

Name: Answer Key

Date: _____

Lesson #3: Rhombi and Squares

Properties of Rhombi

Fill in the blanks:

➤ Rhombi have the SAME properties as parallelograms:

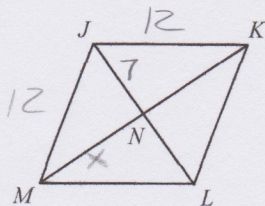
1. Opposite sides are congruent.
2. Opposite sides are parallel.
3. Opposite angles are congruent.
4. Consecutive angles are Supplementary.
5. Diagonals bisect each other.

➤ PLUS these!

1. Four congruent sides.
2. Diagonals are perpendicular.
3. Diagonals bisect opposite angles.

Practice Together:

1. $JK = 12$ and $JN = 7$



$$JM = \underline{12}$$

$$JL = \underline{14}$$

$$MN = \underline{9.7}$$

$$MK = \underline{19.4}$$

$$7 + 7 = 14$$

$$9.7 + 9.7 = 19.4$$

$$\text{Let } x = MN$$

$$7^2 + x^2 = 12^2$$

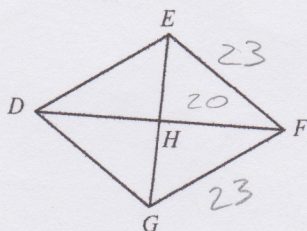
$$49 + x^2 = 144$$

$$\sqrt{x^2} = \sqrt{95}$$

$$x = 9.7$$

Practice On Your Own:

2. $EF = 23$ and $DF = 40$

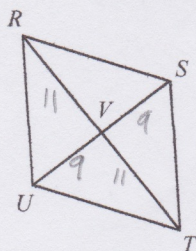


$$\begin{aligned} GF &= \underline{23} \\ HF &= \underline{20} \quad \frac{40}{2} = 20 \\ GH &= \underline{11.4} \\ GE &= \underline{22.8} \quad 11.4 + 11.4 \end{aligned}$$

Let $GH = x$

$$\begin{aligned} x^2 + 20^2 &= 23^2 \\ x^2 &= 23^2 - 20^2 \\ x^2 &= 129 \end{aligned}$$

3. $RT = 22$ and $US = 18$



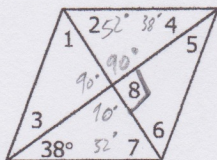
$$\begin{aligned} VT &= \underline{11} \quad \frac{22}{2} = 11 \\ UV &= \underline{9} \quad \frac{18}{2} = 9 \\ RS &= \underline{14.2} \\ ST &= \underline{14.2} \end{aligned}$$

$x = RS$

$$\begin{aligned} 11^2 + 9^2 &= x^2 \\ 121 + 81 &= x^2 \\ \sqrt{x^2} &= \sqrt{202} \\ x &= 14.2 \end{aligned}$$

Practice Together:

- 4.



$$m\angle 4 = 38^\circ$$

Diagonals are perpendicular

$$m\angle 8 = 90^\circ$$

Diagonals bisect opposite angles for rest

$$m\angle 1 = \underline{52^\circ}$$

$$m\angle 5 = \underline{38^\circ}$$

4. $m\angle 2 = \underline{52^\circ}$

$$m\angle 6 = \underline{52^\circ}$$

$$m\angle 3 = \underline{38^\circ}$$

3. $m\angle 7 = \underline{52^\circ}$ $180^\circ - 90^\circ - 38^\circ$

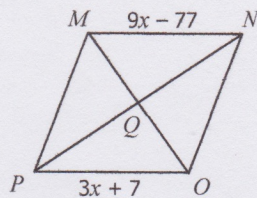
1. $m\angle 4 = \underline{38^\circ}$

2. $m\angle 8 = \underline{90^\circ}$

alt. int
angles
of 7

5.

If $MNOP$ is a rhombus, find MP .



$$9x - 77 = 3x + 7$$

$$9x - 3x = 7 + 77$$

$$6x = 84$$

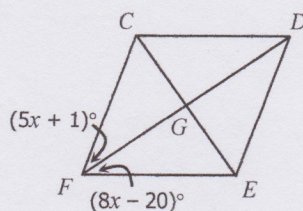
$$x = 14$$

$$PO = 3(14) + 7 = 49$$

$$MP = 49$$

6.

