

Rhombus Investigation

Name _____

Use this GeoGebra applet to help you complete the following investigation. **BE SURE to move the vertices and sides of this rhombus 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 the midpoint of \overline{AC} (even though you haven't constructed \overline{AC} yet.) Label this point "E".

- 3) Construct segments with lengths AE , BE , CE , & DE . Then measure and display their lengths. What do you notice? Describe in detail.

- 4) Measure & display the measures of the 12 angles that are formed by the intersection of these diagonals with each other and with the rhombus. What do you notice? Describe.

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

- 7) Use GeoGebra to "UNDO" BOTH ACTIONS in step (6).

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

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

Are opposite sides of a rhombus congruent?

Are opposite angles (ENTIRE ANGLES—like angle DAB & angle DCB) of a rhombus congruent?

Do the diagonals of a rhombus bisect EACH OTHER?

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

Are the diagonals of a rhombus perpendicular?

Are the diagonals of a rhombus congruent?

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

Is a rhombus a parallelogram? If so, WHY is it a parallelogram?
(Provide at least 3 reasons to verify your answer.)