

Key

Angles in Polygons – Assignment Part 1

I. Fill in the chart for the regular polygons.

Polygon	$(n-2)(180)$ Sum of Interior \angle 's	Each Interior \angle	Sum of Exterior \angle 's	Each Exterior \angle
octagon	1080°	135°	360°	45°
heptagon	900°	128.6°		51.4°
20-gon	3240°	162°		18°
pentagon	540°	108°		72°
decagon	1440°	144°		36°
12-gon	1800°	150°		30°
18-gon	2880°	160°		20°
hexagon	720°	120°		60°
nonagon	1260°	140°		40°
36-gon	6120°	170°		10°
Triangle	180°	60°		120°
quadrilateral	360°	90°		90°
72-gon	12600°	175°	✓	5°

II. Solve the following word problems.

- 1) If the sum of the interior angles is 1980°, what is the name of the polygon?

$$\frac{(n-2)(180)}{180} = \frac{1980}{180} \quad n-2=11 \quad n=13\text{-gon}$$

- 2) If each of the exterior angles is 15°, what is the name of the polygon?

$$\frac{360}{n} = 15 \rightarrow n = 24\text{-gon}$$

- 3) If each on the interior angles is 108°, what is the name of the polygon?

$$\frac{(n-2)(180)}{n} = 108 \rightarrow (n-2)(180) = 108n \rightarrow \frac{180n-360}{-180n} = \frac{108n}{-180n} \rightarrow \frac{-360}{-72} = \frac{-72n}{-72} \quad n=5$$

- 4) If it is a decagon, what is the sum of the exterior angles?

$$n=10$$

$$360^\circ$$

pentagon

- 5) If the sum of the interior angles is 3600°, what is the name of the polygon?

$$\frac{(n-2)180}{180} = \frac{3600}{180} \quad n-2=20 \quad n=22\text{-gon}$$

- 6) If each of the exterior angles is 24°, what is the name of the polygon?

$$\frac{360}{n} = 24 \quad 15\text{-gon}$$

- 7) If each of the interior angles is 135°, what is the name of the polygon?

$$\frac{(n-2)(180)}{n} = 135 \quad 135n = (n-2)(180) \rightarrow \frac{135n}{-180n} = \frac{180n-360}{-180n} \rightarrow \frac{-45n}{-45} = \frac{-360}{-45} \quad n=8$$

- 8) If each of the exterior angles is 60°, what is the name of the polygon?

$$\frac{360}{n} = 60 \quad \text{hexagon}$$

octagon

- 9) If each interior angle is 160°, what is the name of the polygon?

$$\frac{(n-2)(180)}{n} = 160 \rightarrow 160n = (n-2)(180)$$

Find the value of x in each of the following

$$160n = 180n - 360$$

$$\frac{-20n}{-20} = \frac{-360}{-20}$$

$$n = 18\text{-gon}$$