CHAPTER 6

Polygons and Quadrilaterals

6-1 The Polygon Angle-Sum Theorems

Content Standard
G.SRT.5 Use congruence . . . criteria to solve problems and prove relationships in geometric figures.

Objectives To find the sum of the measures of the interior angles of a polygon
To find the sum of the measures of the exterior angles of a polygon

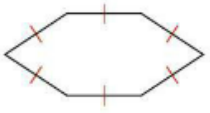
take note

Theorem 6-1 Polygon Angle-Sum Theorem

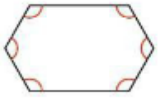
The sum of the measures of the interior angles of an n-gon is $(n - 2)180$.

Got It? 1. **a.** What is the sum of the interior angle measures of a 17-gon?
b. Reasoning The sum of the interior angle measures of a polygon is 1980. How can you find the number of sides in the polygon?

An **equilateral polygon** is a polygon with all sides congruent.



An **equiangular polygon** is a polygon with all angles congruent.



A **regular polygon** is a polygon that is both equilateral and equiangular.

Take note

Corollary to the Polygon Angle-Sum Theorem

The measure of each interior angle of a regular n-gon is $\frac{(n-2)180}{n}$.

Got It? 2. What is the measure of each interior angle in a regular nonagon?

1 interior ∠ of a ? polygon is 108°

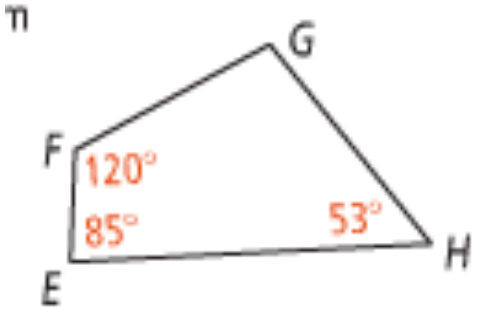
How many sides?

regular pentagon

perimeter = 20 in

1side = ?

Got It? 3. What is $m\angle G$ in quadrilateral $EFGH$?

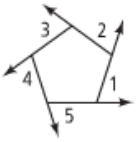


take note

Theorem 6-2 Polygon Exterior Angle-Sum Theorem

The sum of the measures of the exterior angles of a polygon, one at each vertex, is 360.

For the pentagon, $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 360$.



Got It? 4. What is the measure of an exterior angle of a regular nonagon?

1 exterior ∠ polygon is 20°
How many sides?