

Introduction to Geometry

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

Curriculum (211 topics + 6 additional topics)

- Algebra and Deductive Reasoning (47 topics)

- ◆ Numbers (21 topics)

- ◇ Order of operations with whole numbers
 - ◇ Order of operations with whole numbers and grouping symbols
 - ◇ Factors
 - ◇ Least common multiple of 2 numbers
 - ◇ Finding the next terms of a sequence with whole numbers
 - ◇ Equivalent fractions
 - ◇ Simplifying a fraction
 - ◇ Addition or subtraction of fractions with different denominators
 - ◇ Product of a fraction and a whole number: Problem type 1
 - ◇ Fraction multiplication
 - ◇ Fraction division
 - ◇ Writing ratios for real-world situations
 - ◇ Writing an improper fraction as a mixed number
 - ◇ Decimal place value: Hundreds to ten thousandths
 - ◇ Rounding decimals
 - ◇ Finding a percentage of a whole number without a calculator: Basic
 - ◇ Integer addition: Problem type 1
 - ◇ Integer addition: Problem type 2
 - ◇ Integer subtraction
 - ◇ Integer multiplication and division
 - ◇ Absolute value of a number

- ◆ Equations (17 topics)

- ◇ Evaluating a linear expression: Integer multiplication with addition or subtraction
 - ◇ Evaluating a quadratic expression: Integers
 - ◇ Translating a sentence into a one-step equation
 - ◇ Distributive property: Whole number coefficients
 - ◇ Combining like terms: Integer coefficients
 - ◇ Additive property of equality: Problem type 3
 - ◇ Multiplicative property of equality with signed fractions
 - ◇ Solving a two-step equation with integers
 - ◇ Solving a two-step equation with signed fractions
 - ◇ Solving a linear equation with several occurrences of the variable: Variables on the same side and distribution
 - ◇ Solving a linear inequality: Problem type 1
 - ◇ Graphing a linear inequality on the number line
 - ◇ Graphing a compound inequality on the number line
 - ◇ Solving a rational equation that simplifies to linear: Denominator x
 - ◇ Solving a proportion of the form $x/a = b/c$
 - ◇ Solving a proportion of the form $a/(x+b) = c/x$

- ◇ Word problem on proportions: Problem type 1
- ◆ Exponents and Radicals (4 topics)
 - ◇ Evaluating expressions with exponents: Problem type 1
 - ◇ Square root of a perfect square
 - ◇ Simplifying the square root of a whole number less than 100
 - ◇ Rationalizing the denominator of a radical expression
- ◆ Deductive Reasoning (5 topics)
 - ◇ Interpreting a Venn diagram of 2 sets
 - ◇ Interpreting a Venn diagram of 3 sets
 - ◇ Conditional statements and negations
 - ◇ The converse, inverse, and contrapositive of a conditional statement
 - ◇ Conditional statements and deductive reasoning
- Lines and Angles (26 topics)
 - ◆ Segments (7 topics)
 - ◇ Naming segments, rays, and lines
 - ◇ Measuring length to the nearest quarter or half inch
 - ◇ Computing distances between decimals on the number line
 - ◇ Midpoint of a number line segment
 - ◇ Segment addition and midpoints
 - ◇ Introduction to proofs: Justifying statements
 - ◇ Proofs involving segment congruence
 - ◆ Lines (6 topics)
 - ◇ Identifying parallel and perpendicular lines
 - ◇ Constructing the perpendicular bisector of a line segment
 - ◇ Constructing a pair of perpendicular lines
 - ◇ Constructing a pair of parallel lines
 - ◇ Introduction to proofs involving parallel lines
 - ◇ Proofs involving parallel lines
 - ◆ Angles (13 topics)
 - ◇ Measuring an angle with the protractor
 - ◇ Drawing an angle with the protractor
 - ◇ Acute, obtuse, and right angles
 - ◇ Finding supplementary and complementary angles
 - ◇ Identifying corresponding and alternate angles
 - ◇ Identifying linear pairs and vertical angles
 - ◇ Solving equations involving vertical angles and linear pairs
 - ◇ Solving equations involving angles and two pairs of parallel lines
 - ◇ Constructing congruent angles
 - ◇ Constructing an angle bisector
 - ◇ Angle addition with relationships between angles
 - ◇ Angle addition and angle bisectors
 - ◇ Proofs involving angle congruence
- Triangles (29 topics)
 - ◆ Properties of Triangles (14 topics)
 - ◇ Acute, obtuse, and right triangles
 - ◇ Classifying scalene, isosceles, and equilateral triangles by side lengths or angles
 - ◇ Area of a triangle
 - ◇ Finding an angle measure of a triangle given two angles
 - ◇ Finding an angle measure given extended triangles
 - ◇ Finding an angle measure given a triangle and parallel lines
 - ◇ Finding angle measures of a right or isosceles triangle given angles with variables
 - ◇ Finding an angle measure for a triangle with an extended side
 - ◇ Finding an angle measure for a triangle sharing a side with another triangle

