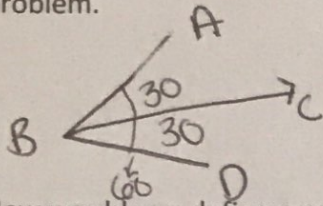


AIM: HOW DO WE CONSTRUCT A PERPENDICULAR BISECTOR?

Do Now:

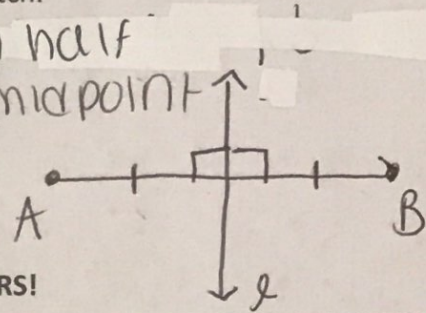
- Ray  $\overline{BC}$  bisects  $\angle ABD$ . If  $m\angle ABD$  is  $60^\circ$ , Find the  $m\angle ABC$  and  $m\angle CBD$ . Draw a diagram to assist in the problem.



$$60 \div 2 = \boxed{30^\circ}$$

- How would you define a perpendicular bisector? Provide a sketch.

a line that cuts a segment in half and forms  $90^\circ$  angles at the midpoint



PERPENDICULAR BISECTORS!

STEPS	CONSTRUCTION
<ol style="list-style-type: none"> <li>Place the compass on one point of the line segment and adjust the compass to just over half the line length.</li> <li>Without adjusting the compass width, draw an arc on each side of the line.</li> <li>Repeat from the other endpoint of the line. <b>YOU SHOULD SEE 2 POINTS OF INTERSECTION!</b></li> <li>Using your straight edge, connect a line through the two points of intersection</li> </ol>	

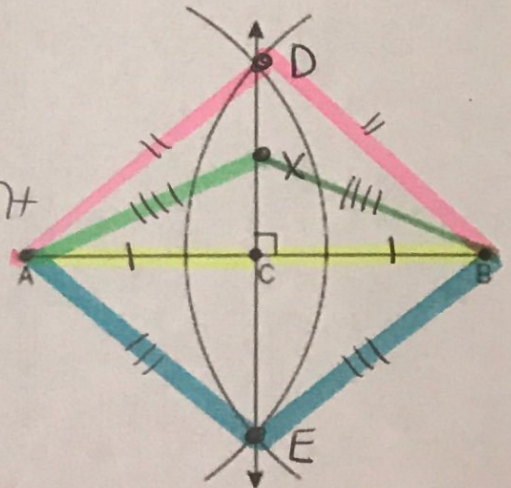
CONCLUSIONS:

- $\overline{AC} \cong \overline{CB}$
- $\overline{AD} \cong \overline{BD}$
- $\overline{AE} \cong \overline{BE}$
- $\overline{AX} \cong \overline{BX}$

\*check w/ compass\*

any point along the  $\perp$  bisector is equidistant from the endpoints of the segment

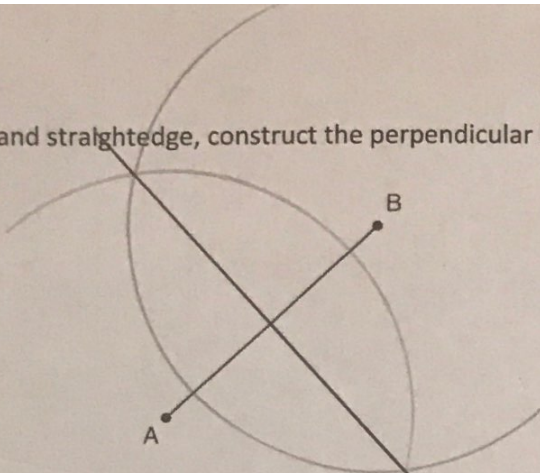
\* $\angle ACD = \angle BCD = \angle BCE = \angle ACE = 90^\circ$   
 4 right angles



