

6-4

Properties of Rhombuses, Rectangles, and Squares

Content Standards
G.CO.11 Prove theorems about parallelograms ... rectangles are parallelograms with congruent diagonals.
 Also G.SRT.5

Objectives To define and classify special types of parallelograms
 To use properties of diagonals of rhombuses and rectangles

Take note

Key Concept Special Parallelograms

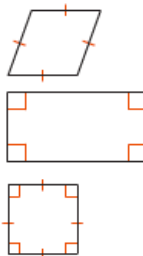
Definition

A **rhombus** is a parallelogram with four congruent sides.

A **rectangle** is a parallelogram with four right angles.

A **square** is a parallelogram with four congruent sides and four right angles.

Diagram



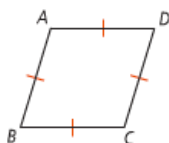
Take note

Theorem 6-13

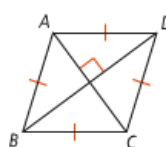
Theorem

If a parallelogram is a rhombus, then its diagonals are perpendicular.

If ...
 $ABCD$ is a rhombus



Then ...
 $\overline{AC} \perp \overline{BD}$

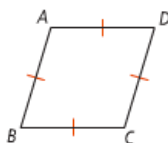


Theorem 6-14

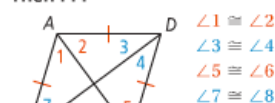
Theorem

If a parallelogram is a rhombus, then each diagonal bisects a pair of opposite angles.

If ...
 $ABCD$ is a rhombus



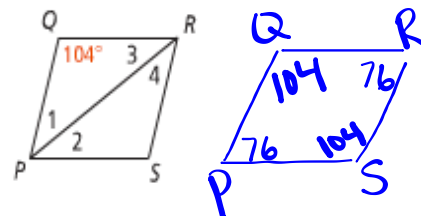
Then ...



- $\angle 1 \cong \angle 2$
- $\angle 3 \cong \angle 4$
- $\angle 5 \cong \angle 6$
- $\angle 7 \cong \angle 8$



Got It? 2. What are the measures of the numbered angles in rhombus $PQRS$?



$$104 + m\angle P = 180$$

$$m\angle P = 76^\circ$$

$$m\angle R = 76^\circ$$

$$\frac{76}{2} = 38^\circ = \angle 1 = \angle 2 = \angle 3 = \angle 4$$

Take note

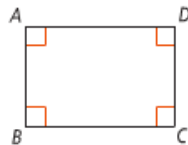
Theorem 6-15

Theorem

If a parallelogram is a rectangle, then its diagonals are congruent.

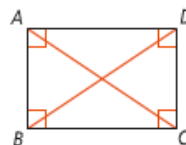
If ...

$ABCD$ is a rectangle



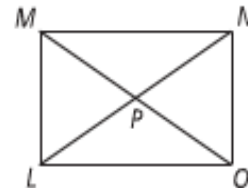
Then ...

$\overline{AC} \cong \overline{BD}$



Got It? 3. a. If $LN = 4x - 17$ and $MO = 2x + 13$, what are the lengths of the diagonals of rectangle $LMNO$?

b. ~~Reasoning~~ What type of triangle is $\triangle MPN$? Explain.



$$4x - 17 = 2x + 13$$

$$2x - 17 = 13$$

$$2x = 30$$

$$x = 15$$

$$2(15) + 13$$

$$43 = LN = MO$$

Name

6.4

pg. 379-381 # 7, 8,

10-22 even,

24-39,

42-44,

47, 50, 52

55'-58

Notes 6.5