Math 3 8.4 Quadrilaterals Unit 8

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

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| Rectangle | Rhombus | Square |
| A **rectangle** is a parallelogram with four right angles. | A **rhombus** is a parallelogram with four congruent sides. | A **square** is a parallelogram with four congruent sides and four 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

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**Example 1:** Solve for x and the measure of each angle if ▭DGFE is a rectangle.

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**Example 2:** ▭ABCD is a rectangle whose diagonals intersect at point E.

1. If AE = 36 and CE = 2x – 4, find x.
2. If BE = 6y + 2 and CE = 4y + 6, find y.

**Example 3:** 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 4:** Solve for each variable if the following are rhombi.

1. 
2.

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| Trapezoid | A **trapezoid** is a quadrilateral with exactly one pair of parallel sides, called *bases*, and two nonparallel sides, called *legs*. | Isosceles Trapezoids | Trapezoid Midsegment |
| An **isosceles trapezoid** is a trapezoid with congruent legs. | The **median** (also called the midsegment) of a trapezoid is a segment that connects the midpoint of one leg to the midpoint of the other leg. |
| 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 the lengths of the bases |
|  |  |

**Example 5:** CDEP is an isosceles trapezoid and m<C = 65. What are m<D, m<E, and m<F?

**Example 6:** What are the values of x and y in the isosceles triangle below if DE || DC?

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**Example 7:** QR is the midsegment of trapezoid LMNP. What is x and the length of LM?

**You Try!** TU is the midsegment of trapezoid WXYZ. What is x and the length of TU?

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| Kite | 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 4:** Quadrilateral DEFG is a kite. What are m<1, m<2, and m<3?



**You Try!** Quadrilateral KLMN is a kite. What are m<1, m<2, and m<3?

