Name _____ Date _____

LESSON 8.6

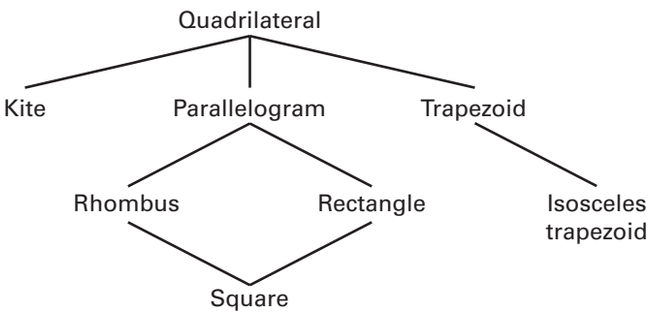
Study Guide

For use with pages 552–557

GOAL **Identify special quadrilaterals.**

Vocabulary

Relationships among special quadrilaterals:



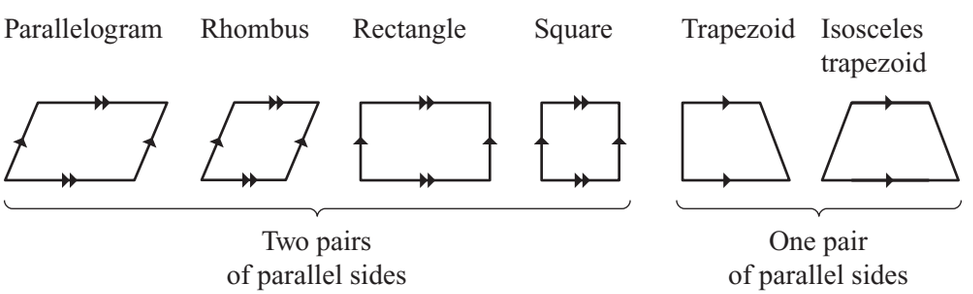
Each shape in the diagram has the properties of the shapes linked above it. For example, a rhombus has the properties of a parallelogram and a quadrilateral.

EXAMPLE 1 ## Identify quadrilaterals

Quadrilateral *WXYZ* has at least one pair of opposite sides that are parallel. What types of quadrilaterals meet this condition?

Solution

There are many possiblities.



Exercises for Example 1

1. Quadrilateral *ABCD* has congruent diagonals. What types of quadrilaterals meet this condition?

2. Quadrilateral *ABCD* has exactly one pair of opposite angles that are congruent. What types of quadrilaterals meet this condition?

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Study Guide *continued*

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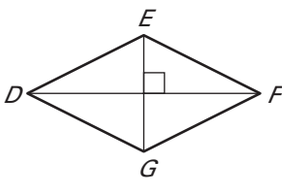
EXAMPLE 2 Classify a quadrilateral

What is the most specific name for quadrilateral *DEFG*?



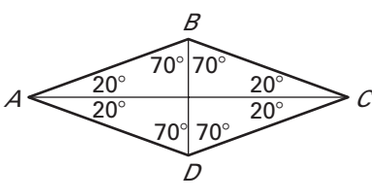
Solution

The diagram shows that the diagonals are perpendicular, which is true of kites, rhombuses, and squares.

However, there is no information given about whether the sides are parallel, so you cannot determine whether the quadrilateral is a rhombus or a square. The most specific name you can give quadrilateral *DEFG* is a kite.

EXAMPLE 3 Identify a quadrilateral

Is enough information given in the diagram to show that quadrilateral *ABCD* is a rhombus? *Explain*.



Solution

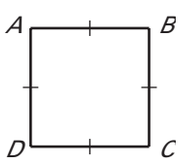
STEP 1 Show that *ABCD* is a parallelogram. From the diagram, $m\angle B = m\angle D = 70° + 70° = 140°$, and $m\angle A = m\angle C = 20° + 20° = 40°$. So, $\angle B \cong \angle D$ and $\angle A \cong \angle C$, and by Theorem 8.4, quadrilateral *ABCD* is a parallelogram.

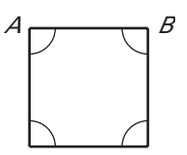
STEP 2 Show that parallelogram *ABCD* is a rhombus. The diagram shows that each diagonal bisects a pair of opposite angles, so by Theorem 8.12, quadrilateral *ABCD* is a rhombus.

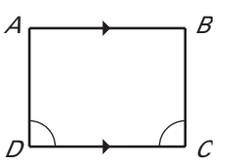
Yes, the diagram is sufficient to show that *ABCD* is a rhombus.

Exercises for Examples 2 and 3

Give the most specific name for the quadrilateral. *Explain* your reasoning.

3. 

4. 

5. 

6. You are given the following information about quadrilateral *ABCD*: $AB = 6$, $CD = 12$, $m\angle A = 115°$, and $m\angle D = 65°$. Is enough information given to conclude that quadrilateral *ABCD* is a trapezoid? *Explain* your reasoning.