

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

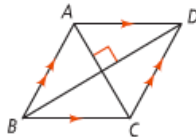
Theorem 6-16

Theorem

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

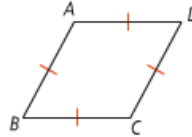
If . . .

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



Then . . .

$ABCD$ is a rhombus



Take note

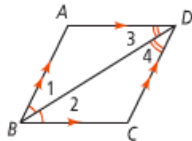
Theorem 6-17

Theorem

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

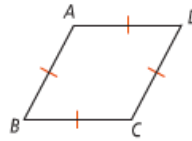
If . . .

$ABCD$ 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.

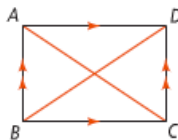
Theorem 6-18

Theorem

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

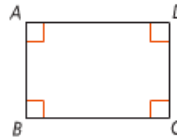
If . . .

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



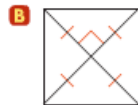
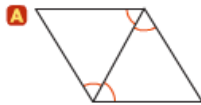
Then . . .

$ABCD$ is a rectangle



Problem 1 Identifying Special Parallelograms

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



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.

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

