

Investigation: Polygon Angle Sums

one angle in  $n$   
regular polygon w/  $n$  sides  
 $\frac{180(n-2)}{n}$

Complete the table below:

First sketch all possible diagonals from vertex A in each polygon in the 1<sup>st</sup> column. Write the correct word to classify the polygon by its number of sides in 2<sup>nd</sup> column. Then fill in the other columns for each polygon. The most important line is the last one, where you come up with a rule for the sum of the interior angles of a polygon with "n" sides and use it to find the sum of the angles in a 20-sided polygon.

Sketch	Classify	# of sides	# of diagonals from A	# of triangles (@ 180° per triangle)	Total degrees of interior angles
	triangle	3	0	1	180°
	quadrilateral	4	1	2	360°
	pentagon	5	2	3	540°
	hexagon	6	3	4	$\cdot 180 = 720^\circ$
	heptagon	7	4	5	900°
	octagon	8	5	6	1080°
	decagon	10	7	8	<sup>180</sup> 1440°
	dodecagon	12	9	10	1800°
	n-gon	$n$	$n-3$	$n-2$	$180(n-2)$ <u>SUM</u>

Use chart on p 54 of textbook to assist with classification. Below: Find the sum of the angles of a polygon with 20 sides: (show work) ~~20~~  $180(20-2) = 180 \cdot 18 = 3240^\circ$