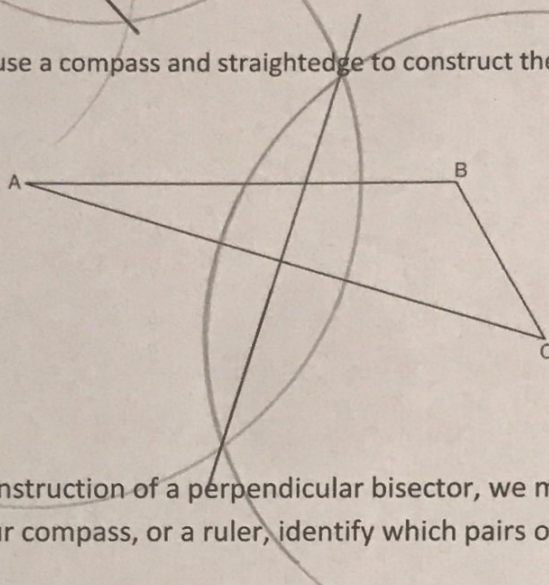
\*WHEN IN DOUBT, DRAW THE TROUT!\*

**PRACTICE:**

1. Using a compass and straightedge, construct the perpendicular bisector of  $\overline{AB}$  shown below. Show all construction marks.

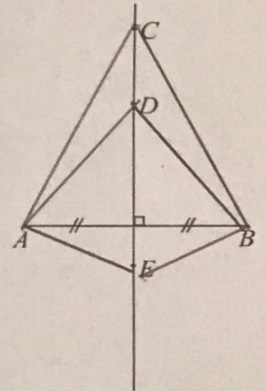


2. On the diagram of  $\triangle ABC$  shown below, use a compass and straightedge to construct the perpendicular bisector of  $\overline{AC}$ . [Leave all construction marks.]

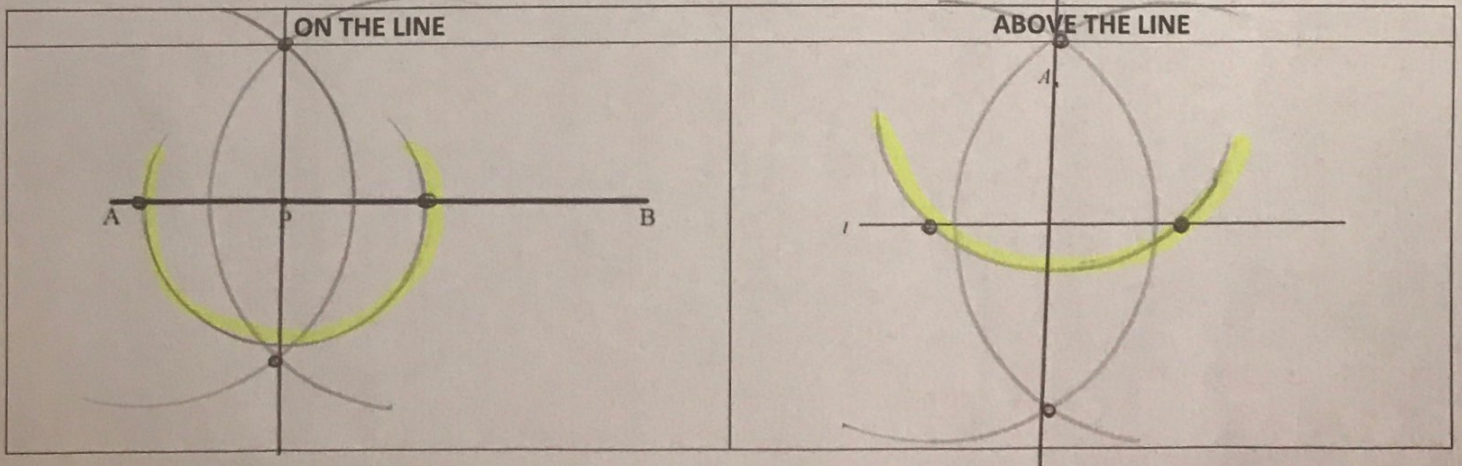


3. Now that you are familiar with the construction of a perpendicular bisector, we must make one last observation. Using your compass, or a ruler, identify which pairs of segments are equal.

