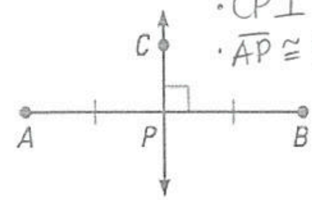
5.2 USE PERPENDICULAR BISECTORS

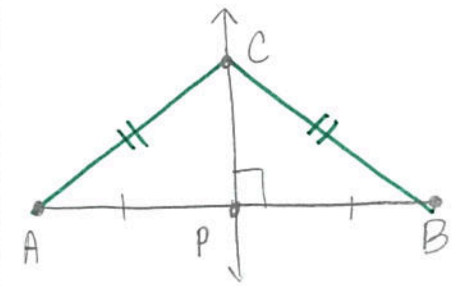
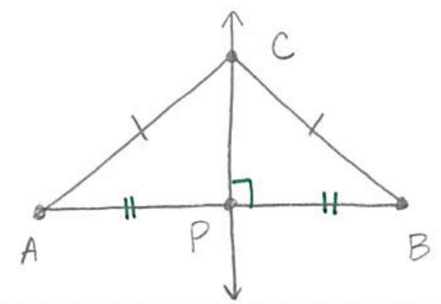
$\overleftrightarrow{CP}$ is ⊥ bisector of $\overline{AB}$
- $\overleftrightarrow{CP} \perp \overline{AB}$
- $\overline{AP} \cong \overline{PB}$



A segment, ray, line, or plane is a **perpendicular bisector** if it is perpendicular to a segment at its midpoint.

A point is **equidistant** from two figures if the point is the same distance from each figure.

Points on the perpendicular bisector of a segment are equidistant from the segment's endpoints.

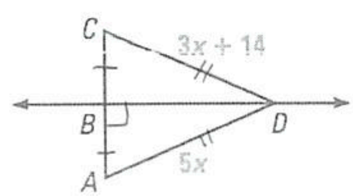
Perpendicular Bisector Theorem	In a plane, if a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment. if $\overleftrightarrow{CP}$ is ⊥ bisector of $\overline{AB}$, then $\overline{CA} \cong \overline{CB}$	
Converse of Perpendicular Bisector Theorem	In a plane, if a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment. if $\overline{CA} \cong \overline{CB}$ then $\overleftrightarrow{CP}$ is perp bisector of $\overline{AB}$	

Example 1

$\overline{BD}$ is the perpendicular bisector of $\overline{AC}$. Find AD.

$3x+14=5x$
$14=2x$
$7=x$

$AD=5(7)=\boxed{35 \text{ units}}$



Example 2

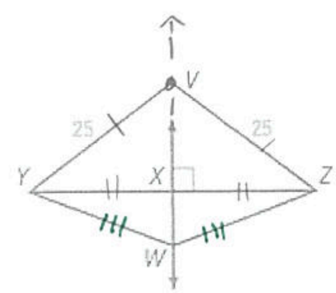
In the diagram, $\overline{WX}$ is the perpendicular bisector of $\overline{YZ}$.

a. What segment lengths in the diagram are equal?

$\overline{VY} \cong \overline{VZ}$ so $\overline{YX} \cong \overline{ZX}$ $\quad \overline{WY} \cong \overline{WZ}$ by ⊥ bisector thm

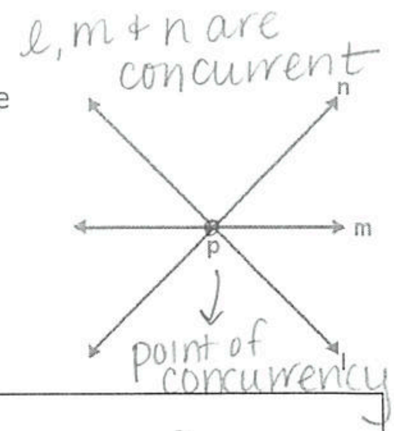
b. Is V on $\overline{WX}$?

yes by Converse of ⊥ Bisector Thm

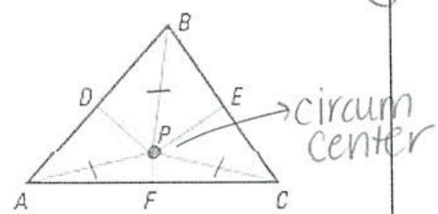


5.2 USE PERPENDICULAR BISECTORS

When three or more lines, rays, or segments intersect in the same point, they are called **concurrent** lines, rays, or segments.

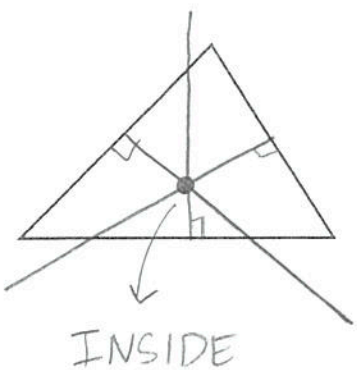


The intersection of the lines, rays, or segments is called the **point of concurrency.**

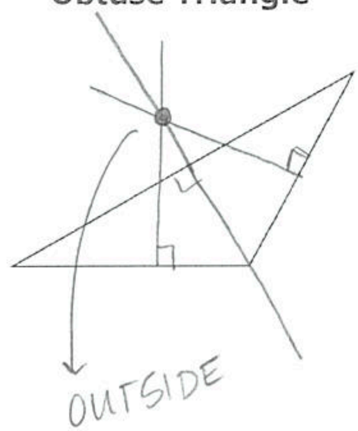
Concurrency of Perpendicular Bisectors of a Triangle	The perpendicular bisectors of a triangle intersect at a point that is equidistant from the vertices of the triangle. $\overline{DP}, \overline{EP}, \overline{FP}$ are $\perp$ bisectors so $\overline{PB} \cong \overline{PA} \cong \overline{PC}$	

The point of concurrency of the perpendicular bisectors of a triangle is called the **circumcenter** of the triangle.

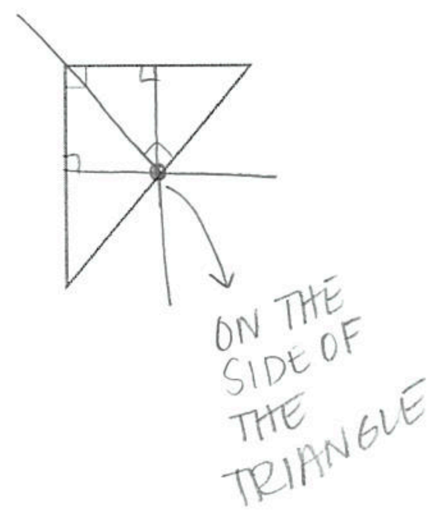
Acute Triangle



Obtuse Triangle



Right Triangle



Today's Homework: pg 306-307: 1 - 15, 24