Geometry 6.4
Recognize and apply properties of rectangles
Determine whether parallelograms are rectangles

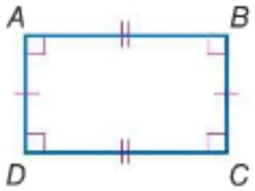
parallelogram
rectangle – para. w 4 90°'s

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.

In addition, the diagonals of a rectangle are congruent.



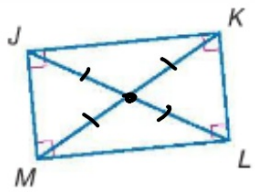
Rectangle *ABCD*

Theorem 6.13 Diagonals of a Rectangle

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

Abbreviation *If a ▱ is a rectangle, diag. are ≅.*

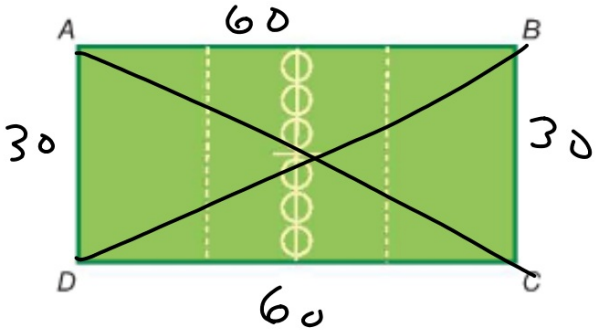
Example If ▱*JKLM* is a rectangle, then $\overline{JL} \cong \overline{MK}$.



You will prove Theorem 6.13 in Exercise 33.

Real-World Example 3 Providing Rectangle Relationships

DODGEBALL A community recreation center has created an outdoor dodgeball playing field. To be sure that it meets the ideal playing field requirements, they measure the sides of the field and its diagonals. If $AB = 60$ feet, $BC = 30$ feet, $CD = 60$ feet, $AD = 30$ feet, $AC = 67$ feet, and $BD = 67$ feet, explain how the recreation center can be sure that the playing field is rectangular.



Which distance(s) would it be helpful to know?

Example 4 Rectangles and Coordinate Geometry

COORDINATE GEOMETRY Quadrilateral $PQRS$ has vertices $P(-5, 3)$, $Q(1, -1)$, $R(-1, -4)$, and $S(-7, 0)$. Determine whether $PQRS$ is a rectangle by using the Distance Formula.

(pyth. theorem)

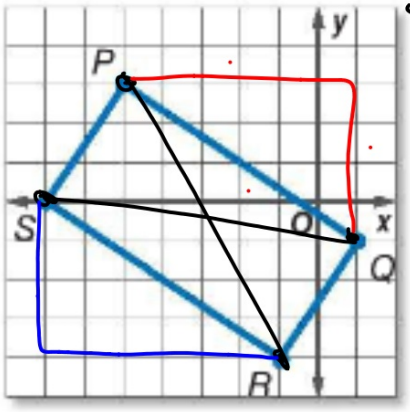
$PR = 6^2 + 4^2 = 36 + 16$

$SQ = 4^2 + 6^2$

$\sqrt{52}$

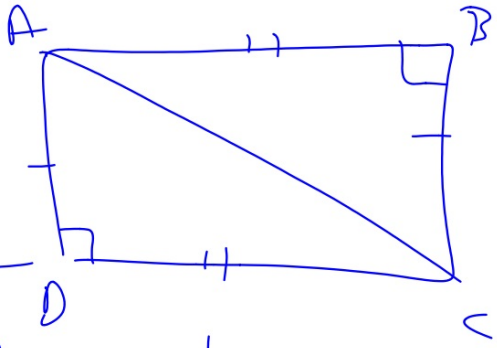
$\sqrt{52}$

yes diag =



G: Rect. ABCD

P: $\triangle ADC \cong \triangle CBA$



1. Rect ABCD	1. given
2. $\overline{AD} \cong \overline{BC}$, $\overline{AB} \cong \overline{DC}$	2. def rect
3. $\overline{AC} \cong \overline{AC}$	3. refl.
4. $\triangle ADC \cong \triangle CBA$	4. SSS

3. $\angle D \cong \angle B$	3. rect $\Rightarrow$ 90°
4. $\triangle ADC \cong \triangle CBA$	SAS

WB 6.4

sk. 1–10

pr. odds