Honors Geometry

I. Points, Lines, Segments, Rays, Angles, and Planes
- A. Undefined Terms and Basic Definitions
- B. Special Pairs of Angles
- C. Describe Points and Lines with Coordinate Geometry
- D. Distance Formula
- E. Basic Constructions

II. Reasoning and Logic
- A. Conditional or "If-then" Statements and "If and only if" Statements
- B. Conjectures
- C. Related Conditionals – Converse, Inverse, and Contrapositive
- D. Examples of Real Life Inductive and Deductive Reasoning
- E. Planning a Proof and Proving Theorems
- F. Indirect Proof
- G. Counterexamples
- H. Variety of Problem-Solving Activities
- I. Reasonable Solutions

III. Parallel Lines and Planes
- A. Properties of Parallel Lines and Planes
- B. Proving Lines and Planes Parallel

IV. Triangles
- A. Identifying Different Types of Triangles
- B. Proving Triangles Congruent
- C. Corresponding Parts in a Congruence
- D. Medians, Altitudes and Perpendicular Bisectors
- E. Congruent Triangle Constructions
- F. Length and Area Problems with Congruence and Similarity
- G. Theorems Involving Segments Divided Proportionally
- H. Prove Triangle Regularity, Congruence, and Similarity with Coordinate Geometry
- I. Perimeters and Areas
- J. Inequality Theorems

V. Quadrilaterals
- A. Describe, Classify, and Understand Relationships for All Quadrilaterals
- B. Solve Length and Area Problems Using Congruent and Similar Quadrilaterals
- C. Perimeters and Areas
- D. Prove Properties of Quadrilaterals with Coordinate Geometry

VI. Polygons
- A. Angles in Polygons
- B. Convex, Concave, and Regular

C. Problems with Properties of Congruent and Similar Polygons
D. Perimeters and Areas
E. Various Transformations
F. Prove Properties of Polygons like Regularity, Congruence, and Similarity with Coordinate Geometry

VII. Right Triangles
A. Word Problems Involving Right Triangles
B. Pythagorean Theorem and its Converse
C. Geometric Mean
D. Special Right Triangles
E. Tangent, Sine, and Cosine Ratios
F. $\sin^2(x) + \cos^2(x) = 1$

VIII. Circles
A. Find the Center of a Circle Using a Variety of Strategies
B. Radius, Diameter, Arcs, Arc Measures, Chords, Secants, and Tangents
C. Inscribed Angles, Central Angles, Intersections of Secants and Tangents
D. Prove Theorems Related to Circles
E. Constructions with Tangents, Circumscribed and Inscribed Circles
F. Congruent and Concentric Circles
G. Circumference, Arc Length, and Areas of Circles and Sectors
H. Equations of Circles

IX. Polyhedra and Other Solids
A. Describe and Make Various Three Dimensional Figures
B. Nets or Patterns for Surfaces
C. Relationships between Faces, Edges, and Vertices
D. Symmetries
E. Spherical Geometry
F. Congruence and Similarity
G. Formulas for Volume and Surface Area