6.4 Special Parallelograms Guided Notes

Name ______________________

Objectives: Use properties of diagonals of rhombuses and rectangles. Determine whether a parallelogram is a rectangle or a rhombus.

Rhombus: A parallelogram with 4 CONGRUENT SIDES

1. Label the congruent sides of the rhombus.
2. Draw the diagonals of the rhombus.
3. Measure the angles where the diagonals meet.
4. Measure all of the angles at each vertex.
5. Label all of the measurements on the diagram.

Use the information that you found above to fill in the blanks below.

The diagonals of a rhombus are _______PERPENDICULAR______.
Each diagonal of a rhombus _______BISETS TWO ANGLES OF THE PARALLELOGRAM______.

Rectangle: A parallelogram with 4 RIGHT ANGLES

1. Label the congruent sides of the rectangle.
2. Label the angles of the rectangle.
3. Draw the diagonals of the rectangle.
4. Measure the lengths of the diagonals.
5. Label all of the measurements on the diagram.

Use the information that you found above to fill in the blanks below.

The diagonals of a rectangle are _______CONGRUENT______.

Square: A square is both a RHOMBUS and a RECTANGLE. Therefore it has the properties of _______BOTH______.

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Is it a rectangle or a rhombus?

- If one diagonal of a parallelogram bisects two angles of the parallelogram, then the parallelogram is a **rhombus**.

- If the diagonals of a parallelogram are **congruent**, then the parallelogram is a rectangle.

- If the diagonals of a parallelogram are **perpendicular**, then the parallelogram is a rhombus.

1. Is the following a rhombus, rectangle, or neither? Explain.

2. Is the following a rhombus, rectangle, or neither? Explain.

3. A parallelogram has angles of 30°, 150°, 30°, and 150°. Can you conclude that it is a rhombus or a rectangle? Explain.

4. Find the measures of the numbered angles in the rhombus:
   \[ m \angle 1 = 90^\circ \quad m \angle 3 = 50^\circ \quad m \angle 2 = 50^\circ \quad m \angle 4 = 40^\circ \]

5. Draw rectangle **GFED**. Find the value of \( y \) and the length of each diagonal if \( FD = 5y - 9 \) and \( GE = y + 5 \).
   \[ FD = 8.5 \quad AE = 8.5 \]
   \[ 5y - 9 = y + 5 \]
   \[ y = 3.5 \]