Grade 10 (AAS): Geometry with Data Analysis

Geometry and Measurement

Areas and volumes of figures can be computed by determining how the figure might be obtained from simpler figures by dissection and recombination.

1 Given a cross section of a three-dimensional object, identify the shapes of twodimensional cross sections (limited to sphere, rectangular prism, or triangular prism). M.G.AAS.10.16

2 Compare and contrast the volume of real-world geometric figures. M.G.AAS.10.17

Constructing approximations of measurements with different tools, including technology, can support an understanding of measurement.

When an object is the image of a known object under a similarity transformation, a length, area, or volume on the image can be computed by using proportional relationships.

3 Find the perimeter or area of a square, rectangle, or equilateral triangle to solve real-world problems when given the length of at least one side. M.G.AAS.10.18

Applying geometric transformations to figures provides opportunities for describing the attributes of the figures preserved by the transformation and for describing symmetries by examining when a figure can be mapped onto itself.

4 Identify and/or model characteristics of a geometric figure that has undergone a transformation (reflection, rotation, translation) by drawing, explaining, or using manipulatives. M.G.AAS.10.21

Showing that two figures are congruent involves showing that there is a rigid motion (translation, rotation, reflection, or glide reflection) or, equivalently, a sequence of rigid motions that maps one figure to the other.

5 When given two congruent triangles that have been transformed (limit to a translation), determine the congruent parts. (Ex: Determine which leg on Triangle A is congruent to which leg on Triangle B). M.G.AAS.10.24

Using technology to construct and explore figures with constraints provides an opportunity to explore the independence and dependence of assumptions and conjectures.

Proof is the means by which we demonstrate whether a statement is true or false mathematically, and proofs can be communicated in a variety of ways (e.g., twocolumn, paragraph).

6 Demonstrate perpendicular lines, parallel lines, line segments, angles, and circles by drawing, modeling, identifying, or creating. M.G.AAS.10.30

7 When given an isosceles triangle and a measure of a leg or base angle, identify the measure of the other leg or base angle. M.G.AAS.10.31A

8 When given a parallelogram and the measure of one side or one angle, identify the measure of the opposite side or angle. M.G.AAS.10.31B

Proofs of theorems can sometimes be made with transformations, coordinates, or algebra; all approaches can be useful, and in some cases, one may provide a more accessible or understandable argument than another.

Recognizing congruence, similarity, symmetry, measurement opportunities, and other geometric ideas, including right triangle trigonometry, in real-world contexts provides a means of building understanding of these concepts and is a powerful tool for solving problems related to the physical world in which we live.

Experiencing the mathematical modeling cycle in problems involving geometric concepts, from the simplification of the real problem through the solving of the simplified problem, the interpretation of its solution, and the checking of the solution's feasibility, introduces geometric techniques, tools, and points of view that are valuable to problem-solving

9 Use geometric shapes to describe real world objects. M.G.AAS.10.36