- ◇ Using triangle inequality to determine if side lengths form a triangle
- ◇ Using triangle inequality to determine possible lengths of a third side
- ◇ Relationship between angle measures and side lengths in a triangle
- ◇ Relationship between angle measures and side lengths in two triangles
- ◇ Indirect proof (proof by contradiction)
- ◆ Congruent Triangles (6 topics)
 - ◇ Identifying and naming congruent triangles
 - ◇ Proofs involving congruent triangles and vertical angles or the reflexive property
 - ◇ Proofs involving congruent triangles and segment or angle bisectors
 - ◇ Proofs involving congruent triangles that overlap: Basic
 - ◇ Proofs involving congruent triangles, parallel or perpendicular segments, and CPCTC
 - ◇ Proofs involving congruent triangles that overlap: Advanced
- ◆ Right Triangles (4 topics)
 - ◇ Pythagorean Theorem
 - ◇ Computing an area using the Pythagorean Theorem
 - ◇ Special right triangles: Exact answers
 - ◇ Circles inscribed in and circumscribed about regular polygons
- ◆ Trigonometric Ratios (5 topics)
 - ◇ Sine, cosine, and tangent ratios: Variables for side lengths
 - ◇ Using a trigonometric ratio to find a side length in a right triangle
 - ◇ Using trigonometry to find a length in a word problem with one right triangle
 - ◇ Using a trigonometric ratio to find an angle measure in a right triangle
 - ◇ Using trigonometry to find angles of elevation or depression in a word problem
- Polygons and Circles (43 topics)
 - ◆ Polygons and Quadrilaterals (9 topics)
 - ◇ Properties of quadrilaterals
 - ◇ Conditions for quadrilaterals
 - ◇ Classifying parallelograms
 - ◇ Finding measures involving diagonals of parallelograms
 - ◇ Conditions for parallelograms
 - ◇ Finding measures involving diagonals of rectangles
 - ◇ Finding measures involving diagonals of rhombi
 - ◇ The sum of interior angle measures in a convex polygon
 - ◇ Interior and exterior angle measures in a regular polygon
 - ◆ Perimeters and Areas of Polygons (16 topics)
 - ◇ Perimeter of a polygon
 - ◇ Perimeter of a square or a rectangle
 - ◇ Perimeter of a piecewise rectangular figure
 - ◇ Sides of polygons having the same perimeter
 - ◇ Finding a side length given the perimeter and side lengths with variables
 - ◇ Area of a square or a rectangle
 - ◇ Distinguishing between the area and perimeter of a rectangle
 - ◇ Areas of rectangles with the same perimeter
 - ◇ Area of a piecewise rectangular figure
 - ◇ Finding the side length of a rectangle given its perimeter or area
 - ◇ Finding the perimeter or area of a rectangle given one of these values
 - ◇ Area of a parallelogram
 - ◇ Area of a trapezoid
 - ◇ Word problem involving the area between two rectangles
 - ◇ Area involving rectangles and triangles
 - ◇ Area of a regular polygon
 - ◆ Circles (9 topics)
 - ◇ Introduction to a circle: Diameter, radius, and chord

