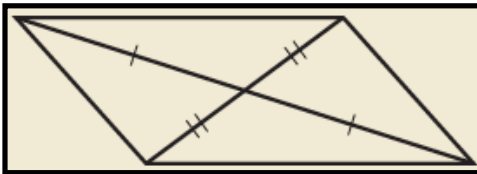


Bellwork

01/30/2012

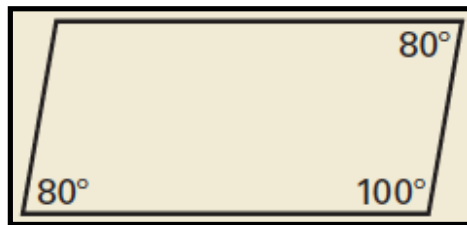
Tell how you know that the quadrilateral is a parallelogram.

1.



diagonals bisect
each other

2.



Theorem 8.8

Geometry
8.4 Properties of Rhombuses, Rectangles, and Squares
Standard(s): 3, 9

Vocabulary:

Rhombus: A parallelogram with 4 congruent sides.

Rectangle: A parallelogram with 4 right angles.

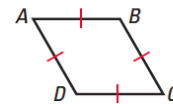
Square: A parallelogram with 4 congruent sides and 4 right angles.

COROLLARIES*For Your Notebook***RHOMBUS COROLLARY**

A quadrilateral is a rhombus if and only if it has four congruent sides.

$ABCD$ is a rhombus if and only if $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$.

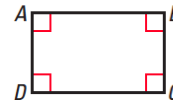
Proof: Ex. 57, p. 539

**RECTANGLE COROLLARY**

A quadrilateral is a rectangle if and only if it has four right angles.

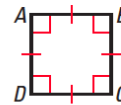
$ABCD$ is a rectangle if and only if $\angle A$, $\angle B$, $\angle C$, and $\angle D$ are right angles.

Proof: Ex. 58, p. 539

**SQUARE COROLLARY**

A quadrilateral is a square if and only if it is a rhombus and a rectangle.

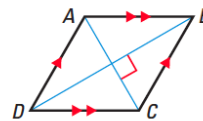
$ABCD$ is a square if and only if $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$ and $\angle A$, $\angle B$, $\angle C$, and $\angle D$ are right angles.

**THEOREMS***For Your Notebook***THEOREM 8.11**

A parallelogram is a rhombus if and only if its diagonals are perpendicular.

$\square ABCD$ is a rhombus if and only if $\overline{AC} \perp \overline{BD}$.

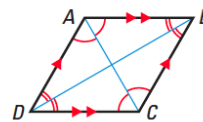
Proof: p. 536; Ex. 56, p. 539

**THEOREM 8.12**

A parallelogram is a rhombus if and only if each diagonal bisects a pair of opposite angles.

$\square ABCD$ is a rhombus if and only if \overline{AC} bisects $\angle BCD$ and $\angle BAD$ and \overline{BD} bisects $\angle ABC$ and $\angle ADC$.

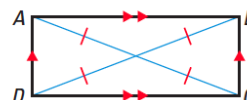
Proof: Exs. 60–61, p. 539

**THEOREM 8.13**

A parallelogram is a rectangle if and only if its diagonals are congruent.

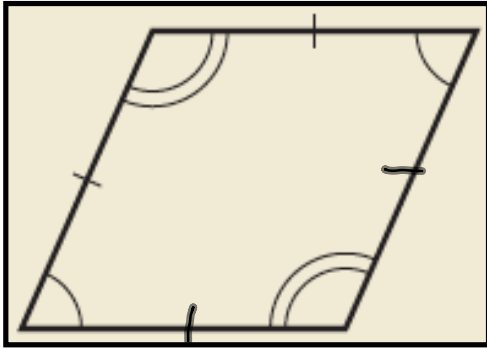
$\square ABCD$ is a rectangle if and only if $\overline{AC} \cong \overline{BD}$.

Proof: Exs. 63–64, p. 540

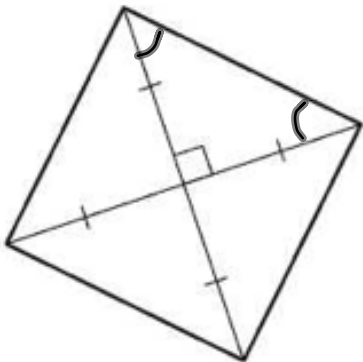


Classify a Quadrilateral

Classify the quadrilateral. Explain your reasoning.



