HN Math 3 Unit 6, Day 4 Quadrilaterals Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*SWBAT use the properties of quadrilaterals to solve for unknowns and complete proofs.*

|  |  |  |
| --- | --- | --- |
| Rectangle | Rhombus | Square |
| Def: A **rectangle** is a parallelogram with four right angles. | Def: A **rhombus** is a parallelogram with four congruent sides. | Def: A **square** is a parallelogram with 4 congruent sides and 4 right angles. |
| A **rectangle** has all the properties of a parallelogram PLUS:* 4 right angles
* Diagonals are congruent

 | A **rhombus** has all the properties of a parallelogram PLUS:* 4 congruent sides
* Diagonals bisect angles
* Diagonals are perpendicular

 | A **square** has all the properties of a parallelogram PLUS:* All the properties of a rectangle
* All the properties of a rhombus

https://dj1hlxw0wr920.cloudfront.net/userfiles/wyzfiles/ebed6a2c-7998-4f62-b5d9-1f03b4b5baa2.gif |



**Example 2:** Using the diagram to the right to answer the following if ▭ABCD is a rhombus.

1. Find the m∠1.
2. Find the m∠2.
3. Find the m∠3.
4. Find the m∠4.

**Example 3:** Solve for each variable if the following are rhombi.

|  |  |  |  |
| --- | --- | --- | --- |
| Trapezoid | Def: A **trapezoid** is a quadrilateral with exactly one pair of parallel sides, called *bases*, and two nonparallel sides, called *legs*. | Isosceles Trapezoids | Trapezoid Midsegment |
| Def: An **isosceles trapezoid** is a trapezoid with congruent legs. | Def: The **median** (also called the midsegment) of a trapezoid is a segment that connects the midpoints of the two legs. |
| A trapezoid is isosceles if there is only:* One set of parallel sides
* Base angles are congruent
* Legs are congruent
* Diagonals are congruent
* Opposite angles are supplementary
 | **Theorem:** If a quadrilateral is a trapezoid, then a) the midsegment is parallel to the bases and b) the length of the midsegment is half the sum of of the bases |
|  |  |

1.  b)

**Example 4:** What are the values of x and y in the **Example 5:** $\overbar{QR}$ is the midsegment of isosceles triangle below if $\overbar{DE}$ || $\overbar{DC}$? trapezoid LMNP. What is x and LM?

****



|  |  |  |
| --- | --- | --- |
| Kite | Def: A **kite** is a quadrilateral with two pairs of adjacent, congruent sides. | If a quadrilateral is a kite, then: |
| Its diagonals are perpendicular. | Its diagonals bisect the opposite angles. | One pair of opposite angles are congruent. | One diagonal bisects the other. |
|  | thkite4 | thkite2 | thkite3 |

**Example 6:** Quadrilateral DEFG is a kite. What are m∠1, m∠2, and m∠3?



**Example 7:** Quadrilateral KLMN is a kite. What are m∠1, m∠2, and m∠3?