

Section 6.4 Special Parallelograms - Rectangles

Then

You used properties of parallelograms and determined whether quadrilaterals were parallelograms.

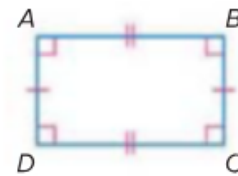
Now

- Recognize and apply properties of rectangles.
- Determine whether parallelograms are rectangles.

Section 6.4 Special Parallelograms - Rectangles

1 Properties of Rectangles A **rectangle** is a parallelogram with four right angles.
By definition, a rectangle has the following properties.

- All four angles are right angles.
- Opposite sides are parallel and congruent.
- Opposite angles are congruent.
- Consecutive angles are supplementary.
- Diagonals bisect each other.



Rectangle ABCD

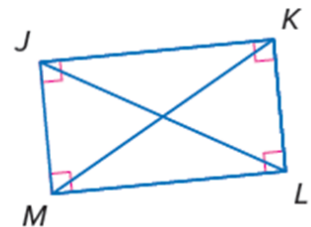
Theorem 6.13 Diagonals of a Rectangle



If a parallelogram is a rectangle, then its diagonals are congruent.

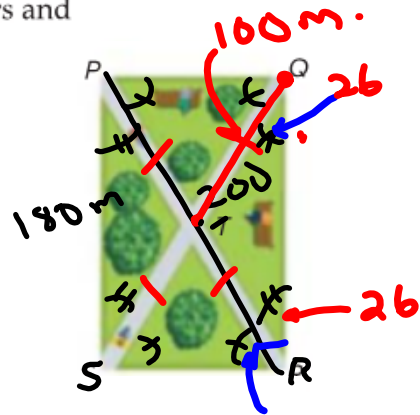
Abbreviation If a \square is a rectangle, *diag. are* \cong .

Example If $\square JKLM$ is a rectangle, then $\overline{JL} \cong \overline{MK}$.



Real-World Example 1 Use Properties of Rectangles

PARKS The Parks and Wildlife organization plans to add two diagonal walking paths, as shown, to one of its rectangular parks. If $PS = 180$ meters and $PR = 200$ meters, find QT .



Guided Practice Refer to the figure in Example 1.

1A. If $TS = 120$ meters, find PR .

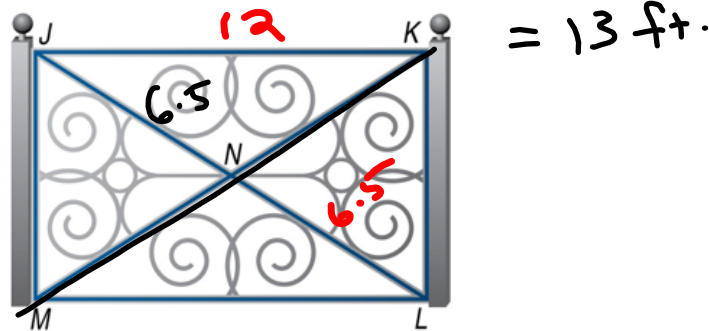
1B. If $m\angle PRS = 64$, find $m\angle SQR = 26^\circ$

$$PR = 270$$

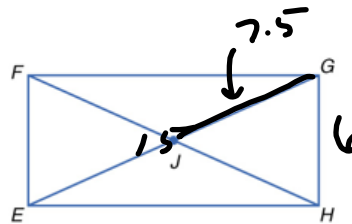
Real-World Example 1

Use Properties of Rectangles

CONSTRUCTION A rectangular garden gate is reinforced with diagonal braces to prevent it from sagging. If $JK = 12$ feet, and $LN = 6.5$ feet, find KM .



Quadrilateral $EFGH$ is a rectangle. If $GH = 6$ feet and $FH = 15$ feet, find GJ .

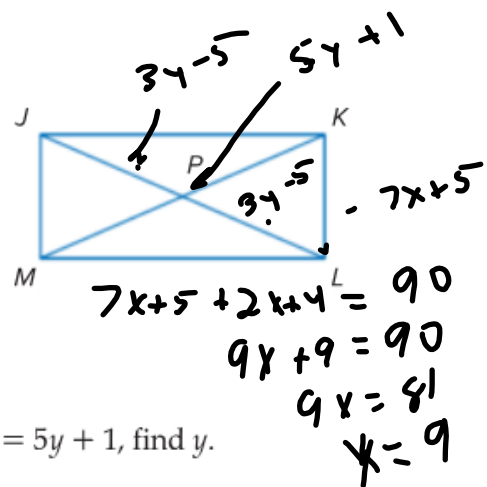


Example 2 Use Properties of Rectangles and Algebra

ALGEBRA Quadrilateral $JKLM$ is a rectangle. If $m\angle KJL = 2x + 4$ and $m\angle JLK = 7x + 5$, find x .

$$64 - 10 = 5x + 1$$

$$x = 11$$



Guided Practice

2. Refer to the figure in Example 2. If $JP = 3y - 5$ and $MK = 5y + 1$, find y .