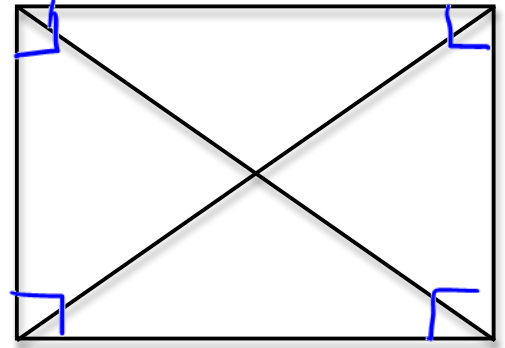


Math1312
Section 4.3
Rectangles

A rectangle is a **parallelogram**. Therefore, the properties of a parallelogram also apply to a rectangle.

- 1) Opposite sides are congruent (they equal each other).
- 2) Opposite angles are congruent (they equal each other).
- 3) Consecutive angles are supplementary (they add up to 180)
- 4) Diagonals bisect each other (they cut each other in half)
- 5) Diagonals are **congruent** (they equal each other)
- 6) All four angles are 90.



The last two are “special” properties of rectangles.

In-class Example 1:

Find the value of “x”

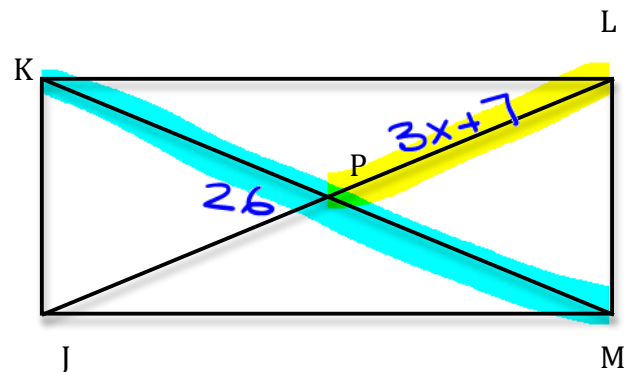
$$\begin{aligned} LP &= 3x + 7 \\ MK &= 26 \end{aligned}$$

$$2(3x + 7) = 26$$

$$3x + 7 = 13$$

$$3x = 6$$

$$x = 2$$



In-class Example 2:

Given rectangle **QRST** and parallelogram **QZRC**, find the values of x and y .

$$RZ = 6x$$

$$ZQ = 3x + 2y$$

$$CS = 14 - x$$

$$6x = 14 - x$$

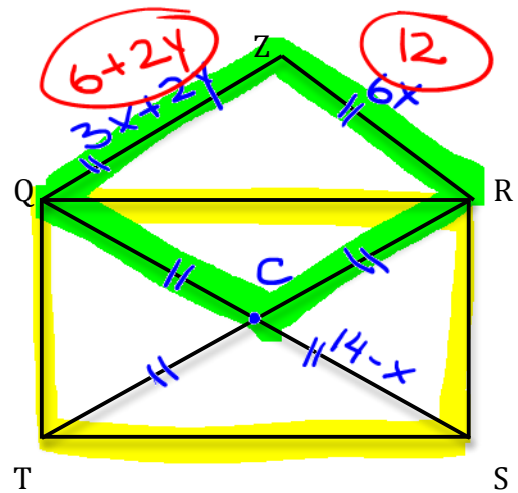
$$7x = 14$$

$$x = 2$$

$$6 + 2y = 12$$

$$2y = 6$$

$$y = 3$$



In-Class Example 3:

