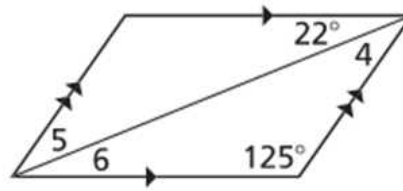
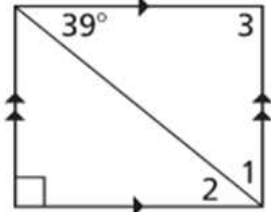


Starter

15-Oct-15

Use the diagrams to determine the measure of each angle.



1. $m\angle 1$ 51°

2. $m\angle 2$ 39°

3. $m\angle 3$ 90°

4. $m\angle 4$ 33°

5. $m\angle 5$ 33°

6. $m\angle 6$ 22°

Quadrilaterals

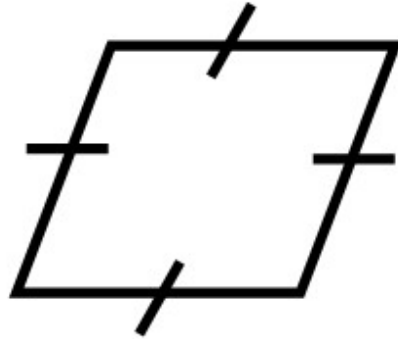
Rectangle (rect.)

A \square with 4 right \angle s.



Rhombus (plural - rhombi)

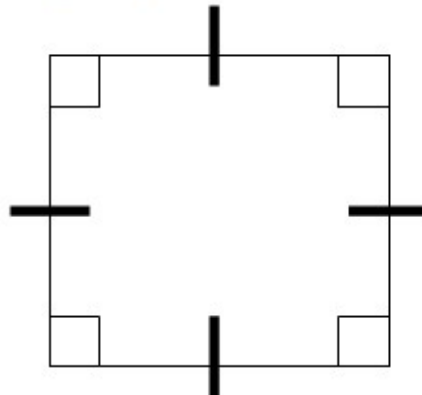
A \square with 4 \cong sides.



Square (sq.)

A rect. with 4 \cong sides.

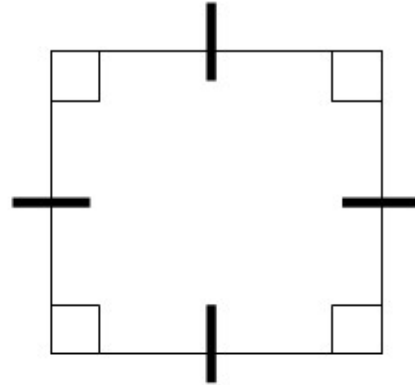
Write 2 more definitions of a square.



A rhombus with 4 Rt. \angle s.

A \square with 4 Rt. \angle s &

4 \cong sides.

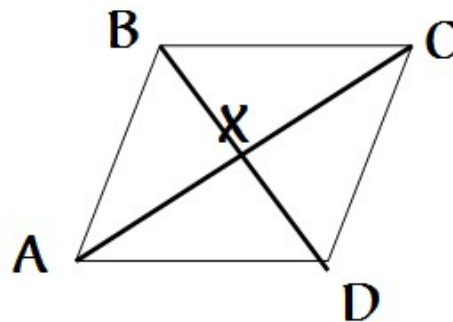


*** The diagonals of a rhombus are \perp .**

GIVEN: Rhombus ABCD w/diags.

\overline{AC} and \overline{BD}

PROVE: $\overline{AC} \perp \overline{BD}$



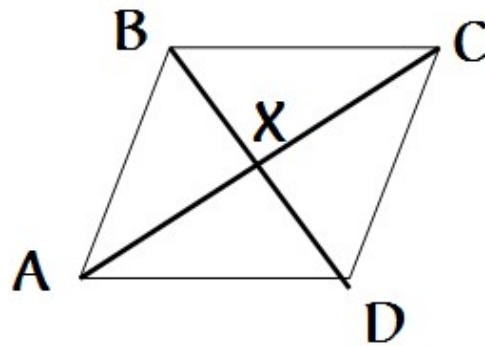
PROVE for homework

hint: prove $\triangle BXA \cong \triangle BXC$

*** If the diagonals of a \square are \perp ,
the \square is a rhombus.**

GIVEN: $\square ABCD$

$\overline{AC} \perp \overline{BD}$



PROVE: $\square ABCD$ is a rhombus

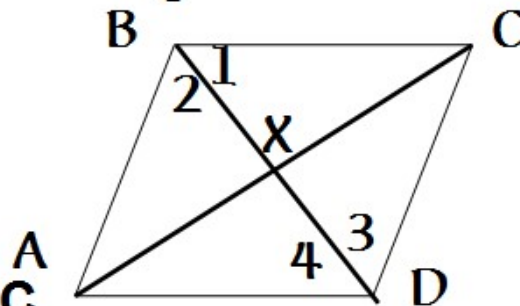
PROVE for homework

*** Each diagonal of a rhombus
bisects a pair of opp. \angle s.**

GIVEN: Rhombus ABCD w/diags.

