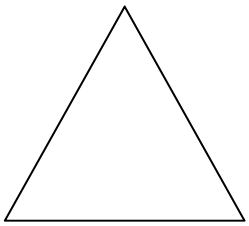
Name:_____ Date:_____

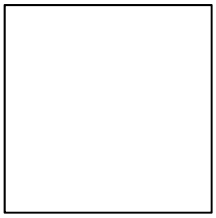
Period:_____

Aim: What is the sum of the interior and exterior angles in any polygon?

Do Now:

1. What is the sum of the measures of the angles inside a triangle? A square?



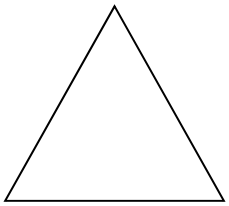
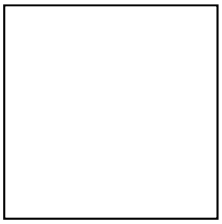
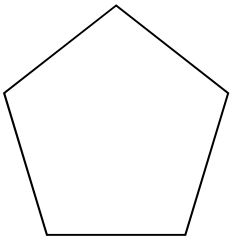


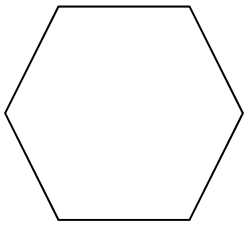
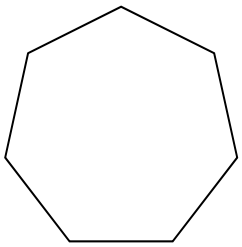
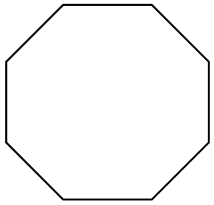
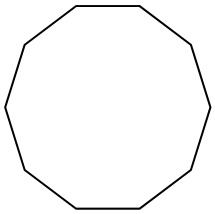
2. What is the sum of the measures of the exterior angles of any polygon? _____

Sum of the Interior Angles of a Polygon Investigation

Steps for each Polygon:

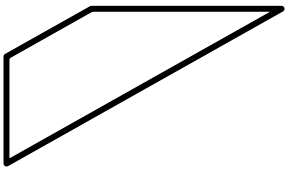
1. Count the number of sides in the polygon. Record this number in your table.
2. Pick a vertex. Draw diagonal lines from this vertex to every other non-adjacent vertex to create triangles. Count how many triangles you have created. Record the number of triangles in your table.
3. Multiply the number of triangles by 180° to find the sum of all interior angles in the polygon.
4. Repeat Steps 1-3 for each polygon.

Polygon	Number of Sides	Number of Triangles	Sum of Interior Angles
			
			
			

Shape	Number of Sides	Number of Triangles	Sum of Interior Angles
			
			
			
			
Come up with a formula ->	n (any number of sides)		

Reflection Questions:

1. Look back at the polygons used in the investigation activity. All of the polygons used are regular polygons (all sides are equal). Do you think the formula will still hold true if we did not use a regular polygon? For example, would the formula still work for the non-regular polygon below?



2. How can we use the formula to find the measure of only one interior angle in an equilateral polygon? Try finding one interior angle of a regular hexagon.

Practice Problems

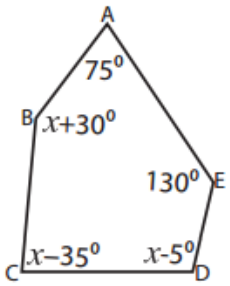
3. What is the sum of the interiors angles in a regular 24-gon?

4. What is the measure of one interior angle in a regular 24-gon?

5. Could a polygon have an interior angle sum of 4500°? If so, how many sides would it have?

6. Find the missing angle in the irregular polygon below

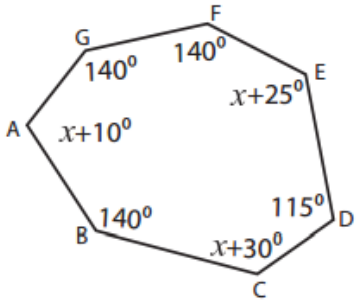
7.



Sum of the interior angles = _____

x = ____ ;∠B = ____ ;∠C = ____ ;∠D = ____

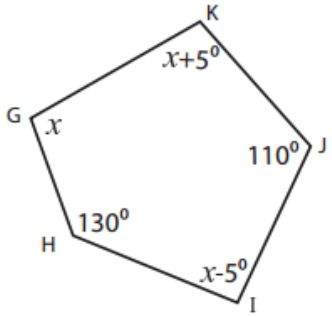
8.



Sum of the interior angles = _____

x = ____ ;∠A = ____ ;∠C = ____ ;∠E = ____

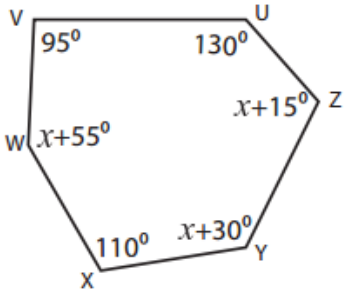
9.



Sum of the interior angles = _____

x = ____ ;∠G = ____ ;∠I = ____ ;∠K = ____

10.



Sum of the interior angles = _____

x = ____ ;∠W = ____ ;∠Y = ____ ;∠Z = ____