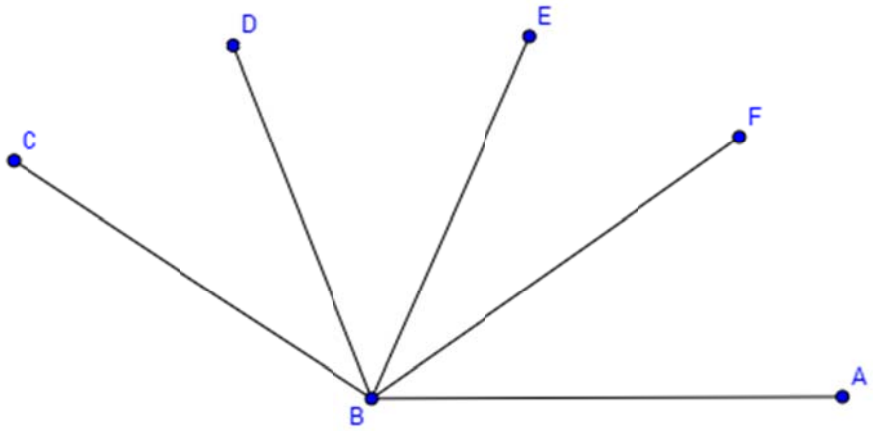
Name:_____ Period:_____ Date:_____

1.5 Measuring and Constructing Angles Investigation

1. Find the measure of the following angles in degrees using a protractor.



$\angle ABC =$_____ $\angle ABE =$_____

$\angle FBE =$ _____ $\angle FBC =$ _____

$\angle EBC =$ _____ $\angle EBD =$ _____

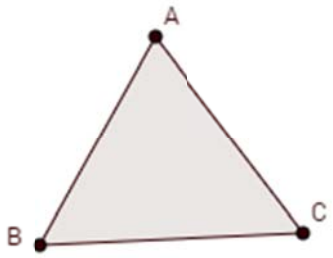
$\angle FBD =$ _____ $\angle ABF =$ _____

Put an "O" next to the angles that are obtuse, an "A" next to the angles that are acute.

2. On a notecard, construct a triangle by drawing two 1 inch line segments meeting at a 120 degree. This is called an isosceles scalene triangle. Cut it out and use it to draw three hexagons below.

Now partition the hexagons into smaller polygons. One as two trapezoids, one as a rectangle and two triangles and one as six triangles.

For each of the polygons below, divide the figure into triangles by drawing the maximum number of diagonals from <u>one vertex</u>. Do not cross the diagonals! Then use the triangles to figure out the sum of the interior angles for each polygon in degrees and write it on the line provided.



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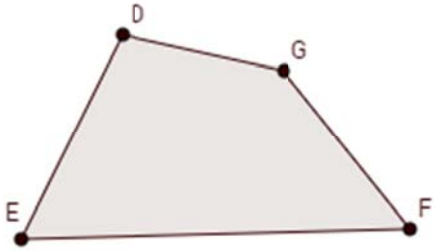

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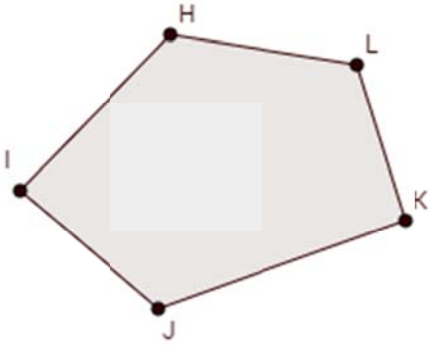

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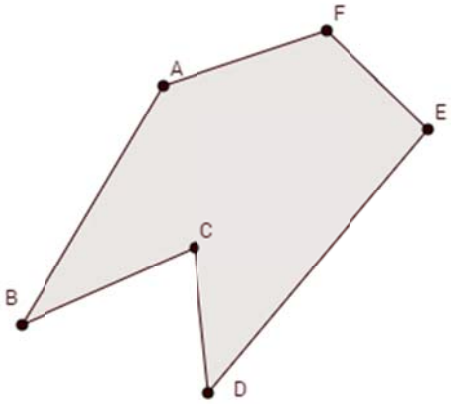

_____

Let's look for patterns (aka inductive reasoning).

If a polygon has n sides (so for a hexagon, n = 6), how many triangles can you partition the polygon into the way described above?

_____

What is the sum of the interior angles of a triangle? _____

What is the formula for finding the sum of the interior angles for any n-sided polygon?

_____

Why is it important for this investigation that we do not cross the diagonals?

Go back to 2 on the previous page and find the sum of the interior angles for each of the smaller polygons you partitioned the hexagon into. Does the sum of the interior angles of the smaller polygons add up to the sum of the interior angles of a hexagon?