Chapter 6 Polygons & Quadrilaterals

Lesson 6.1 The Polygon Angle-Sum Theorem

Once you have received your sheet of paper from me, you can begin discovering the relationship between and interior and exterior angle measurements of polygons. You may use Geogebra if you want, but it is not necessary.

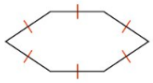
Theorem 6.1 Polygon Angle-Sum Theorem:
The sum of the measures of the interior angles of an n-gon is $(n - 2)180$.

Ex. What is the sum of the interior angles measures of a heptagon?

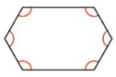
1 What is the sum of the interior angle measures of a 17-gon?

2 The sum of the interior angle measures of a polygon is 1980. What is the number of sides of the polygon?

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



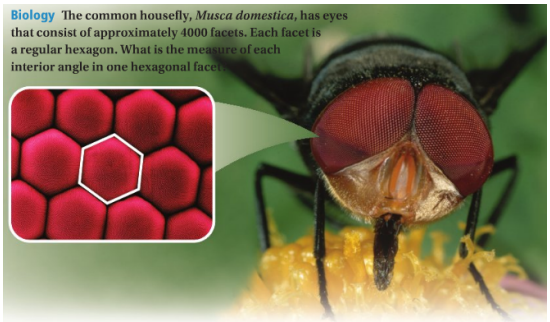
An **equiangular polygon** is a polygon with all angles congruent.



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

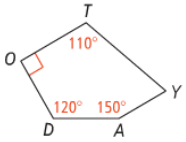
Corollary to the Polygon Angle-Sum Theorem:
The measure of each interior angle of a regular n-gon is $\frac{(n - 2)180}{n}$.

Ex. What is the measure of an interior angle of a regular pentagon?

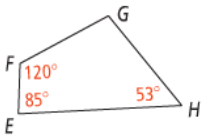


3 What is the measure of the interior angle of a regular decagon?

Ex. What is m<Y in pentagon TODAY?

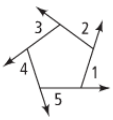


4 What is m<G in quadrilateral EFGH?

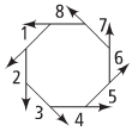


Theorem 6.2 Polygon Exterior Angle-Sum Theorem:
The sum of the measures of the exterior angles of a polygon, one at each vertex, is 360.

*For the pentagon, m<1 + m<2 + m<3 + m<4 + m<5 = 360



Ex. What is m<1 in the regular octagon below?



5 What is the measure of an exterior angle of a regular nonagon?