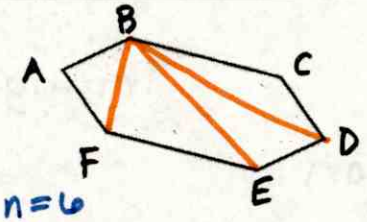
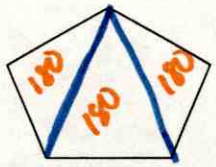
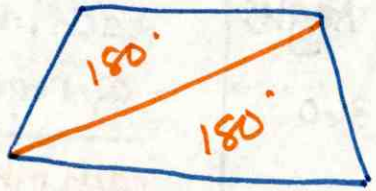
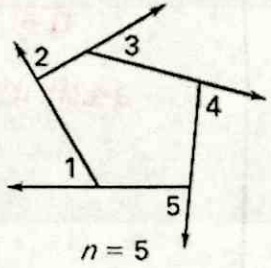
Section 8.1 Date

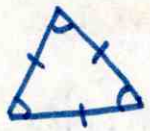
Find Angle Measures in Polygons

Vocabulary	Definition	Example
DIAGONAL	A diagonal of a polygon is a segment that joins two *nonconsecutive vertices* in a polygon. n = # of sides	 $\overline{BF}$, $\overline{BE}$ and $\overline{BD}$ are diagonals of Hexagon ABCDEF n=6 (6-2)=4
THEOREM 8.1 POLYGON INTERIOR ANGLES THEOREM	The sum of the measures of the interior angles of a convex n - gon is (n - 2) · 180 °. # of Δs (Δ sum)	$m\angle 1 + m\angle 2 + \cdots + m\angle n = (n - 2) \cdot 180$  n=5 (5-2)180 3(180) =540° sum of int. ∠s = (n-2)180°
COROLLARY to THEOREM 8.1 INTERIOR ANGLES of a QUADRILATERAL	The sum of the measures of the interior angles of a quadrilateral is 360 °.	 n=4 (4-2)180 2(180) =360°
THEOREM 8.2 POLYGON EXTERIOR ANGLES THEOREM	The sum of the measures of the exterior angles of a convex polygon, one at each vertex, is 360 °.	 $m\angle 1 + m\angle 2 + \cdots + m\angle n = 360°$ sum of ext. ∠s = 360°

n (# of sides)	classify/Name
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Septagon / Heptagon
8	Octagon
9	Nonagon
10	Decagon
11	Undecagon / 11-gon
12	Dodecagon
n	n-gon
27	27-gon

Regular Polygon - A polygon where all sides are integers (positive) and congruent to each other and all angles are congruent.

Triangle (n=3) Equilateral



Quadrilateral (n=4) Square

n = 5

Regular Pentagon

Regular ...

Interior Angles

sum = $(n-2)180$

Exterior Angles

sum = 360

Regular

each int ∠ = $\frac{(n-2)180^\circ}{n}$ each ext ∠ = $\frac{360}{n}$

interior ∠ + Exterior ∠ = 180° LP

what is the measure of ...

each interior angle in a regular polygon	each exterior angle in a regular polygon
each int. ∠ = $\frac{(n-2)180}{n}$	each ext. ∠ = $\frac{360}{n}$
n = 9	n = 9
each int. ∠ = $\frac{(9-2)180}{9}$	each ext. ∠ = $\frac{360}{9}$
= 140°	= 40°

interior ∠ and exterior ∠ form a LP.

int ∠ + ext ∠ = 180