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10th Grade Geometry
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Polygon Internal Angles Theorem

The sum of the internal angles of a polygon is related to the number of its sides by the formula $S = (n - 1)180°$. The proof depends on the division of the polygon into triangles, each of which has an internal angle sum of 180°, as shown in Figure 1.

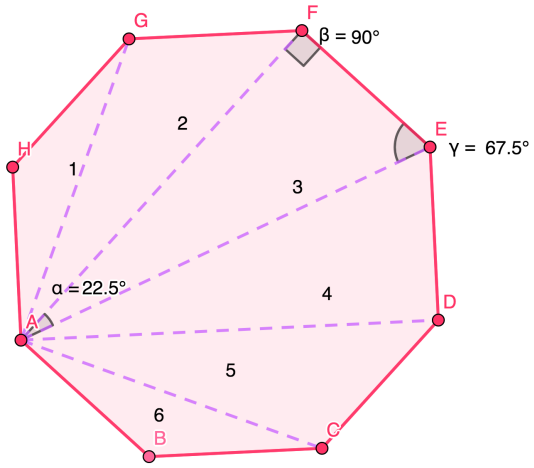

Figure 1: Octagon showing partition into six triangles

The initial pattern of polygon sides versus the sum of angle measures is shown in Table 1.

Table 1: Summary of the number of polygon sides versus angle sum.

n	$m<$	Sum of angles
3	60	180
4	90	360
5	108	540
6	120	720
n	$m< V = \frac{(n-2)180°}{n}$	S = (n – 2) 180°