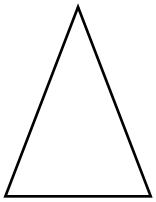
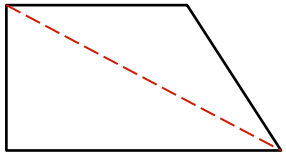
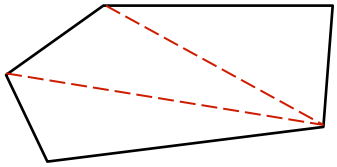
Math 2201 **Angle Properties in Convex Polygons**
Sec 2.4 **Name: _____**

Question #1:

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

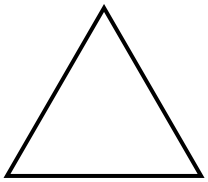
To help answer the question refer to the completed table below. Some hints are included.

- Separate each polygon into specific triangles by drawing **non-intersecting diagonals.** Each vertex of a triangle must be a vertex of the original triangle.

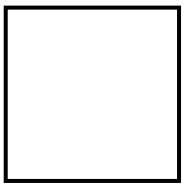
#of Sides	Convex Polygons	# of Triangles Formed	Sum of Interior Angles
3	 You can't draw any diagonals here because every vertex is already connected by a side.	1	180^0
4	 Only one diagonal can drawn because any other diagonal is a side or would intersect.	2	360^0 (since each triangle is 180^0)
5		3	540^0

Part 1: Interior Angles

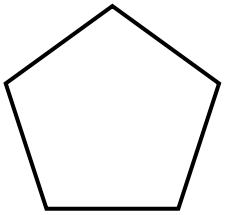
- Complete a similar table for **regular polygons.**
- A regular polygon has equal side lengths and equal interior angles.



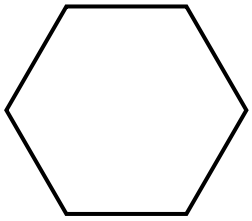
Equilateral Triangle



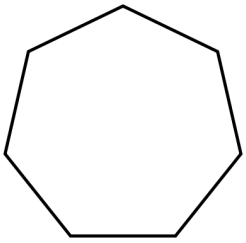
Quadrilateral
(square)



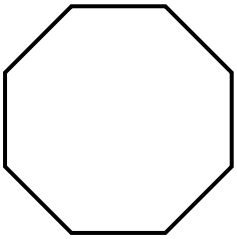
Pentagon



Hexagon



Heptagon



Octagon

Regular Polygon	**# of Sides, n**	**# of Triangles**	**Sum of Interior Angles, S**
Triangle			
Quadrilateral			
Pentagon			
Hexagon			
Heptagon			
Octagon			

a). Make a conjecture about the relationship between the sum of the interior angles of a polygon, S, and the number of sides of the polygon, n.

b). Use your conjecture to predict the sum of the interior angles of a dodecagon (12 sides). Verify your prediction by sketching the polygon with its triangles.

c). What would be the measure of **each** interior angle in a dodecagon?