

Warm-up

Solve

$$\textcircled{1} \quad 3x = 8x - 15$$

$+15 \quad -3x \quad -3x \quad +15$

$$\frac{15}{5} = \frac{5x}{5}$$

$$3 = x$$

$$\textcircled{2} \quad 6x + 3 = 8x - 14$$

$+14 \quad -6x$

$$17 = 2x$$

$$8.5 = x$$

$\textcircled{3}$ M is midpoint of \overline{AB} . $AM = 5x - 2$; $MB = 3x + 6$.

Find AB.



$$AM = MB$$

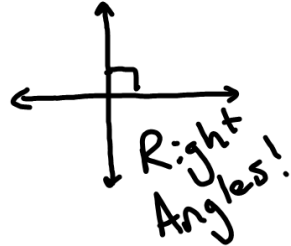
$$5x - 2 = 3x + 6$$

5.2 Perpendicular Bisector

Two things happening here:

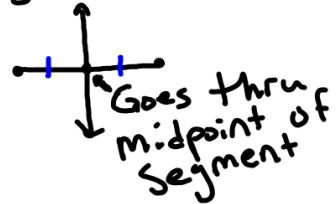
Perpendicular

lines intersect @ 90°



Bisector

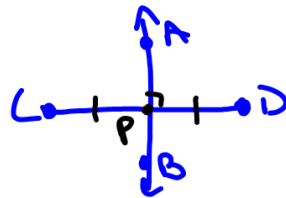
Cuts segment into 2 congruent parts



If \overleftrightarrow{AB} is a \perp bisector of \overline{CD} , then

1) $\overleftrightarrow{AB} \perp \overline{CD}$ form right angles (are \perp)

2) \overline{CD} is cut into 2 equal parts (is bisected)



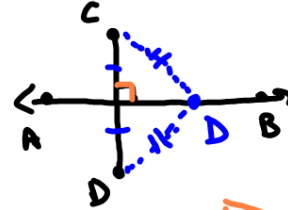
Equidistant - Equal distance.

ex. P is in middle of D & C

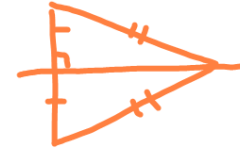


Perpendicular Bisector Thm

In a plane, if a point is on the \perp bisector, then it is equidistant from the endpoints of the bisected segment.

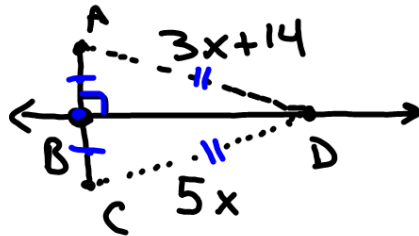


\perp bisector does the cutting in half.
So \overleftrightarrow{AB} is it!



Examples

① \overleftrightarrow{BD} is \perp bisector of \overline{AC} . Find \overline{AD} .

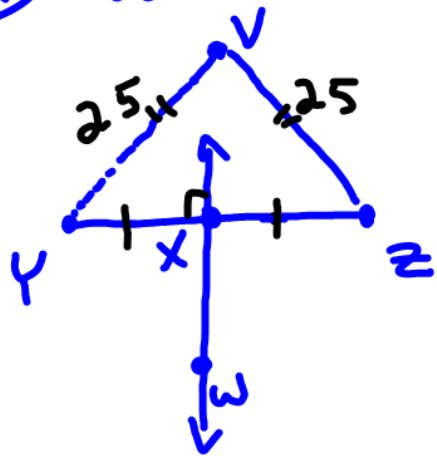


$$\text{So } \textcircled{AD} = \textcircled{CD}$$

$$3x+14 = 5x$$

$$7 = x$$

② \overleftrightarrow{WX} is \perp bis. of \overline{YZ} .



a) What segment lengths are equal?

$$YX = XZ, \quad VY = VZ$$

b) Is V on the \perp bis. \overleftrightarrow{WX} ? Yes
 because $\text{isos } \Delta$ w. th

$$\overline{VY} \cong \overline{VZ}$$