

Geometry

- ✚ Demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning
- ✚ Write geometric proofs, including proofs by contradiction
- ✚ Construct and judge the validity of a logical argument and give counterexamples to disprove a statement
- ✚ Prove basic theorems involving congruence and similarity
- ✚ Prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles
- ✚ Know and are able to use the triangle inequality theorem
- ✚ Prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles
- ✚ Know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures
- ✚ Compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders
- ✚ Compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids
- ✚ Determine how changes in dimensions affect the perimeter, area, and volume of common
- ✚ Prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles
- ✚ Prove the Pythagorean theorem and use it to Determine distance and find missing lengths of sides of right triangles
- ✚ Perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line
- ✚ Prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles
- ✚ Find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems
- ✚ Know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them. For example, $\tan(x) = \sin(x)/\cos(x)$, $\sin^2(x) + \cos^2(x) = 1$
- ✚ Use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side
- ✚ Know and are able to use angle and side relationships in problems with special right triangles, such as 30° , 60° , and 90° triangles and 45° , 45° , and 90° triangles
- ✚ Prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles
- ✚ Know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections