

Angle Properties in Polygons



convex

non-convex
(concave)

Convex Polygon – A polygon in which each interior angle measures less than 180° .

Example 1: Investigating the Sum of the Angle Measures in a Convex Polygon

How is the number of sides in a convex polygon related to the sum of its interior angles?

- a. Draw the polygons listed in the table below. Create triangles to help you determine the sum of the measures of their interior angles. Record your results.

Polygon	Number of Sides	Number of Triangles	Sum of Angle Measures
triangle	3	1	180°
quadrilateral	4		
pentagon	5		
hexagon	6		
heptagon	7		
octagon	8		

- b. Make a conjecture about the relationship between the sum, S , of the measures of the interior angles of a polygon and the number, n , of sides of the polygon. *

* For a proof of this formula, see the text book p.96.

Example 2: Determine the Sum of the Interior Angles in a Convex Polygon

Determine the sum of the measures of the interior angles of a dodecagon (12-sided polygon).

Example 3: Determine Angle Measures in a Regular Polygon

Outdoor furniture and structures like gazebos sometimes use a regular hexagon in their building plan. Determine the measure of *each* interior angle of a regular hexagon.

**Example 4: Determine the Number of Sides in a Regular Polygon**

If each interior angle of a regular convex polygon measures 156° , determine how many sides the polygon has.