Mathematics – High School Geometry

Congruence, Proof, and Constructions	Similarity, Proof, and Trigonometry
• Prove theorems about triangles and other figures (e.g., that the sum of the measures of the angles in a triangle is 180°). • Given a transformation, work backwards to discover the sequence that led to the transformation. • Given two quadrilaterals that are reflections of each other, find the line of that reflection.	• Apply knowledge of trigonometric ratios and the Pythagorean Theorem to determine distances in realistic situations. (e.g., Determine heights of inaccessible objects using various instruments, such as clinometers, hypsometers, transits, etc.)
Extending to Three Dimensions	**Connecting Algebra and Geometry Through Coordinates**
• Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	• Use a rectangular coordinate system and build on understanding of the Pythagorean Theorem to find distances. (e.g., Find the area and perimeter of a real-world shape using a coordinate grid and Google Earth.) • Analyze the triangles and quadrilaterals on the coordinate plane to determine their properties. (e.g., Determine whether a given quadrilateral is a rectangle).
Circles With and Without Coordinates	**Applications of Probability**
• Use coordinates and equations to describe geometric properties algebraically. (e.g., Write the equation for a circle in the plane with specified center and radius.)	• Work with probability and using ideas from probability in everyday situations. (e.g., Compare the chance that a person who smokes will develop lung cancer to the chance that a person who develops lung cancer smokes.)
Modeling with Geometry	
• Analyze real-world situations using mathematics to understand the situation better and optimize, troubleshoot, or make an informed decision (e.g., estimate water and food needs in a disaster area, or use volume formulas and graphs to find an optimal size for an industrial package).	