Kite Investigation Name_____

Use this GeoGebra applet to help you complete the following investigation. **BE SURE to move the vertices and sides of this kite around after completing each step in order to help you make more informed conjectures:**

1) Measure and display the lengths of all 4 sides. What, if anything, do you notice?

2) Construct both diagonals of this kite. That is, construct segments $\overline{AC}$ and $\overline{BD}$. Plot and label their point of intersection point "E".

3) Use the **Distance** tool to find and display the values *AE, BE, CE, & DE*.. What do you notice? Describe in detail.

4) Find and display the measures both angles found at each of the kite's 4 vertices. (so 8 angles total). What do you notice? Describe.

5) Measure just one of the four angles you see with vertex *E*. What is the measure of the angle at which these diagonals intersect? After doing this, hide this angle measure. (You can easily do this by right clicking on the angle itself and uncheck the "Show Object" box.)

6) Now right click on the polygon itself. Then un-check "Show Object" (to hide it). Do the same for the pink angle *A* you see.

7) Construct polygon (triangle) *ABC*. Then reflect this polygon about $\overline{AC}$. What do you notice?

8) Use GeoGebra to "UNDO" BOTH ACTIONS in step (7).

9) Now construct polygon (triangle) *DBA*. Then reflect this polygon about diagonal $\overline{DB}$. What do you notice?

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10) Use your observations in this investigation to answer the following questions:

Are opposite sides of a kite congruent?

Are opposite angles (ENTIRE ANGLES—like angle *DAB* & angle *DCB*) of a kite congruent? If so, how many pairs?

Do the diagonals of a kite bisect EACH OTHER?
If not, does at one diagonal get bisected by the other?

Does a diagonal of a kite bisect a pair of opposite angles?
If so, how many diagonals do this?

Are the diagonals of a kite perpendicular?

Are the diagonals of a kite congruent?

Does either diagonal of a kite serve as a line of symmetry?
If so, how many?

Is a kite a parallelogram? If so, WHY is it a parallelogram? If not, why is it not a parallelogram?

**If you indicate a kite is NOT a parallelogram, which parallelogram would you say a kite resembles most? Why is this? Describe.