

6-5

Conditions for Rhombuses, Rectangles, and Squares

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

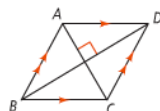
Objective To determine whether a parallelogram is a rhombus or rectangle

Take note

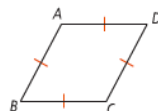
Theorem 6-16

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

If ...
 $ABCD$ is a \square and $\overline{AC} \perp \overline{BD}$



Then ...
 $ABCD$ is a rhombus

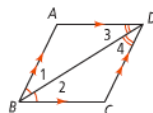


Take note

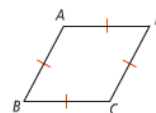
Theorem 6-17

Theorem
 If one diagonal of a parallelogram bisects a pair of opposite angles, then the parallelogram is a rhombus.

If ...
 $ABCD$ is a \square , $\angle 1 \cong \angle 2$, and $\angle 3 \cong \angle 4$



Then ...
 $ABCD$ is a rhombus

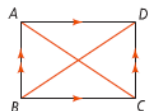


You will prove Theorem 6-17 in Exercise 23.

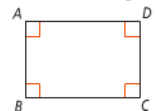
Theorem 6-18

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

If ...
 $ABCD$ is a \square , and $\overline{AC} \cong \overline{BD}$

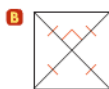
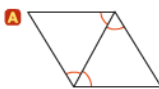


Then ...
 $ABCD$ is a rectangle



Problem 1 Identifying Special Parallelograms

Can you conclude that the parallelogram is a rhombus, a rectangle, or a square? Explain.



rhombus
 1 pair of opp. \angle s
 are bisected

rhombus - diagonals are \perp
 rectangle - diagonals are \cong
 \downarrow
SQUARE



Got It? 1. a. A parallelogram has angle measures of 20, 160, 20, and 160. Can you conclude that it is a rhombus, a rectangle, or a square? Explain.

not a square or a rectangle - need 4 rt. \angle s
 could be a rhombus - not enough info

PARALLELOGRAM



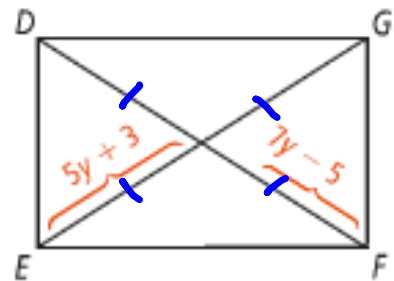
2. For what value of y is $\square DEFG$ a rectangle?

$$7y - 5 = 5y + 3$$

$$2y - 5 = 3$$

$$2y = 8$$

$$y = 4$$



Name

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Notes 6.6