Teaching Notes for Geometry
Homework #8

Overview: In this lesson, students will learn how to find surface area and volume of prisms. This class is mix of polygons from homework #5 and surface area and volume from homework #6.

Preparation: Watch the videos "All about polygons" if needed. Start out with reviewing smiley & frown face, area of triangle, regular polygons, apothem, radius, side length, perimeter, and Pythagorean Theorem all of which was learned for homework #5. Review the idea of surface area and volume.

The "formulas" we give students for these problems are more of an idea and a plug and chug kind of a thing. For the volume of the prism, it is just the area of the top polygon times the height of the prism. For the surface area, it's the area of the top polygon times 2 (because the top and the bottom are the same) plus the perimeter of the top polygon times the height of the prism.

Classroom Examples:

1) Find the surface area and volume for a right, regular, quadrilateral prism with a height of 13 and a radius of $6\sqrt{2}$
$$V = 1872$$
$$SA = 768$$

2) Find the surface area and volume for a right, regular, nonagonal prism with a height of 11, an apothem of 3, and a radius of 5.
$$V = 1188$$
$$SA = 900$$

3) Find the surface area and volume for a right, regular, hexagonal prism with a height of 2 and a side length of 12.
$$V = 432\sqrt{3}$$
$$SA = 216\sqrt{3} + 144$$

4) Find the surface area and volume for a right, regular, octagonal prism with a height of 6, a side length of 10, and a radius of 13.
$$V = 2880$$
$$SA = 960$$

5) Find the surface area and volume for a right, regular, triangular prism with a height of 8 and a radius of 14
$$V = 1176\sqrt{3}$$
$$SA = 159\sqrt{3}$$

6) Find the surface area and volume for a right, regular, pentagonal prism with a height of 9, an apothem of 8, and a radius of 15.
$$V = 360\sqrt{161}$$
$$SA = 130\sqrt{161}$$