

# Honors Geometry

## Notes Section 5.2

### Use Perpendicular Bisectors

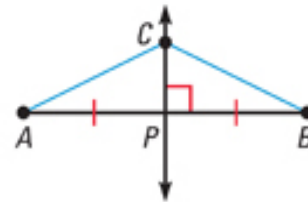
#### VOCABULARY

<b>Perpendicular Bisector:</b>	a segment, ray, line or plane that is perpendicular to a segment at its midpoint.
<b>Equidistant:</b>	same distance
<b>Concurrent:</b>	when 3 or more lines intersect at 1 point
<b>Point of Concurrency:</b>	the point of intersection of concurrent lines
<b>Circumcenter:</b>	the point of concurrency of the perpendicular bisectors

#### THEOREM 5.2 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.

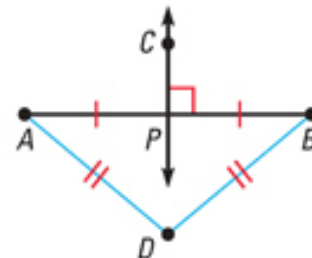
If  $\overleftrightarrow{CP}$  is the  $\perp$  bisector of  $\overline{AB}$ , then  $CA = CB$ .



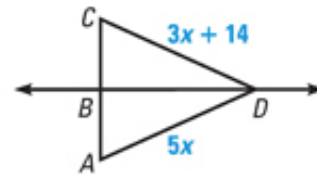
#### THEOREM 5.3 Converse of the Perpendicular Bisector Theorem

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  $DA = DB$ , then  $D$  lies on the  $\perp$  bisector of  $\overline{AB}$ .



**EXAMPLE 1**  $BD$  is the perpendicular bisector of  $AC$ . Find  $AD$ .



**EXAMPLE 2**  $WX$  is the perpendicular bisector of  $YZ$ .

a) What segments are congruent?

b) Is  $V$  on  $WX$ ?

**EXAMPLE 3** Three snack carts sell frozen yogurt from points  $A$ ,  $B$  and  $C$  outside a city. Each of the 3 carts is the same distance from the frozen yogurt distributor.

Find a location for the distributor that is equidistant from the 3 carts.