📘 Geometry Honors Syllabus

Ms. Amy Ganaden

I***n this course, students will learn logical reasoning, how to understand and apply geometric relationships, how to use algebra in geometry, and have an understanding of measurement and spatial reasoning. With it being an honors course, we will dive deep into each concept and work well beyond the essential skills.***

Supplies needed daily: Book (issued), a notebook to hold note pages & assessments, pencil, paper (graph or regular) and a TI-30X calculator

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✏️ Assessments

- Unit tests and quizzes (points vary)
- Homework assignments (3 points for completion and effort)
- Projects (50 points) - One per semester
- Final exams (15% of total grade each semester)

Motto: Restore all things in Christ!

Mission: St. Pius X School builds a foundation in faith, academic excellence, and lifelong learning, partnering with families to enhance Catholic morals and authentic truth for the greater glory of God.

Units of Study

Basics of Geometry

- Points, lines, planes
- Line segments and rays
- Measuring and classifying angles
- Angle pair relationships (complementary, supplementary, vertical, adjacent)
- Distance and midpoint formulas
- Basic constructions

Reasoning and Proof

- Inductive vs. deductive reasoning
- Conditional statements (if-then)
- Converse, inverse, contrapositive
- Logic and truth tables
- Properties of equality and congruence
- Writing two-column and paragraph proofs

Parallel and Perpendicular Lines

- Properties of parallel lines
- Transversals and angle relationships
- Proving lines parallel
- Slopes of lines
- Perpendicular lines and equations

Congruent Triangles

- Classifying triangles
- Triangle angle sum theorem
  Exterior angle theorem
- SSS, SAS, ASA, AAS, HL congruence
- Using congruent triangles in proofs

Relationships in Triangles

- Triangle inequalities
- Medians, altitudes, perpendicular bisectors, angle bisectors
- Centroid, incenter, circumcenter, orthocenter
- Midsegment theorem

Quadrilaterals and Polygons

- Properties of polygons
- Interior and exterior angle sums
- Parallelograms, rectangles, rhombi, squares
- Trapezoids and kites
- Coordinate proofs

Similarity

- Ratios and proportions
- Similar polygons
- AA, SSS, SAS similarity theorems
- Applications of similarity (indirect measurement, scale models)

Right Triangles and Trigonometry

- Pythagorean Theorem
- Special right triangles (30-60-90 and 45-45-90)
- Trigonometric ratios (sine, cosine, tangent)
- Solving right triangles
- Applications of trigonometry

Circles

- Parts of a circle (radius, diameter, chord, arc, sector, etc.)
- Central and inscribed angles
- Arc length and area of a sector
- Tangents, secants, chords
- Circle equations and graphs

Area, Surface Area, and Volume

- Area of 2D shapes: triangles, quadrilaterals, circles
- Surface area and volume of 3D solids: prisms, cylinders, pyramids, cones, spheres
- Composite figures
- Geometric probability
- Symmetry (line and rotational)
- Congruence and similarity through transformations