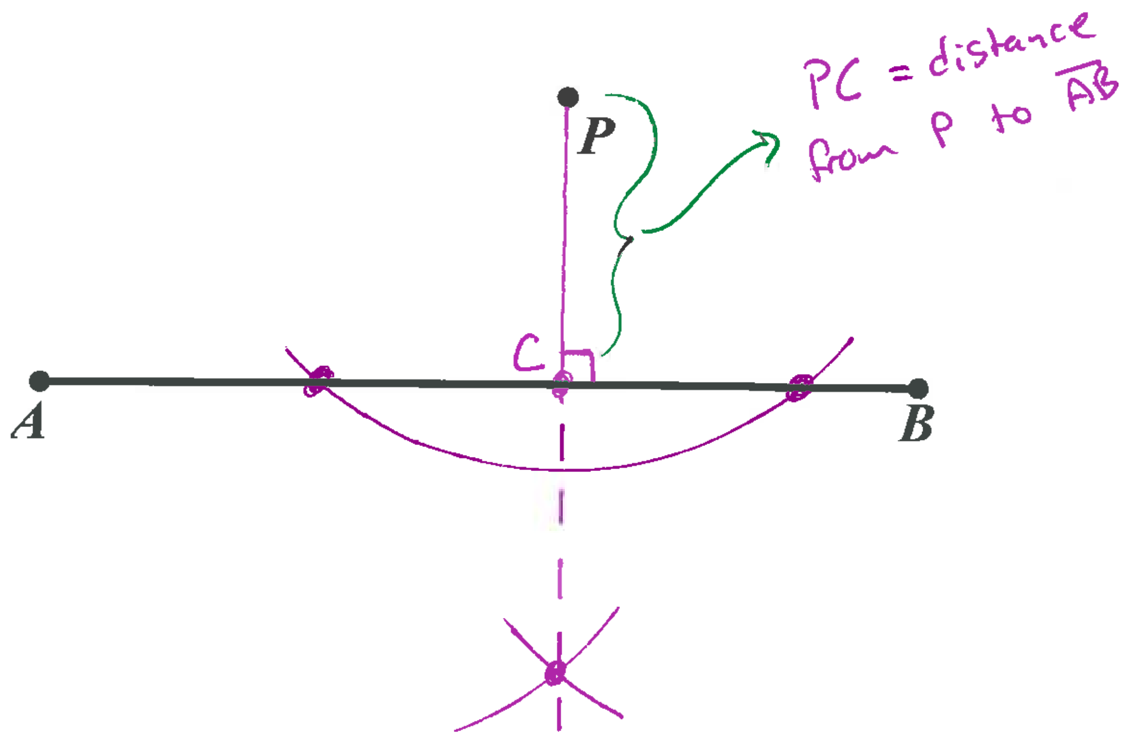
Geometry
Unit 5 – Day 2 Notes

Name________________________

Using a compass and straight edge, construct a line perpendicular to $\overline{AB}$ through point P.



Definition: The distance from a point (P) to a line ($\overline{AB}$) is…

the length of the segment that is ⊥ to the line
from the point.

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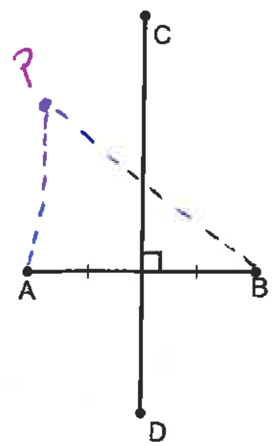
Perpendicular Bisector Theorem

perpendicular bisector.

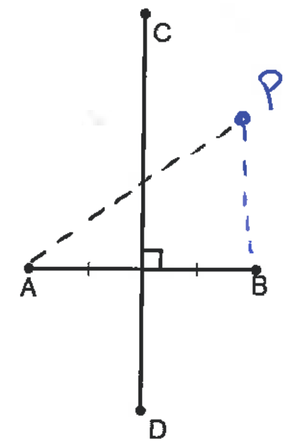
In each picture $\overline{CD}$ is the $\perp$ bisector of $\overline{AB}$. How do AP and BP compare?

