8.6 Identify Special Quadrilaterals

Goal • Identify special quadrilaterals.

Your Notes

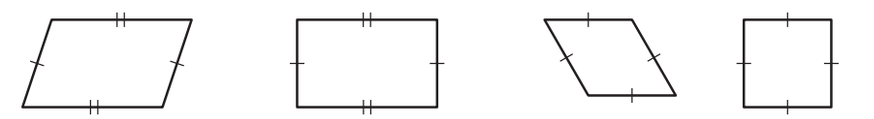
Example 1 ***Identify quadrilaterals***

Quadrilateral *ABCD* has both pairs of opposite sides congruent. What types of quadrilaterals meet this condition?

Solution

There are many possibilities.

Parallelogram Rectangle Rhombus Square



Opposite sides are congruent. All sides are congruent.

✔ ***Checkpoint*** **Complete the following exercise.**

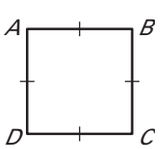
1. Quadrilateral *JKLM* has both pairs of opposite angles congruent. What types of quadrilaterals meet this condition?

parallelogram, rectangle, square, rhombus

In Example 2, *ABCD* is shaped like a square. But you must rely only on marked information when you interpret a diagram.

Example 2 ***Identify a quadrilateral***

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



Solution

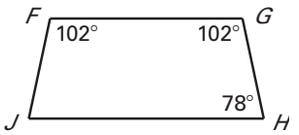
The diagram shows that both pairs of opposite sides are congruent. By Theorem 8.7, *ABCD* is a parallelogram. All sides are congruent, so *ABCD* is a rhombus by definition.

Squares are also rhombuses. However, there is no information given about the angle measures of *ABCD*. So, you cannot determine whether it is a square.

Your Notes

Example 3 ***Identify a quadrilateral***

Is enough information given in the diagram to show that quadrilateral *FGHJ* is an isosceles trapezoid? *Explain*.



Solution

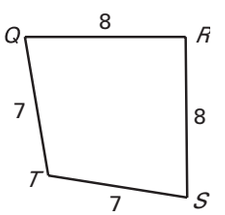
Step 1 **Show** that *FGHJ* is a trapezoid . $\angle G$ and $\angle H$ are supplementary but $\angle F$ and $\angle G$ are not. So, $\overline{FG} \parallel \overline{HJ}$, but $\overline{FJ}$ is not parallel to $\overline{GH}$. By definition, *FGHJ* is a trapezoid .

Step 2 **Show** that trapezoid *FGHJ* is isosceles . $\angle F$ and $\angle G$ are a pair of congruent base angles . So, *FGHJ* is an isosceles trapezoid by Theorem 8.15.

Yes, the diagram is sufficient to show that *FGHJ* is an isosceles trapezoid.

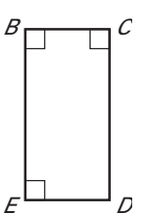
Checkpoint **Complete the following exercises.**

2. What is the most specific name for quadrilateral *QRST*? *Explain* your reasoning.



Kite; there are two pairs of consecutive congruent sides.

3. Is enough information given in the diagram to show that quadrilateral *BCDE* is a rectangle? *Explain*.



Yes; you know that $m\angle D = 90°$ by the Triangle Sum Theorem. Both pairs of opposite angles are congruent, so *BCDE* is a parallelogram by Theorem 8.8. By definition, *BCDE* is a rectangle.

Homework