Polygon Sum Investigation – WRITE IN YOUR “IN-CLASS” NOTEBOOK

1) Make good sketches with a ruler in a row at the top of your page:

Triangle Quadrilateral Pentagon Hexagon

They should be convex (not concave), and NOT equilateral, NOT equiangular.

2) Name the vertices of each of your figures however you want.

3) Pick one vertex of each figure and “dash-in” all the diagonals in the polygon from that one vertex (NOT FROM ALL VERTICES, JUST FROM ONE).

4) Under each sketch, write the number of triangles formed inside the polygon. (Can there be any diagonals in a triangle?)

5) Write this sentence under the numbers you just wrote and fill in the blank:

The sum of the measures of the angles of any triangle is \_\_\_\_\_\_\_\_\_.

6) Now use the number of triangles and the last sentence (and a calculator) to figure out the sum of the angles of the triangles in each polygon. Write “under” appropriate polygon on the next line.

7) Is the sum of the angles of the triangles the same as the sum of the angles of each polygon? In other words, do all of the angles of the triangles completely fill up the angles of the polygon with no leftovers or gaps? (Rhetorical question… )

8) Without a sketch… what if you wanted to know the sum of the angles of a 20-gon (a polygon with 20 sides)? How could you figure that out? Discuss with partner; show calculations in your notes; be ready to explain what you were thinking.

9) Suppose you have n sides on a polygon. Write a rule for the sum of the angles in the n-gon.

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