Rhombus
It's a \square by thm 8.8
then all sides are \cong




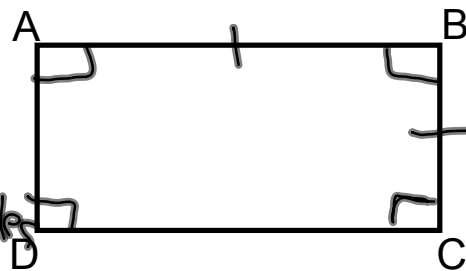
Square
Thm 8.11
Thm 8.13
Square corollary

Possible Qualities of Special Quad.

For any rectangle ABCD, decide whether the statement is always or sometimes true. Draw a diagram and explain your reasoning.

$$\overline{AB} \cong \overline{CD}$$

Always, all rectangles are , so opposite sides are \cong .

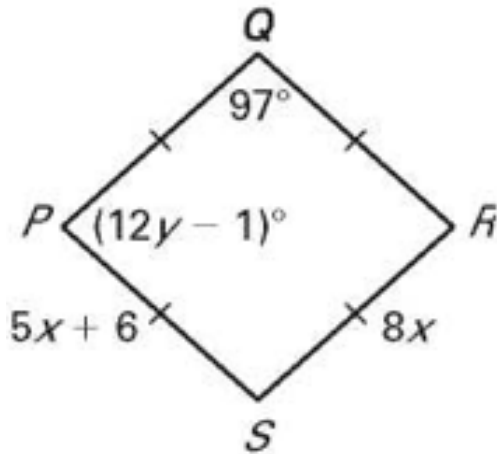


$$\overline{AB} \cong \overline{BC}$$

Sometimes,
Not all rectangles are squares.

Use Special Quad. to find Variables

Classify the special quadrilateral. *Explain* your reasoning. Then find the values of x and y .



Rhombus

$$5x + 6 = 8x$$

$$3x = 6$$

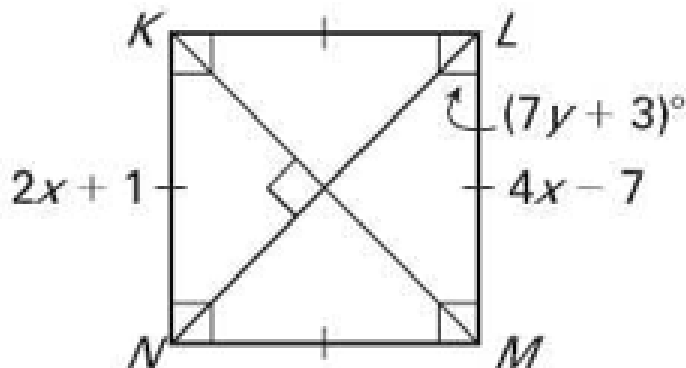
$$\boxed{x = 2}$$

$$12y - 1 + 97 = 180$$

$$12y + 96 = 180$$

$$12y = 84$$

$$\boxed{y = 7}$$



Square

$$2x + 1 = 4x - 7$$

$$8 = 2x$$

$$\boxed{x = 4}$$

$$7y + 3 = 45$$

$$7y = 42$$

$$\boxed{y = 6}$$

Use Properties of Special Quad.

The diagonal of rhombus WXYZ intersect at point V. Given that $m\angle XZY = 34^\circ$ and $WV = 7$, find the indicated measure.

$$m\angle WZV = 34^\circ$$

$$m\angle XYZ = 112^\circ$$

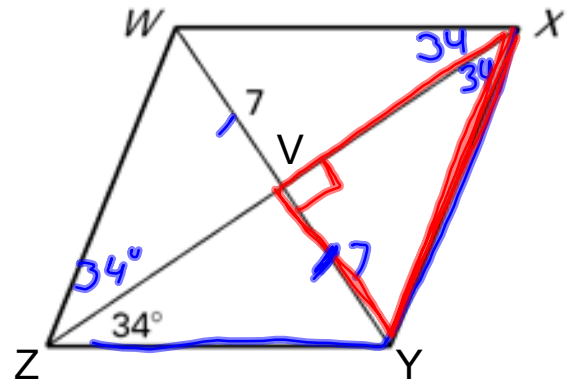
$$180 - 68 = 112^\circ$$

$$WY = 14$$

$$XY = \sin 34 = \frac{7}{XY}$$

$$XY = \frac{7}{\sin 34}$$

$$XY = 12.5$$



Homework Assignment

Worksheet 8.4B

Proving a Parallelogram

Describe how to prove that DEFG is a parallelogram.

