



## Geometry

### **Course Instructor & Professional Biography**

**Course Instructor:** Mrs. Susan E. Profeta

Mrs. Profeta graduated from the University of Pittsburgh with both a Bachelor's and Master's Degree in Electrical Engineering. She began her professional career working for Westinghouse followed by Alcoa as a Control Engineer. After taking time off to raise her three children, she returned to La Roche College where she earned her third degree in Secondary Education. She taught at Fox Chapel Area School District and La Roche College before joining the North Catholic team in August 2015.

### **Course Description**

Geometry meets the Pennsylvania State Standards. This course offers the basics of Euclidean Geometry. Students will study plane figures: triangles, quadrilaterals, and other polygons. The course will cover both inductive and deductive logic, 2-column and paragraph proofs, congruence, and similarity. Particular emphasis will be given to triangles. Emphasis will also be placed on coordinate geometry. Course requires successful completion of Algebra I.

### **Course Resources**

Textbook – Geometry Common Core by Charles, Hall, Kennedy, Bass, Johnson, Murphy, and Wiggins

Three-ring binder with dividers for 3 sections

Graphing calculator: recommend is the Texas Instruments 84+ graphing calculator\*

Index cards and (erasable) highlighters are strongly recommended

### **Course Units by Sequence**

- The Tools of Geometry
- Reasoning and Proof
- Parallel and Perpendicular Lines
- Congruent Triangles
- Similarity in Triangles
- Polygons and Quadrilaterals
- Circles
- Area and Volume

## End of Course Outcomes

Upon completion of the Course, the Students will be able to:

- Use and understand the basic terms of geometry
- Use and apply properties of segments, angles, and polygons
- Use properties of similarity, correspondence and congruence
- Work through basic proofs and demonstrate understanding of deductive thinking
- Use algebraic representations to solve geometry-based problems
- Identify and use parts of circles and segments associated with circles, spheres and cylinders
- Identify, create and solve practical problems involving right triangles using the Pythagorean theorem

### Major Subject Area Academic Standards Addressed

#### COMMON CORE Standards:

HSN-Q.A.1: Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

HSG-CO.A.1: Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

HSG-CO.C.9: Prove theorems about lines and angles.

HSG-CO.C.10: Prove theorems about triangles.

HSG-CO.C.11: Prove theorems about parallelograms.

HSG-CO.D.12: Make formal geometric constructions with a variety of tools and methods

HSG-CO.D.13: Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

HSG-GPE.A.1: Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

HSG-GPE.B.4 Use coordinates to prove simple geometric theorems algebraically.

HSG-GPE.B.5: Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems

HSG-GPE.B.6: Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

HSG-GPE.B.7: Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.

HSG-MG.A.1: Use geometric shapes, their measures, and their properties to describe objects

HSG-MG.A.2: Use geometric shapes, their measures, and their properties to describe objects

HSG-MG.A.3: Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

HSG-SRT.B.4: Prove theorems about triangles

HSG-SRT.B.5: Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

HSG-SRT.B.7: Use coordinates to compute perimeters of polygons and areas of triangles and rectangles.

HSG-SRT.C.6: Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

HSG-SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

HSG-C.A.1: Prove that all circles are similar.

HSG-C.A.2: Identify and describe relationships among inscribed angles, radii, and chords.

HSG-C.A.3: Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.

HSG-C.B.5: Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

HSG-GMD.A.1: Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.

HSG-GMD.A.2: Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

HSG-GMD.A.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

HSG-GMD.B.4: Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

## Student Assessments

Tests:

- Each covers the material from one or more chapters.
- May be in-class or take home and may be individual or group, or combinations of those formats.
- Can be multiple-choice, matching, true-false, short answer, completion, essay or problem solving.

Quizzes:

- May take place several times over the course of a chapter.
- May be announced or unannounced.
- Can be multiple-choice, matching, true-false, short answer, completion, essay, or problems solving.
- May be closed or open notebook quizzes.

Homework

- Will be given regularly – expect it every night
- Will usually be spot-checked for completeness but may be collected and graded for accuracy.

Notebook

- Each student will need a three-ring binder with notebook paper and dividers for 3 sections. **Required** notebook sections will include notes, homework, and definitions/theorems/postulates. Learning to take and organize good notes is an invaluable part of preparing for college.
- All class work will be dated and put in order in the binder.
- Several times during a quarter or semester a notebook check or notebook quiz may occur.

Midterm/Final Exam

- Cumulative exams focusing on material covered in the previous semester(s)
- May be comprised of multiple choice, true-false, short answer and problem-solving questions

## Grading

You will be evaluated on numerous items including, but not limited to, the following: class notes, homework, worksheets, in-class assignments, quizzes, projects, tests, midterms, and final exams. Point values for each item will vary. Homework will be worth 20% of the grade each quarter; exams (consisting of tests, quizzes, and projects) will be worth 80% of the grade each quarter. Midterms and Finals are graded per the school wide policy. The course grading scale is based upon the school wide grading scale.

A – 93-100%   B – 85-92%   C – 75-84%   D – 70-74%   F – below 70%

## Mastery Learning

A goal of the class is to gain mastery of the material covered. As such, students will be permitted to retake one (1) test per quarter where the student scored below a 75%. The exam may be retaken only once; the retake score will replace the original test score, regardless if it is higher or lower, and will not exceed 75%. The request for a retake must be made within one week of the original test date and/or as announced by the instructor. Before retaking a test, the student must complete some form of remediation, as determined by the instructor. This may vary depending on the nature and topic of the test. The remediation must be completed by an agreed-upon date (specified in the Retake Request form) and must be both complete and correct in order to qualify for a retake exam. Bonus opportunities will NOT be available on test retakes. The mastery learning policy does not apply to any grade penalized by cheating or unethical behavior. The mastery learning policy does not apply to Midterms and Finals.

**\*Calculator Note:** North Catholic High School **requires** all students to purchase a graphing calculator. We believe this is an essential learning tool which allows our students think about math in a more critical way and helps students make connections between math concepts.

The graphing calculator that we will be modeling during our lessons and that we recommend for all students is the Texas Instruments 84+ graphing calculator. More expensive upgraded versions are completely optional. If you select an upgraded version, it is your responsibility to check with the College Board's (or other test administrator's) latest calculator requirements to ensure that your model will be allowed on the SAT, ACT or other tests that you may consider. The current SAT calculator policy can be found at <https://collegereadiness.collegeboard.org/sat/taking-the-test/calculator-policy>, the AP calculator policy can be found at <https://apstudents.collegeboard.org/exam-policies-guidelines/calculator-policies>, and the ACT calculator policy can be found at <http://www.act.org/content/dam/act/unsecured/documents/ACT-calculator-policy.pdf>.

## **Contact Information**

*North Catholic High School*  
1617 Route 228  
Cranberry TWP. PA 16066  
[sprofeta@northcatholic.org](mailto:sprofeta@northcatholic.org)

*Please complete and return this page by Friday, August 23<sup>rd</sup>.*



*I have read and understand the rules and policies presented in Mrs. Profeta's Geometry Syllabus document and Classroom Rules document.*

*Rules and policies are subject to change at the discretion of the teacher.*

Student Name: (print) \_\_\_\_\_ Period: \_\_\_\_\_

Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent Signature: \_\_\_\_\_ Date: \_\_\_\_\_