

# Teaching Notes for Geometry

## Homework #5

Overview: In this lesson, students will learn about polygons.

Preparation: Watch video on “exterior and interior angles” and “all about polygons”

In class cover the following new vocabulary and define Apothem, Radius, Side Length, Inscribed & Circumscribed Circles.

Polygons: many sides

Regular Polygon: all sides equal

Triangle: 3 sides

Quadrilateral: 4 sides

Pentagon: 5 sides

Hexagon: 6 sides

Heptagon: 7 sides

Octagon: 8 sides

Nonagon: 9 sides

Decagon: 10 sides

Classroom Examples:

- 1) For a regular nonagon, find, exactly, its radius, its area, and the areas of the inscribed and circumscribed circles if its apothem is 14 and the length of one of its sides is 10.
- 2) Find the sum of the interior angles, the sum of the exterior angles, the size of one interior angle, and the size of one exterior angle in a regular hexagon.
- 3) For a regular hexagon, find, exactly, its radius, its apothem, its area, and the areas of the inscribed and circumscribed circles if its side length is 8.
- 4) For a regular pentagon, find, exactly, its apothem, its area, and the areas of the inscribed and circumscribed circles if its radius is 14 and the length of one of its sides is 10.

Answer to #1 is Radius =  $\sqrt{221}$ , Area = 630, Inscribed =  $196\pi$ , Circumscribed =  $221\pi$

Answer to #2 is 720 degrees, 360 degrees, 120 degrees, 60 degrees

Answer to #3 is Radius = 8, Apothem =  $4\sqrt{3}$ , Area =  $96\sqrt{3}$ , Inscribed =  $48\pi$  Circ =  $64\pi$

Answer to #4 is Apothem =  $3\sqrt{19}$ , Area = 350, Inscribed =  $171\pi$  Circ =  $196\pi$