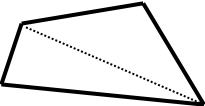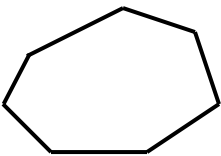Name _____

Period _____   Date _____

EXPLORE/EXPLAIN

Sum of the interior angles

Triangle Angle-Sum Theorem states that the sum of the interior angles of a triangle is 180°. Now you can use this theorem to investigate the sum of the measures of the interior angles of any polygon.

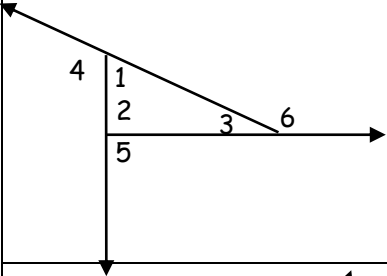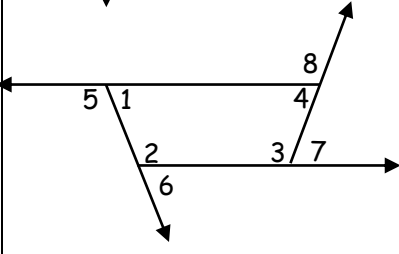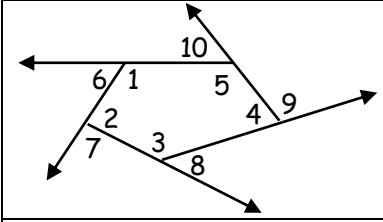Work with a partner. Record your data in the table below.

   a. Sketch polygons with 4, 5, 6, 7, and 8 below.
   b. Divide each polygon into triangles by drawing all the diagonals from **one vertex**.
   c. Multiply the number of triangles by 180° to find the sum of the measures of the interior angles of each polygon.
   d. Write a conjecture for finding the sum of the measures of the interiors angles of a polygon with "n" sides.

Name of polygon	Sketch of polygon	Number of sides	Number of triangles formed	Sum of the interior angle measures
Quadrilateral		4		
Pentagon				
n-gon		n		

Sum of the exterior angles

The figures below show one exterior angle drawn at each vertex of each polygon.   Work with your partner and record your data in the table below.

a. Calculate the sum of the measures of the exterior angles of each polygon.
b. Make a conjecture about the sum of the measures of the exterior angles of a polygon with "n" sides.

Polygons	Column 1 Sum of the measures of the interior angles	Column 2 number of linear pairs x 180°	Exterior Angle Sum Sum of the exterior angle measures (column 2 - column 1)
	$(m\angle 1 + m\angle 2 + m\angle 3) =$ 180	$3(180°) = 540$	$540 - 180 =$ _____
	$(m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4)$		
n-gon			