

## Geometry, Concepts and Skills: Homework Help for Chapter 8

### Homework Help

#### Lesson 8.2: Angles in Polygons

#### Help for Exercises 21–23 on page 421

Here are two methods for finding the measure of an interior angle of each polygon in Exercises 21–23.

The first method involves the Polygon Interior Angles Theorem. First, count the number of sides  $n$  and substitute this value in the formula given in the theorem. The sum of the measures of the angles is  $(n - 2) \bullet 180^\circ$ . Since

there are  $n$  angles, the measure of each is  $\frac{(n - 2) \bullet 180^\circ}{n}$ .

Another method is to use the Polygon Exterior Angles Theorem and the definition of supplementary angles. The sum of the measures of the exterior angles of a convex polygon with  $n$  sides is  $360^\circ$ . Since the interior angles of a regular polygon are all congruent, the exterior angles are congruent as

well. So the measure of each exterior angle is  $\frac{360^\circ}{n}$  and the measure of each

interior angle is  $180^\circ - \frac{360^\circ}{n}$ . Consider Example 3 on page 418. Because the regular polygon has 8 sides, the measure of each exterior angle is

$\frac{360^\circ}{n} = 45^\circ$ , so the measure of each interior angle is  $180^\circ - 45^\circ = 135^\circ$ . This is the same result as the one given on page 418 using the first method described above and also shown in Example 3.