

# Geometry Mathematics Content Standard

## *Students will...*

- 1.0 Understand undefined terms, axioms, theorems, and inductive and deductive reasoning.
- 2.0 Write geometric proofs, including proofs by contradiction.
- 3.0 Construct and judge the validity of a logical argument; use counterexamples to disprove a statement.
- 4.0 Prove basic theorems involving congruence and similarity.
- 5.0 Prove that triangles are congruent or similar, and utilize the concept of corresponding parts.
- 6.0 Know and be able to use the triangle inequality theorem.
- 7.0 Prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.
- 8.0 Derive and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.
- 9.0 Compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and memorize the formulas for prisms, pyramids, and cylinders.
- 10.0 Compute the areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.
- 11.0 Determine how changes in dimensions affect perimeter, area, and volume of geometric figures/solids.
- 12.0 Find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.
- 13.0 Prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.
- 14.0 Prove the Pythagorean Theorem.
- 15.0 Use the Pythagorean Theorem to determine distance and find lengths of sides of right triangles.
- 16.0 Perform basic constructions with a straightedge and compass.
- 17.0 Prove theorems by using coordinate geometry.
- 18.0 Know the definitions of the basic trigonometric functions defined by the angles of a right triangle.
- 19.0 Use trigonometric functions to solve for the sides and angles of a triangle.
- 20.0 Know and be able to use angle and side relationships in special 30-60-90 and 45-45-90 triangles.
- 21.0 Prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
- 22.0 Know the effect of transformations on figures in the coordinate plane and space, including rotations, translations, and reflections.