**6-1 Properties and Attributes of Polygons**

**Side of the polygon-** each segment that forms a polygon

**Vertex of the polygon-** the common endpoint of two sides

**Diagonal-** a segment that connects any two nonconsecutive vertices

You can name a polygon by the number of sides:



**Convex Polygon-** if no diagonal contains points in the exterior, then the polygon is *convex.*

**Concave Polygons-** if any part of a diagonal contains points in the exterior of the polygon

A *concave polygon*  seems to “cave in” or have a dent.

Theorem 6-1-1 Polygon Angle Sum Theorem

The sum of the interior angle measures of a convex polygon with *n* sides is (*n* – 2)180⁰

Example: Find the sum of the interior angle measures of a convex octagon.

1. (*n*-2) 180⁰ (Polygon Angle Sum Theorem)
2. (8-2) 180⁰ (An octagon has 8 sides, so substitute 8 for *n*)
3. (8-2)180= 1440 – 360 (Distribute through- 180 x 8= 1440, then 180 x 2=360)
4. 1080⁰ (1440-360= 1080..simplify by subtracting)

Theorem 6-1-2 Polygon Exterior Angle Sum Theorem

The sum of the exterior angle measures, one angle at each vertex, of a convex polygon is 360⁰

Example: **Find the measure of each exterior angle of a regular hexagon.**

1. A hexagon has 6 sides and 6 vertices.
2. The sum of the exterior angles = 360⁰ *Polygon Exterior Angle Sum Theorem*
3. The measure of one exterior angle is

360 ÷ 6 = 60⁰ *A regular hexagon has 6 congruent exterior angles, so divide the sum by 6.*