Picture 1



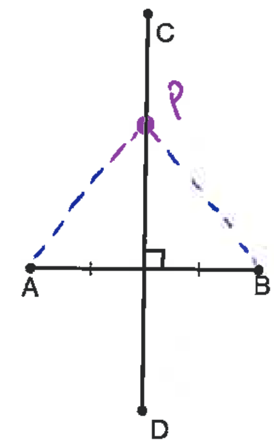
AP < BP

Picture 2



AP > BP

Picture 3



AP = BP

Theorem: A point on the $\perp$ bisector of a segment is equidistant to the endpoints of the segment.

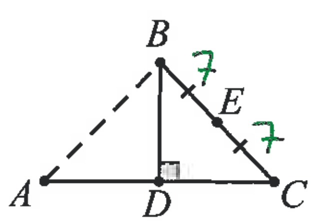
Converse: A point equidistant to the endpoints of a segment is on the $\perp$ bisector of the segment.

Example: $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$. → $\overline{AB} \cong \overline{BC}$

E is the midpoint of $\overline{BC}$

EC = 7

Find $\overline{AB}$



$AB = BC$

$= BE + EC$

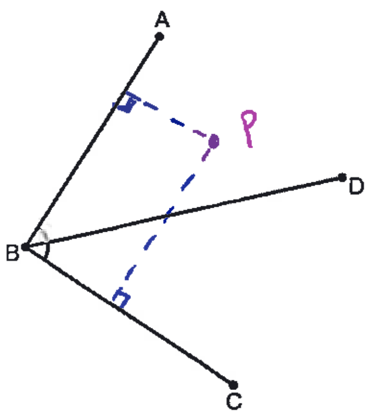
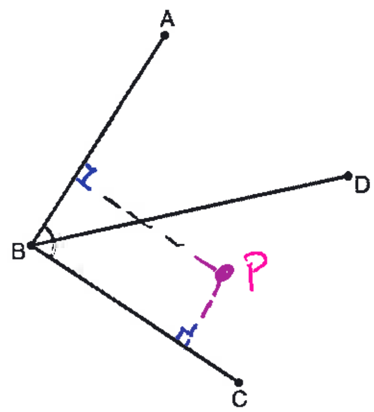
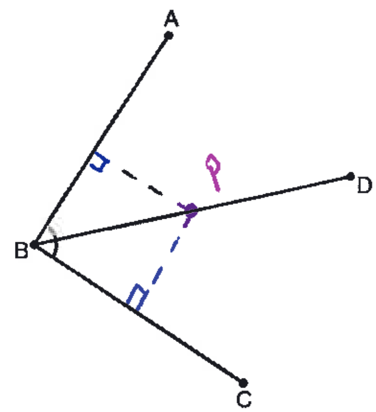
$= 7 + 7$

$= 14$

angle bisector

Angle Bisector Theorem

In each picture $\overline{BD}$ bisects $\angle ABC$. Point P is closest to which side of $\angle ABC$?

Picture 1	Picture 2	Picture 3
		
P is closest to: $\overline{AB}$	P is closest to: $\overline{BC}$	P is closest to: neither (it's equidistant)

Theorem: A point on the angle bisector is equidistant to the sides of the angle.

Converse: A point equidistant to the sides of an angle is on the angle bisector.

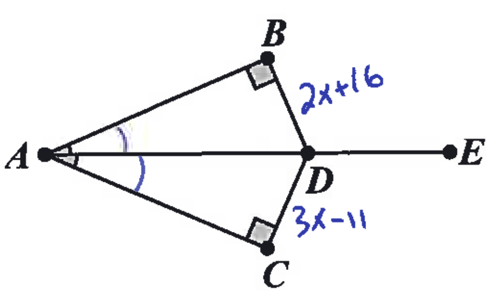
Example:

Given: ADE bisects ∠BAC → $\overline{BD} \cong \overline{CD}$

BD = 2x+16

CD = 3x-11

Find x.



BD = CD

2x+16 = 3x-11

27 = x