Find the measure of LN

$$LI = 3x - 2$$

$$MI = 2x + 3$$

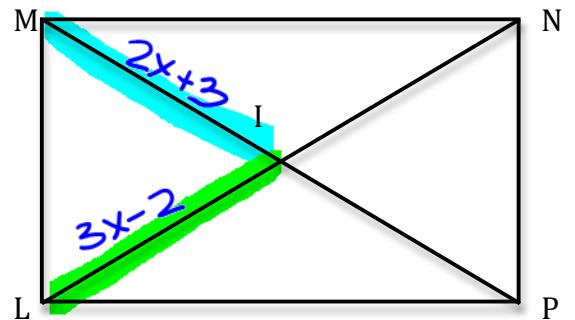
$$3x - 2 = 2x + 3$$

$$x - 2 = 3$$

$$x = 5$$

$$LI = 3(5) - 2 = 13$$

$$LN = 2 LI = 2(13) = 26$$



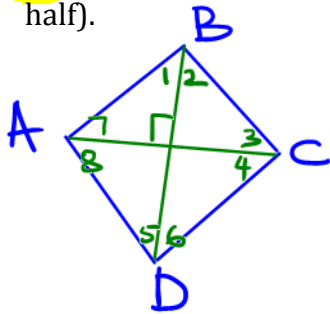
Squares and Rhombi

A square is a quadrilateral with 4 right angles and 4 congruent sides.

A rhombus is also a quadrilateral, but its characterized by 4 congruent sides; a rhombus does NOT have four congruent angles.

The properties of a parallelogram apply to both squares and rhombi. A rhombus however has two special properties:

- 1) The diagonals of a rhombus are perpendicular (they form right angles)
- 2) Each diagonal of a rhombus bisects a pair of opposite angles (the angles are cut in half).



$$1. \overline{BD} \perp \overline{AC}$$

$$2. \angle 1 \cong \angle 2$$

$$\angle 3 \cong \angle 4$$

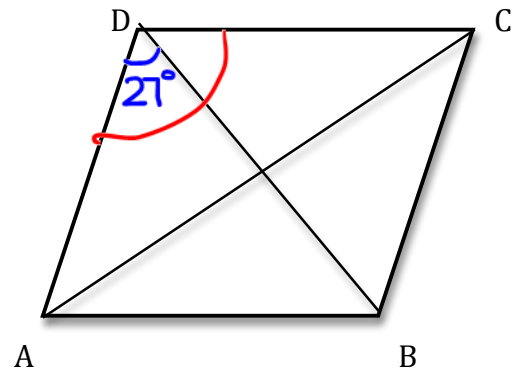
$$\angle 5 \cong \angle 6$$

$$\angle 7 \cong \angle 8$$

In-class Example 1:

ABCD is a rhombus. $m \angle ADB = 27^\circ$. Find the $m \angle ADC$.

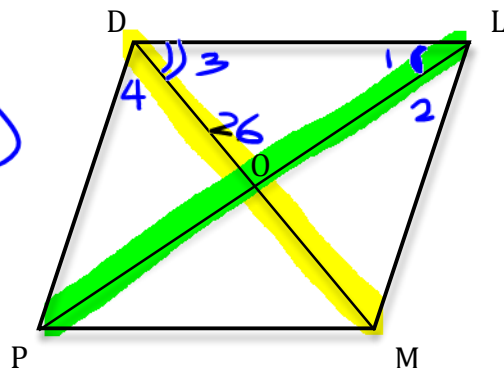
$$m \angle ADC = 2(27) = 54^\circ$$



In-Class Example 2:

Given rhombus DLMP, where $DM = 26$. Determine whether each statement is true or false. Justify each answer.

- a. $OM = 13$ YES, diagonals bisect each other
- b. $MD = PL$ NO (not a rectangle!)
- c. $m\angle DLO = m\angle LDO$ NO



In-Class Example 3:

Given rhombus PLAN. Answer each of the following:

- a. What type of triangle is $\triangle PLA$?

Isos.

- b. What type of triangle is $\triangle PEN$?

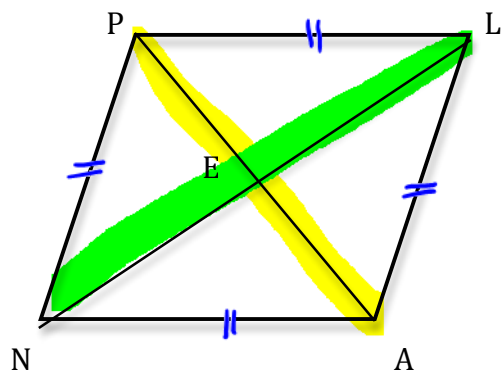
Scalene & Right

- c. Is $\triangle PEN \cong \triangle AEL$?

YES, SSS

- d. Is it true that $PA = NL$? Explain.

NO



Popper OA
a Es