



**RADNOR TOWNSHIP SCHOOL DISTRICT**  
**Course Overview**  
Advanced Geometry- Grades 9,10



### **General Information**

Prerequisite: Advanced Algebra 1 or 8th grade

Length: Full Year

Format: meets daily for one period

### **Course Description**

This course is a concept-based approach to traditional Geometry designed to reinforce and extend previous algebra skills while integrating new geometric concepts. Students in Advanced Geometry derive and use formulas for perimeter, circumference, area, surface area, and volume of many types of figures use the Pythagorean Theorem, use congruence and similarity in describing relationships between figures and analyze geometric figures. Some computer lab work may be performed during the year. Throughout the course, algebra skills will be reviewed and reinforced through the application of geometric concepts.

Advanced Geometry is a College Preparatory level which features moderate pacing and workload with teacher guidance to assist in the mastery of the material. Students enrolled on this level should be seeking to satisfy college requirements/expectations of mathematics course but not necessarily have an interest in pursuing math related college majors.

### **Course Objectives:**

- Sketch intersection of a line and a plane
- Use segment postulate and distance formula
- Classify angles
- Bisect a segment and an angle
- Identify vertical angles, linear pair, complementary and supplementary angles
- Find the perimeter, circumference and area of plane figures
- Recognize and analyze conditional statements and write their inverses, converses and contrapositives
- Recognize and use biconditional statements for definitions
- Identify relationships between lines
- Identify angles formed by coplanar lines intersected by a transversal
- Use slopes to decide if lines are parallel or perpendicular
- Write the equation of a line parallel or perpendicular to a given line
- Classify triangles by their sides and angles
- Find angle measures in triangles
- Identify congruent figures and corresponding parts
- Prove triangles are congruent using SSS, SAS, ASA, AAS and HL
- Use properties of perpendicular bisector of segments and angle bisectors
- Use properties of medians, altitudes midsegment of triangles
- Compare the lengths of the sides or the measures of the angles of a triangle
- Identify, name and describe polygons
- Use the sum of the measures of the interior angles of a quadrilateral
- Use properties of parallelograms
- Prove that a quadrilateral is a parallelogram
- Use properties of rhombi, rectangles and squares including properties of diagonals
- Use properties of trapezoids and kites
- Identify special types of quadrilaterals based on limited information
  - Find the area of rectangles, kites, parallelograms, squares, triangles, trapezoids and rhombi
- Write and simplify the ratio of two numbers

- Use proportion to solve problems
- Understand the properties of proportions
- Identify similar polygons and use properties of similar polygons
- Prove that two triangles are similar using AA, SSS or SAS similarity theorem
- Use similarity theorems to solve problems
- Use the Pythagorean theorem and its converse
- Use side lengths to classify triangle
- Find side lengths of special right triangles
- Find trigonometric ratios of an acute angle of a right triangle
- Solve a right triangle

**Common Assessments:**

Assignment sheets will be distributed periodically throughout the school year. Homework will be assigned on a daily basis. Grades will be based on quizzes and tests. In addition, teachers may use homework, group activities, and/or projects for grading purposes. All students will take departmental midyear and final exams. The Radnor High School grading system and scale will be used to determine letter grades.

Homework: All assignment sheets for this course can be found on the math department website.

**Major Units of Study:**

- I. Basic Ideas of Geometry
- II. Parallel Lines and Planes
- III. Transformations
- IV. Congruent Triangles
- V. Constructions
- VI. Using Congruent Triangles and Parallel Lines
- VII. Similarity
- VIII. Right Triangles
- IX. Coordinate Geometry
- X. Circles
- XI. Area and Perimeter of Polygons
- XII. Surface Area and Volume

**Materials & Texts**

**MATERIALS**

Graphing and/or scientific calculator

Compass and straight edge

Classzone: <http://www.classzone.com/books/geometry/index.cfm?state=PA>

**TEXTS**

Geometry; McDougal & Littell, ©2001

**Summer Assignment**