\overline{AC} and \overline{BD}

**PROVE: \overline{BD} bisects
 $\angle ABC$ & $\angle ADC$**

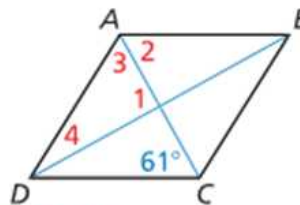


PROVE for homework

Find the measures of the numbered angles in rhombus $ABCD$.

SOLUTION

Use the Rhombus Diagonals Theorem and the Rhombus Opposite Angles Theorem to find the angle measures.



$m\angle 1 = 90^\circ$ The diagonals of a rhombus are perpendicular.

$m\angle 2 = 61^\circ$ Alternate Interior Angles Theorem (Theorem 3.2)

$m\angle 3 = 61^\circ$ Each diagonal of a rhombus bisects a pair of opposite angles, and $m\angle 2 = 61^\circ$.

$m\angle 1 + m\angle 3 + m\angle 4 = 180^\circ$ Triangle Sum Theorem (Theorem 5.1)

$90^\circ + 61^\circ + m\angle 4 = 180^\circ$ Substitute 90° for $m\angle 1$ and 61° for $m\angle 3$.

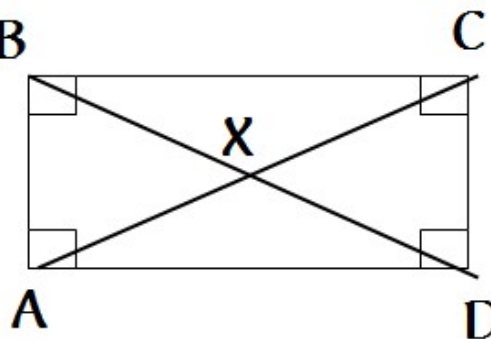
$m\angle 4 = 29^\circ$ Solve for $m\angle 4$.

*** The diagonals of a rect. are \cong**

GIVEN: Rect. ABCD w/diags.

\overline{AC} and \overline{BD}

PROVE: $\overline{AC} \cong \overline{BD}$

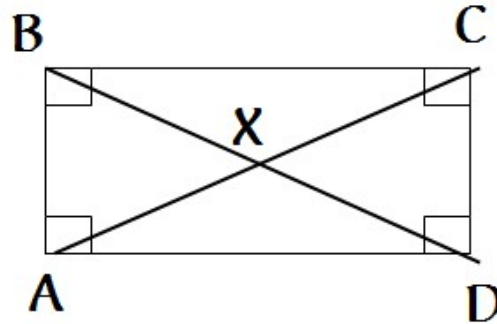


PROVE for homework

*** If the diagonals of a \square are \cong ,
the \square is a rect.**

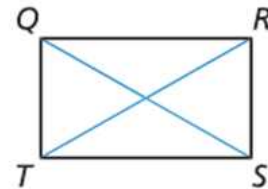
GIVEN: $\square ABCD$

$$\overline{AC} \cong \overline{BD}$$



PROVE: $\square ABCD$ is a rect.
PROVE for homework

In rectangle $QRST$, $QS = 5x - 31$ and $RT = 2x + 11$.
Find the lengths of the diagonals of $QRST$.



SOLUTION

By the Rectangle Diagonals Theorem, the diagonals of a rectangle are congruent. Find x so that $\overline{QS} \cong \overline{RT}$.

$$QS = RT$$

$$5x - 31 = 2x + 11$$

$$3x - 31 = 11$$

$$3x = 42$$

$$x = 14$$

Extra practice SJ pg. 214

In Exercises 3–5, the diagonals of rhombus $ABCD$ intersect at E . Given that $m\angle BCA = 44^\circ$, $AB = 9$, and $AE = 7$, find the indicated measure.

3. BC

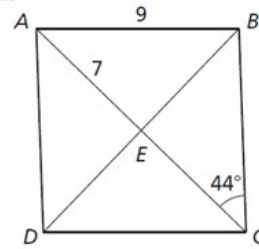
4. AC

5. $m\angle ADC$

9

14

92°



Extra practice SJ pg. 214

In Exercises 6–8, the diagonals of rectangle $EFGH$ intersect at I . Given that $m\angle HFG = 31^\circ$ and $EG = 17$, find the indicated measure.

6. $m\angle FHG$

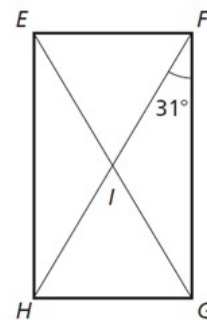
7. HF

8. $m\angle EFH$

59°

17

59°



Extra practice SJ pg. 214

In Exercises 9–11, the diagonals of square $LMNP$ intersect at K . Given that

$MK = \frac{1}{2}$, find the indicated measure.

9. PK

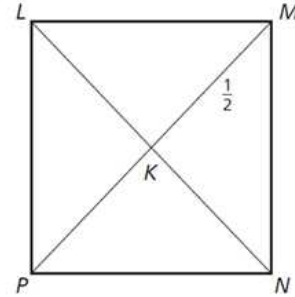
$$\frac{1}{2}$$

10. $m\angle PKN$

$$90^\circ$$

11. $m\angle MNK$

$$45^\circ$$



**Homework
worksheet prop. of rhombi
and prop. of rectangles**