If $CDEF$ is a rhombus, find $m\angle FED$.



$$5x + 1 = 8x - 20$$

$$8x - 5x = 1 + 20$$

$$3x = 21$$

$$x = 7$$

$$\begin{aligned} m\angle CFG &= 5(7) + 1 \\ &= 36^\circ \end{aligned}$$

$$\begin{aligned} m\angle CFE &= 36 \cdot 2 \\ &= 72^\circ \end{aligned}$$

$$m\angle FED = 180^\circ - 72^\circ$$

$$m\angle FED = 108^\circ$$

Properties of Squares

Fill in the blanks:

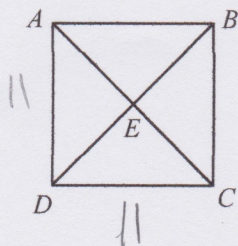
➤ Squares have ALL the properties of a parallelogram, rectangle, and rhombus.

1. Opposite sides are congruent.
2. opposite sides are parallel.
3. Opposite angles are congruent.
4. Consecutive angles are supplementary.
5. Diagonals bisect each other.
6. Four right angles.
7. Diagonals are congruent.
8. Four congruent sides.
9. Diagonals are perpendicular.
10. Diagonals bisect opposite angles.

Practice Together:

1.

If $ABCD$ is a square and $AD = 11$, find each missing value.



$$\begin{aligned}
 x &= AC \\
 11^2 + 11^2 &= x^2 \\
 242 &= x^2 \\
 x &= 15.6
 \end{aligned}$$

$$BC = \underline{11}$$

$$AC = \underline{15.6}$$

$$BD = \underline{15.6}$$

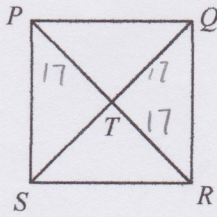
$$EC = \underline{7.8}$$

$$\frac{15.6}{2} = 7.8$$

Practice Separately:

2.

If $PQRS$ is a square and $TR = 17$, find each missing value.



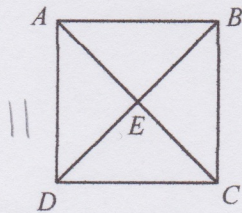
$$\begin{aligned} x &= PQ \\ 17^2 + 17^2 &= x^2 \\ 289 + 289 &= x^2 \\ 578 &= x^2 \\ x &= 24 \end{aligned}$$

$$\begin{aligned} PR &= \frac{34}{2} = 17 \\ QS &= \frac{34}{2} = 17 \\ QT &= \frac{17}{2} = 8.5 \\ PQ &= \frac{24}{2} = 12 \end{aligned}$$

Practice Together:

3.

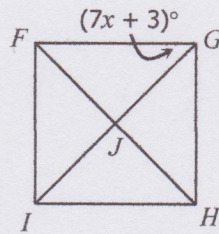
If $ABCD$ is a square and $AD = 11$, find each missing value.



$$\begin{aligned} m\angle DAB &= 90^\circ \\ m\angle AEB &= 90^\circ \\ m\angle CBD &= 45^\circ \\ m\angle BAC &= 45^\circ \end{aligned}$$

4.

If $FGHI$ is a square, solve for x .

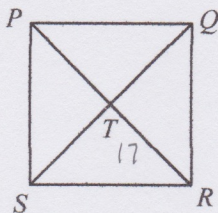


$$\begin{aligned} 7x + 3 &= 45 \\ 7x &= 45 - 3 \\ 7x &= 42 \\ x &= 6 \end{aligned}$$

Practice Separately:

5.

If $PQRS$ is a square and $TR = 17$, find each missing value.



$$\begin{aligned} m\angle PRS &= 45^\circ \\ m\angle STR &= 90^\circ \\ m\angle PSR &= 90^\circ \\ m\angle QPR &= 45^\circ \end{aligned}$$