ALEKS[®]

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 Show All (211 topics + 6 additional topics)

- Algebra and Deductive Reasoning (47 topics)
 - ♦ Numbers (21 topics)
 - \diamond 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
- \Diamond Product of a fraction and a whole number: Problem type 1
- ♦ Fraction multiplication
- ♦ Fraction division
- **◊** Writing ratios for real–world situations
- **Over the set of the s**
- ◊ 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
- \Diamond Integer subtraction
- ◊ Integer multiplication and division
- ♦ Absolute value of a number
- ♦ Equations (17 topics)
 - **\Diamond** 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
 - \diamond Solving a proportion of the form x/a = b/c
 - \Diamond Solving a proportion of the form a/(x+b) = c/x
 - **& Word problem on proportions: Problem type 1**

- Exponents and Radicals (4 topics)
 - \diamond 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
 - \Diamond Interpreting a Venn diagram of 3 sets
 - \Diamond Conditional statements and negations
 - \Diamond The converse, inverse, and contrapositive of a conditional statement
 - \Diamond Conditional statements and deductive reasoning
- Lines and Angles (26 topics)
 - ♦ Segments (7 topics)
 - \Diamond Naming segments, rays, and lines
 - \diamond Measuring the length of an object 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
 - Onstructing the perpendicular bisector of a line segment
 - Onstructing 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
 - \diamond 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
 - Onstructing congruent angles
 - \Diamond 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
 - **Olassifying scalene**, isosceles, and equilateral triangles by side lengths or angles
 - ♦ Area of a triangle
 - \Diamond 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
 - \Diamond Finding an angle measure for a triangle sharing a side with another triangle
 - ◊ Using triangle inequality to determine if side lengths form a triangle

 \Diamond Using triangle inequality to determine possible lengths of a third side

- \Diamond 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
 - **OProofs involving congruent triangles and vertical angles or the reflexive property**
 - \Diamond Proofs involving congruent triangles and segment or angle bisectors
 - \Diamond Proofs involving congruent triangles that overlap: Basic
 - **OPROOF** Proofs involving congruent triangles, parallel or perpendicular segments, and CPCTC
 - \Diamond Proofs involving congruent triangles that overlap: Advanced
- Right Triangles (4 topics)
 - \Diamond Pythagorean Theorem
 - \Diamond Computing an area using the Pythagorean Theorem
 - ◊ Special right triangles: Exact answers
 - ◊ Circles inscribed in and circumscribed about regular polygons
- ◆ Trigonometric Ratios (5 topics)
 - \Diamond Sine, cosine, and tangent ratios: Variables for side lengths
 - \Diamond Using a trigonometric ratio to find a side length in a right triangle
 - \Diamond Using trigonometry to find a length in a word problem with one right triangle
 - \Diamond 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
 - \Diamond Conditions for quadrilaterals
 - ◊ Classifying parallelograms
 - ◊ Finding measures involving diagonals of parallelograms
 - \Diamond Conditions for parallelograms
 - Inding measures involving diagonals of rectangles
 - ◊ Finding measures involving diagonals of rhombi
 - \Diamond 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
 - \Diamond 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
 - \Diamond Word problem involving the area between two rectangles
 - ◊ Area involving rectangles and triangles
 - ♦ Area of a regular polygon
 - ♦ Circles (9 topics)
 - \Diamond 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

Or Circumference ratios

 \Diamond 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

Organization Organization 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

 \Diamond 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

 \Diamond 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

 \Diamond Surface area of a sphere

- Coordinate Geometry (27 topics)
 - ◆ Coordinate Plane (6 topics)

 \Diamond 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

 \Diamond Graphing a line given its equation in slope–intercept form

♦ Finding x- and y-intercepts of a line given the equation: Advanced

 \Diamond 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

 \Diamond Finding the slope of a line given its equation

 \diamond Finding slopes of lines parallel and perpendicular to a line given in the form Ax + By = C

O Writing equations of lines parallel and perpendicular to a given line through a point

◊ Writing the equation of a line given the y−intercept and another point

O Writing the equation of a line given the slope and a point on the line

Vriting the equation of a line through two given points

• Equations of Circles (3 topics)

◊ Graphing a circle given its equation in standard form

O 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

 \Diamond 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)

 \Diamond Solving a triangle with the law of sines: Problem type 1

♦ Solving a triangle with the law of sines: Problem type 2

 \Diamond 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.