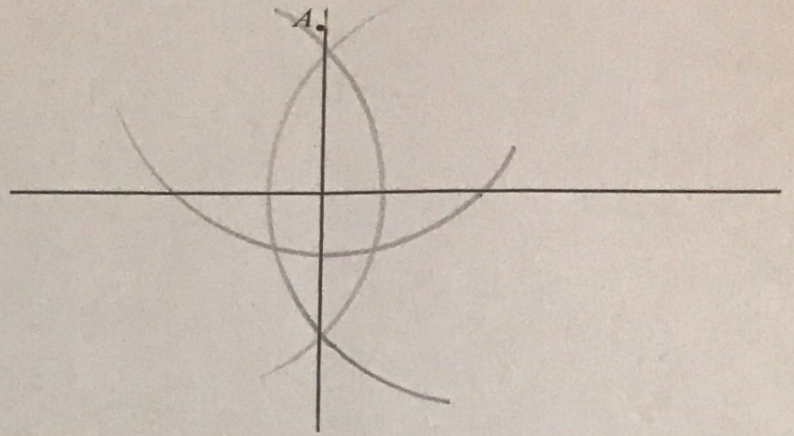
$$\begin{aligned} \overline{AC} &\cong \overline{BC} \\ \overline{AD} &\cong \overline{BD} \\ \overline{AE} &\cong \overline{BE} \end{aligned}$$



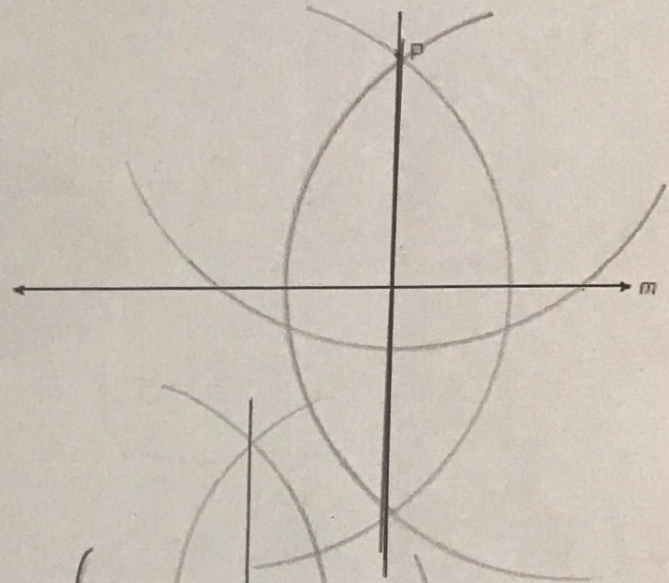
WHAT IF THE PERPENDICULAR BISECTOR IS TO BE CONSTRUCTED THROUGH A SPECIFIC POINT? **\*SEMI-CIRCLE!\***



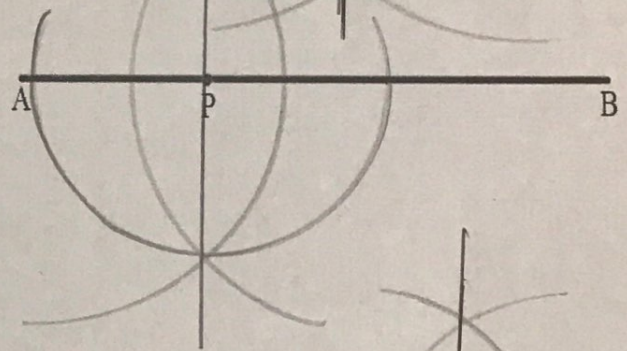
4. Construct a perpendicular bisector to a line  $\ell$  from a point  $A$  not on  $\ell$ .



5. Using a compass and straightedge, construct a line perpendicular to  $m$  through point  $P$ . [Leave all construction marks.]



6. Using a compass and straightedge, construct a line perpendicular to  $\overline{AB}$  through point  $P$ . [Leave all construction marks.]



7. Using a compass and straightedge, construct a line perpendicular to  $\overline{AB}$  through point  $P$ . [Leave all construction marks.]

