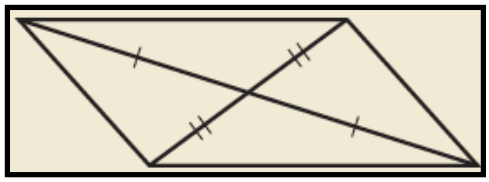
Bellwork
02/02/2012

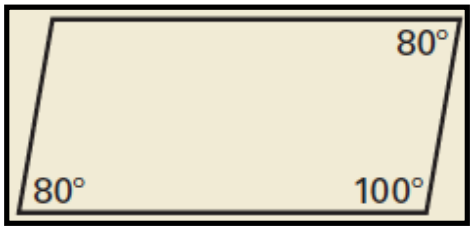
Tell how you know that the quadrilateral is a parallelogram.

1.



8.10

2.



8.8

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

Vocabulary:

Rhombus: A parallelogram with 4 congruent sides.

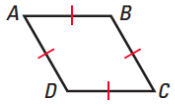
Rectangle: A parallelogram with 4 right angles.

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.

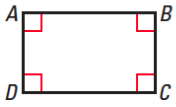


$ABCD$ is a rhombus if and only if $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$.

Proof: Ex. 57, p. 539

RECTANGLE COROLLARY

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

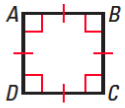


$ABCD$ is a rectangle if and only if $\angle A$, $\angle B$, $\angle C$, and $\angle D$ are right angles.

Proof: Ex. 58, p. 539

SQUARE COROLLARY

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

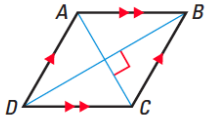


$ABCD$ is a square if and only if $\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$ and $\angle A$, $\angle B$, $\angle C$, and $\angle D$ are right angles.

THEOREMS *For Your Notebook*

THEOREM 8.11

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

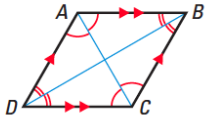


$\square ABCD$ is a rhombus if and only if $\overline{AC} \perp \overline{BD}$.

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.

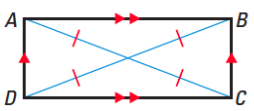


$\square ABCD$ is a rhombus if and only if $\overline{AC}$ bisects $\angle BCD$ and $\angle BAD$ and $\overline{BD}$ bisects $\angle ABC$ and $\angle ADC$.

Proof: Exs. 60–61, p. 539

THEOREM 8.13

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

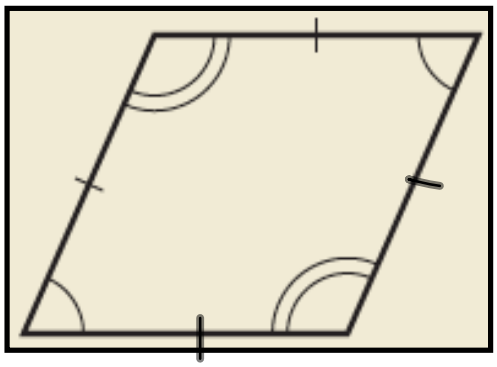


$\square ABCD$ is a rectangle if and only if $\overline{AC} \cong \overline{BD}$.

Proof: Exs. 63–64, p. 540

Classify a Quadrilateral

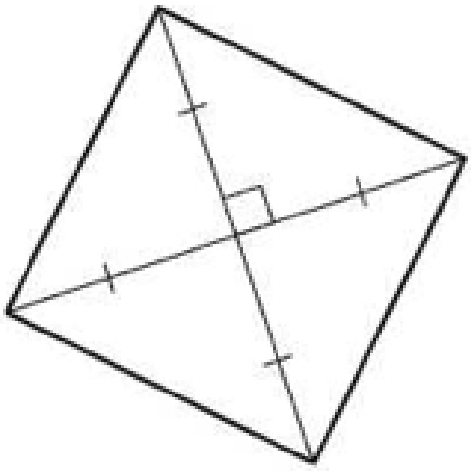
Classify the quadrilateral. Explain your reasoning.



Thm 8.8 - ▱

Thm 8.3 - sides are ≅

Rhombus Corollary



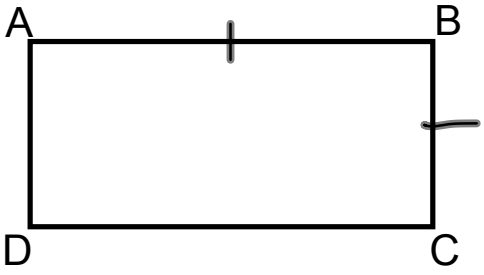
Thm 8.11 - rhombus

Thm 8.13 - rectangle

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, a rectangle is a  therefore thm 8.3.

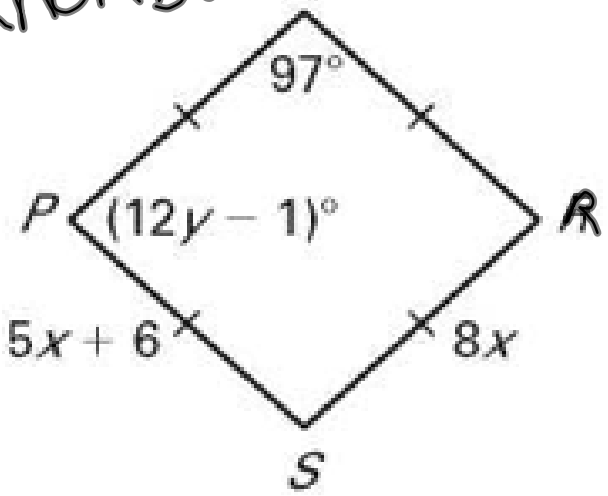
$\overline{AB} \cong \overline{BC}$

Sometimes, a rectangle is not always a square.

Use Special Quad. to find Variables

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

Rhombus Q



$12y - 1 + 97 = 180$

$12y + 96 = 180$

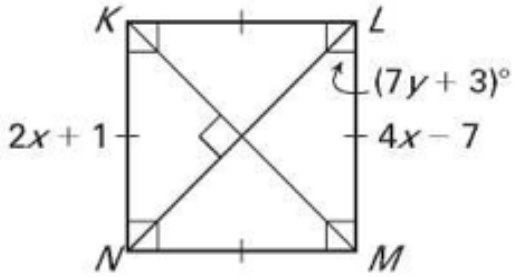
$12y = 84$

$\boxed{y = 7}$

$5x + 6 = 8x$

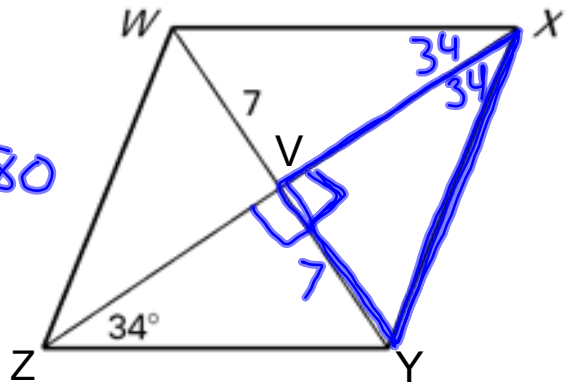
$3x = 6$

$\boxed{x = 2}$



Use Properties of Special Quad.

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



***m*∠WZV=** 34°

***m*∠XYZ=** 68° + mLXYZ = 180

112°

***WY*=** 14

***XY*=**

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

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

$XY \approx 12.5$

Homework Assignment

Worksheet 8.4B

Proving a Parallelogram

Describe how to prove that DEFG is a parallelogram.