- ◊ Identifying central angles, inscribed angles, arcs, chords, and tangents of a circle
- ◊ Tangents of a circle: Problem type 1
- ◊ Tangents of a circle: Problem type 2
- ◊ Lengths of chords, secants, and tangents
- ◊ Inscribed angles of a circle
- ◊ Central angles and inscribed angles of a circle
- ◊ Angles of intersecting secants and tangents
- ◊ Angle measure in a circle graph
- ◆ Circumferences and Areas of Circles (9 topics)
 - ◊ Finding the radius or the diameter of a circle given its circumference
 - ◊ Circumference and area of a circle
 - ◊ Perimeter involving rectangles and circles
 - ◊ Circumference ratios
 - ◊ Arc length and area of a sector of a circle
 - ◊ Word problem involving the area between two concentric circles
 - ◊ Area involving rectangles and circles
 - ◊ Area involving rectangles and circles: Advanced problem
 - ◊ Area as probability
- Similarities and Transformations (19 topics)
 - ◆ Similarities (9 topics)
 - ◊ Identifying congruent shapes on a grid
 - ◊ Identifying similar or congruent shapes on a grid
 - ◊ Similar polygons
 - ◊ Triangles and parallel lines
 - ◊ Similar right triangles
 - ◊ Right triangles and geometric mean
 - ◊ Indirect measurement
 - ◊ Computing ratios of side lengths, surface areas, and volumes for similar solids
 - ◊ Similar solids: Problem type 2
 - ◆ Transformations (10 topics)
 - ◊ Identifying transformations
 - ◊ Translating a polygon
 - ◊ Using a translated point to find coordinates of other translated points
 - ◊ Reflecting a polygon over a vertical or horizontal line
 - ◊ Finding the coordinates of three points reflected over an axis
 - ◊ Drawing lines of symmetry
 - ◊ Rotating a figure about the origin
 - ◊ Finding an angle of rotation
 - ◊ Rotational and point symmetries
 - ◊ Dilating a figure
- Volumes and Surface Areas (20 topics)
 - ◆ Volumes (11 topics)
 - ◊ Counting the cubes in a solid made of cubes
 - ◊ Volume of a rectangular prism made of unit cubes
 - ◊ Volume of a rectangular prism
 - ◊ Volume of a piecewise rectangular prism
 - ◊ Volume of a triangular prism
 - ◊ Volume of a pyramid
 - ◊ Volume of a cylinder
 - ◊ Volume of a cone: Exact answers in terms of pi
 - ◊ Volume of a sphere
 - ◊ Word problem involving the rate of filling or emptying a cylinder
 - ◊ Ratio of volumes

- ◆ Surface Areas (9 topics)
 - ◇ Vertices, edges, and faces of a solid
 - ◇ Nets of solids
 - ◇ Side views of a solid made of cubes
 - ◇ Surface area of a piecewise rectangular prism made of unit cubes
 - ◇ Surface area of a cube or a rectangular prism
 - ◇ Surface area of a triangular prism
 - ◇ Surface area of a cylinder: Exact answers in terms of pi
 - ◇ Surface area involving prisms or cylinders
 - ◇ Surface area of a sphere
- Coordinate Geometry (27 topics)
 - ◆ Coordinate Plane (6 topics)
 - ◇ Plotting a point in the coordinate plane
 - ◇ Midpoint of a line segment in the plane
 - ◇ Distance between two points in the plane: Exact answers
 - ◇ Finding coordinates of vertices of polygons
 - ◇ Finding the coordinates of a point to make a parallelogram
 - ◇ Area of quadrilaterals in the coordinate plane
 - ◆ Equations of Lines (12 topics)
 - ◇ Graphing a line given its x- and y-intercepts
 - ◇ Graphing a line given its equation in slope-intercept form
 - ◇ Finding x- and y-intercepts of a line given the equation: Advanced
 - ◇ Graphing a line given its equation in standard form
 - ◇ Graphing a line through a given point with a given slope
 - ◇ Determining the slope of a line given its graph
 - ◇ Finding the slope of a line given its equation
 - ◇ Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
 - ◇ Writing equations of lines parallel and perpendicular to a given line through a point
 - ◇ Writing an equation of a line given the y-intercept and another point
 - ◇ Writing the equation of a line given the slope and a point on the line
 - ◇ Writing the equation of the line through two given points
 - ◆ Equations of Circles (3 topics)
 - ◇ Graphing a circle given its equation in standard form
 - ◇ 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
 - ◆ Vectors (6 topics)
 - ◇ Scalar multiplication of a vector: Geometric Approach
 - ◇ Vector addition: Geometric approach
 - ◇ Vector addition and scalar multiplication: Component form
 - ◇ Magnitude of a vector given in component form
 - ◇ Finding the magnitude and direction of a vector given its graph
 - ◇ Finding the components of a vector given its graph
- Other Topics Available(*) (6 additional topics)
 - ◆ Triangles (3 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 triangle with the law of cosines
 - ◆ Coordinate Geometry (3 topics)
 - ◇ Translation of a vector
 - ◇ Addition or subtraction of matrices
 - ◇ Scalar multiplication of a matrix

***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.*