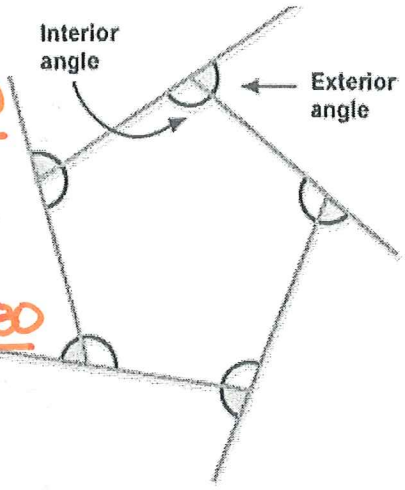
Polygon Sum Conjectures: Notes

Exterior Angle Theorem:

Sum of the exterior angles = 360°

each ∠ or have a regular polygon = $\frac{360}{n}$



Polygon Sum Theorem:

Sum of the interior angles = $(n-2)\cdot 180$

each ∠ or have a regular polygon = $\frac{(n-2)\cdot 180}{n}$

Regular Polygon:

ALL ≅ sides
ALL ≅ angles

Examples:

Find the following for each polygon: (a) the sum of the measures of the interior angles and (b) the sum of the measures of the exterior angles.

1. A decagon

a) $(10-2)\cdot 180 = 1440°$

b) 360°

2. A 34-gon

a) $(34-2)\cdot 180 = 5760°$

b) 360°

Find the following for each regular polygon: (a) the measure of each exterior angle, (b) the measure of each interior angle

3. A heptagon

a) $\frac{360}{7} = 51.4°$

b) $\frac{(7-2)\cdot 180}{7} = 128.6°$

4. A 16-gon

a) $\frac{360}{16} = 22.5°$

b) $\frac{(16-2)\cdot 180}{16} = 157.5°$

5. A regular polygon has an exterior angle with a measure of 30°. Find the number of sides.

$\frac{360}{n} = 30 \cdot n \longrightarrow \frac{360}{30} = \frac{30n}{30}$ **n = 12 sides**

6. A regular polygon has 15 sides. Find the measure of each exterior angle.

$\frac{360}{15} = 24°$