Name: _____

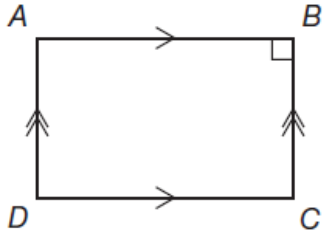
Date: _____

Period: _____

Geometry Lesson 65

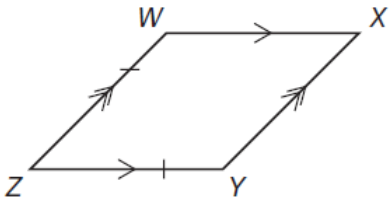
Objective: TSW distinguish types of parallelograms.

Lesson 61 presented several methods for determining if a quadrilateral is a parallelogram. The properties presented in this lesson make it possible to determine if a parallelogram is a rectangle, square, or rhombus.



Properties of Parallelograms - If an angle in a parallelogram is a right angle then the parallelogram is a rectangle.

Since $\angle B$ is a _____ angle, *ABCD* is a _____.



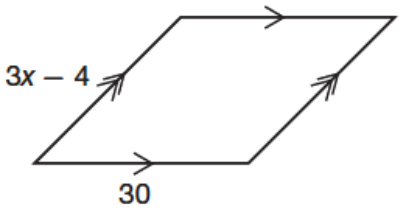
Properties of Parallelograms - If consecutive sides of a parallelogram are congruent, then the parallelogram is a rhombus.

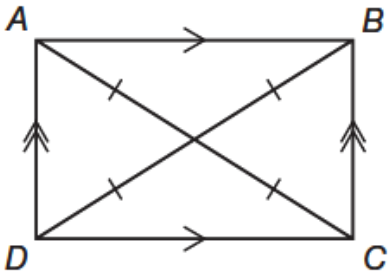
Since $\overline{WZ} \cong \overline{ZY}$, *WXYZ* is a _____.

Example 1 Proving Parallelograms Are Rhombuses

Is this parallelogram a rhombus if $x = 11$?

SOLUTION





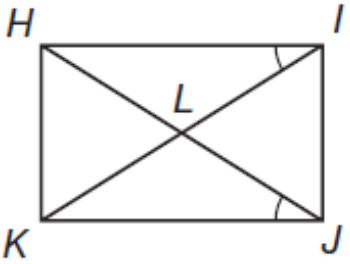
Properties of Parallelograms - If the diagonals of a parallelogram are congruent then it is a rectangle.

Since $\overline{AC} \cong \overline{BD}$, *ABCD* is a _____.

Example 2 Proving Parallelograms are Rectangles

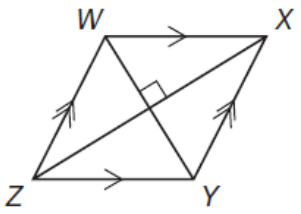
Is parallelogram *HIJK* a rectangle?

SOLUTION



Properties of Parallelograms - If the diagonals of a parallelogram are perpendicular then it is a rhombus.

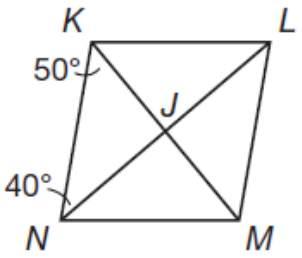
Since $\overline{WY}$ is a _____ to $\overline{ZX}$, *WXYZ* is a _____.



Example 3 Proving Parallelograms are Rhombuses

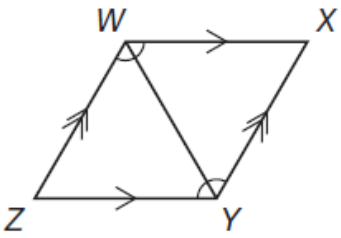
Is parallelogram *KLMN* a rhombus?

SOLUTION



Properties of Parallelograms - If a diagonal in a parallelogram bisects opposite angles, then it is a rhombus.

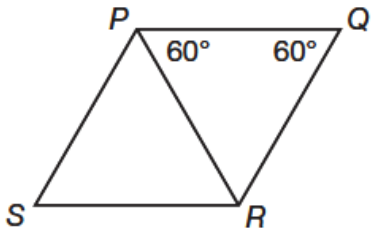
Since $\angle XWY \cong \angle ZWY$ and $\angle XYW \cong \angle ZYW$, *WXYZ* is a _____.



Example 4 Proving Parallelograms are Rhombuses

Is parallelogram *PQRS* a rhombus?

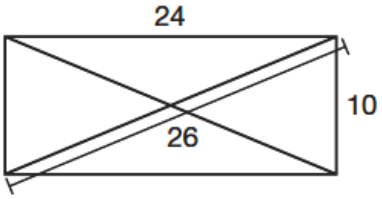
SOLUTION



Example 5 Application: Signs

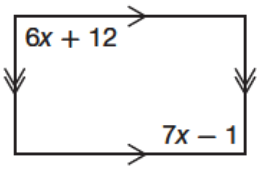
A sign maker is commissioned to make a rectangular sign. The sign needs to be a perfect rectangle. Given the measurements shown in the diagram, is the sign a rectangle? How do you know?

SOLUTION

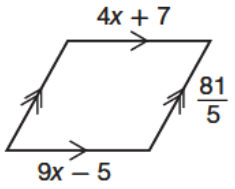


You Try!!!!!

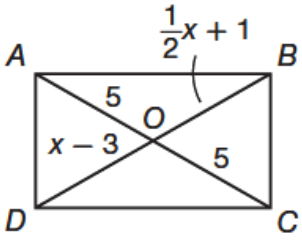
a. Is this parallelogram a rectangle?



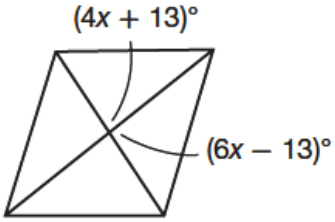
b. Is this parallelogram a rhombus?



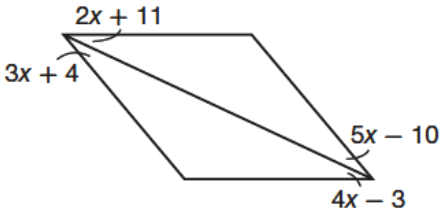
c.Is this parallelogram a rectangle?



d.Is this parallelogram a rhombus?



e.Is this parallelogram a rhombus?



f.A sign in the shape of a parallelogram has diagonals that create an equilateral triangle as shown. Is the sign a perfect rectangle? Explain how you know.