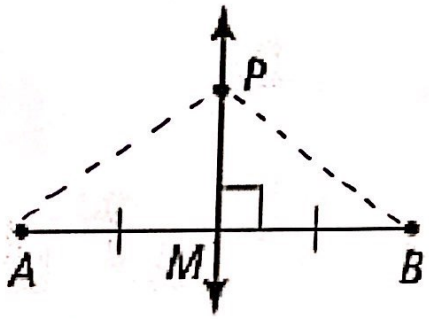
Day 2 - Perpendicular and Angle Bisectors of Triangles – Notes

If you remember from Day 1, perpendicular bisectors are lines, line segments, or rays that intersect at the midpoint of a line segment at a 90 degree angle.

Perpendicular Bisector Theorem: If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.

If: $\overleftrightarrow{PM}$ perpendicularly bisects $\overline{AB}$

Then: $\overline{PA} \cong \overline{PB}$

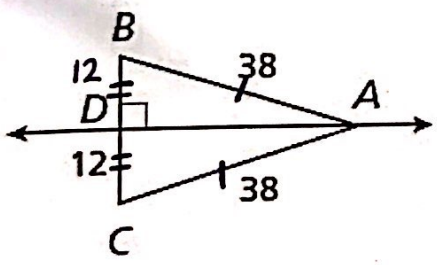


Converse of the Perpendicular Bisector Theorem: If a point is equidistant from the endpoints of the segment, then it is on the perpendicular bisector of the segment.

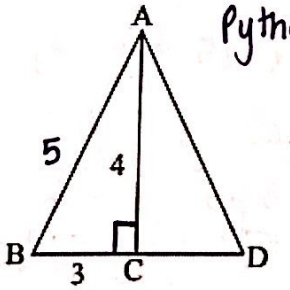
If $\overline{PA} \cong \overline{PB}$, then P is on the perpendicular bisector of $\overleftrightarrow{PM}$

Practice:

A. Find BC. BC = 24



B. Find AD if AC is the perpendicular bisector to BD.



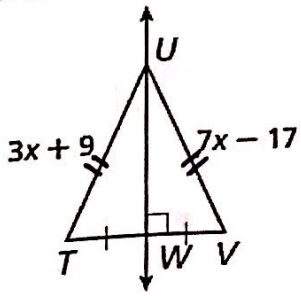
Pythagorean Theorem

$3^2 + 4^2 = c^2$

$25 = c^2$

$\boxed{5 = c}$

C. Find TU



$7x - 17 = 3x + 9$

$4x - 17 = 9$

$4x = 26$

$x = 6.5$

$TU = 3(6.5) + 9$

$\boxed{TU = 28.5}$

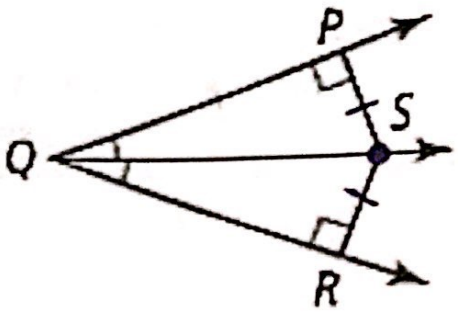
Angle Bisectors of Triangles

Angle Bisector Theorem: If a point is on the biesctor of an angle, then the point is equidistant from the sides of the angle.

If:

S is on the angle bisector $\overrightarrow{QS}$

Then: $\overline{PS} \cong \overline{RS}$

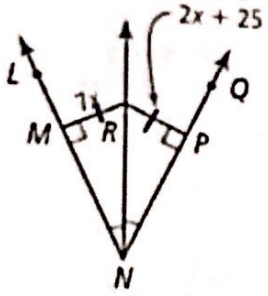


Converse of the Angle Bisector Theorem: If a point in the interior of an angle is equidistant from the sides of the angle, then the point is on the angle bisector.

If $\overline{PS} \cong SR$, then S is on the angle bisector $\overrightarrow{QS}$

Practice:

a. b. What is the length of RM?



$7x = 2x + 25$

$5x = 25$

$\boxed{x = 5}$