbers
 - ◇ Distinguishing between undefined terms, definitions, postulates, conjectures, and theorems
- ◆ Lines (23 topics)
 - ◇ Table for a linear function
 - ◇ Finding x- and y-intercepts of a line given the equation: Basic

- ◇ Finding x– and y–intercepts of a line given the equation: Advanced
- ◇ Graphing a line given its x– and y–intercepts
- ◇ Graphing a line by first finding its x– and y–intercepts
- ◇ Classifying slopes given graphs of lines
- ◇ Using right triangles to find the slope of a line
- ◇ Graphing a line given its slope and y–intercept
- ◇ Graphing a line through a given point with a given slope
- ◇ Rewriting a linear equation in the form $Ax + By = C$
- ◇ Graphing a line by first finding its slope and y–intercept
- ◇ Writing an equation and graphing a line given its slope and y–intercept
- ◇ Finding the slope 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 equation of the line through two given points
- ◇ Writing the equations of vertical and horizontal lines through a given point
- ◇ Identifying solutions to a system of linear equations
- ◇ Graphically solving a system of linear equations
- ◇ 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
- ◆ Triangles (8 topics)
 - ◇ Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
 - ◇ Establishing facts about the interior and exterior angles of a triangle
 - ◇ Creating triangles from given side lengths: Problem type 2
 - ◇ 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 conditions: Side lengths and angle measures
 - ◇ Drawing triangles with given side lengths using a compass
- ◆ Polygons and Quadrilaterals (2 topics)
 - ◇ Finding the number of sides of a regular polygon given the measure of an interior angle
 - ◇ Congruence in the coordinate plane
- ◆ Similarity (7 topics)
 - ◇ Writing ratios using different notations
 - ◇ Simplifying a ratio of decimals
 - ◇ Solving a proportion of the form $a/(x+b) = c/x$
 - ◇ Word problem on proportions: Problem type 2
 - ◇ Finding the coordinate that yields a given slope
 - ◇ Finding angle measures and side ratios to determine if two triangles are similar
 - ◇ Reproducing a scale drawing at a different scale
- ◆ Right Triangles and Trigonometry (16 topics)
 - ◇ Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle
 - ◇ Using the Pythagorean Theorem repeatedly
 - ◇ Demonstrating the converse of the Pythagorean Theorem
 - ◇ Special right triangles: Decimal answers
 - ◇ Sine, cosine, and tangent ratios: Variables for side lengths
 - ◇ Using the Pythagorean Theorem to find a trigonometric ratio
 - ◇ Finding trigonometric ratios given a right triangle
 - ◇ Translation of a vector
 - ◇ Multiplication of a vector by a scalar: Geometric approach
 - ◇ Magnitude of a vector given in component form
 - ◇ Vector addition and scalar multiplication: Component form

- ◇ Linear combination of vectors: Component form
- ◇ 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
- ◆ Transformations (8 topics)
 - ◇ Using a translated point to find coordinates of other translated points
 - ◇ Addition or subtraction of matrices
 - ◇ 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
 - ◇ The effect of dilation on area
 - ◇ Determining if figures are similar and related by a sequence of transformations
 - ◇ Scalar multiplication of a matrix
- ◆ Area and Volume (40 topics)
 - ◇ Computing an area using the Pythagorean Theorem
 - ◇ Informal proof of the Pythagorean Theorem
 - ◇ Finding an area in terms of variables
 - ◇ Heron's formula
 - ◇ Finding the area of a trapezoid on a grid by using triangles and rectangles
 - ◇ Finding the area of a rhombus using the Pythagorean Theorem
 - ◇ Finding the radius or the diameter of a circle given its circumference
 - ◇ Circumference ratios
 - ◇ Perimeter involving rectangles and circles
 - ◇ Distinguishing between the area and circumference of a circle
 - ◇ Word problem involving the area between two concentric circles
 - ◇ Circles inscribed in and circumscribed about regular polygons
 - ◇ Nets of solids: Advanced
 - ◇ Counting the cubes in a solid made of cubes
 - ◇ Side views of a solid made of cubes
 - ◇ Identifying properties of Euclidean and spherical geometries
 - ◇ Surface area of a rectangular prism made of unit cubes
 - ◇ Word problem involving the surface area of a rectangular prism
 - ◇ Surface area of a piecewise rectangular prism made of unit cubes
 - ◇ Using a net to find the surface area of a triangular prism
 - ◇ Surface area of a cylinder: Exact answers in terms of pi
 - ◇ Word problem involving the surface area of a cylinder
 - ◇ Word problem involving the surface area of rectangular prisms and cylinders
 - ◇ Word problem involving the surface area of rectangular prisms and pyramids
 - ◇ Volume of a solid made of cubes with unit fraction edge lengths
 - ◇ Volume of a rectangular prism with fractional edge lengths
 - ◇ Measuring the net of a solid to find surface area or volume
 - ◇ Finding the side length of a cube given its volume
 - ◇ Word problem involving the rate of filling or emptying a rectangular prism
 - ◇ Word problem involving the volume of a triangular prism
 - ◇ Word problem involving the rate of filling or emptying a cylinder
 - ◇ Word problem on density involving the volume of a cylindrical solid
 - ◇ Ratio of volumes
 - ◇ 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: Exact answers in terms of pi
 - ◇ Relating the volumes of a cylinder and a cone
 - ◇ Word problem involving the volume of a cone

- ◇ Word problem involving the volume of a sphere
- ◇ Word problem involving volumes of similar solids
- ◆ Circles (7 topics)
 - ◇ Tangents of a circle: Problem type 2
 - ◇ Angle measure in a circle graph
 - ◇ Converting between degree and radian measure: Problem type 1
 - ◇ Identifying the center and radius to graph a circle given its equation in general form: Advanced
 - ◇ Writing an equation of a circle given its center and a point on the circle
 - ◇ Writing an equation of a circle given the endpoints of a diameter
 - ◇ Graphing a parabola of the form $y = (x-h)^2 + k$
- ◆ Probability (12 topics)
 - ◇ Interpreting a tree diagram
 - ◇ Permutations, combinations, and the multiplication principle for counting
 - ◇ Experimental and theoretical probability
 - ◇ Probabilities involving two dice
 - ◇ Odds of an event
 - ◇ Identifying outcomes in a random number table used to simulate a compound event
 - ◇ Using a random number table to simulate a compound event
 - ◇ Introduction to expectation
 - ◇ Calculating relative frequencies in a contingency table
 - ◇ Probabilities of draws with replacement
 - ◇ Probabilities of draws without replacement
 - ◇ Probability of the union of two events

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.*