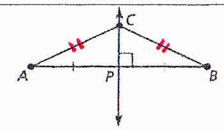
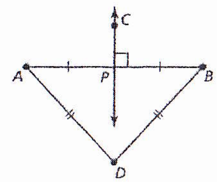
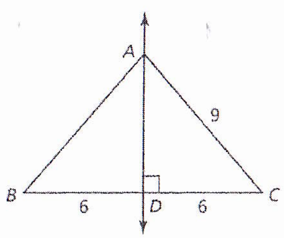
NOTES: 6.1 – Perpendicular and Angle Bisectors

Objective: ______________________________

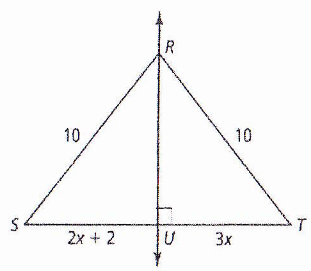
Equidistant: the same distance from

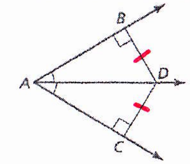
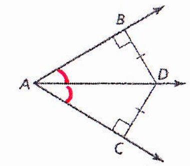
THEOREM	DIAGRAM
PERPENDICULAR BISECTOR THEOREM In a plane, if a point lies on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.	 **If $\overleftrightarrow{CP}$ is the $\perp$ bisector of $\overline{AB}$, then** $\overline{CA} \cong \overline{CB}$.
CONVERSE OF THE PERPENDICULAR BISECTOR THEOREM In a plane, if a point is equidistant from the endpoints of a segment, then it lies on the perpendicular bisector of the segment.	 **If $DA = DB$, then point D lies on the $\perp$ bisector of** $\overline{AB}$.

Example 1:
Find AB and explain your reasoning.

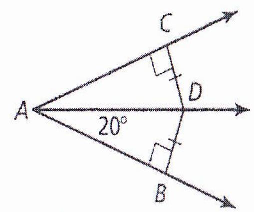


Example 2:
Find SU and explain your reasoning.

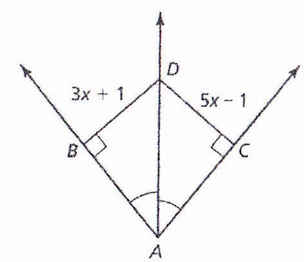


THEOREM	DIAGRAM
ANGLE BISECTOR THEOREM If a point lies on the bisector of an angle, then it is equidistant from the two sides of the angle.	 **If $\overrightarrow{AD}$ bisects $\angle BAC$ and $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$, then** $\overline{BD} \cong \overline{DC}$.
CONVERSE OF THE ANGLE BISECTOR THEOREM If a point is in the interior of an angle and is equidistant from the two sides of the angle, then it lies on the bisector of the angle.	 **If $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$ and $DB = DC$, then $\overrightarrow{AD}$ bisects** $\angle BAC$.

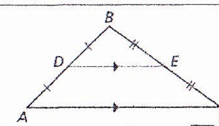
Example 3:
Find $m\angle CAB$ and explain your reasoning.



Example 4:
Find BD and explain your reasoning.

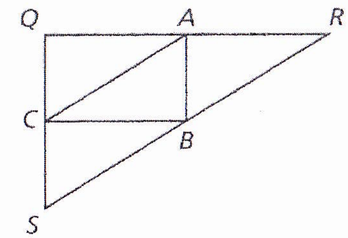


NOTES 6.4 – TRIANGLE MIDSEGMENT THEOREM

THEOREM	DIAGRAM
TRIANGLE MIDSEGMENT THEOREM The segment connecting the midpoints of two sides of a triangle is parallel to the third side and is half as long as that side.	 $\overline{DE}$ is a midsegment of ΔABC, $\overline{DE} \parallel \overline{AC}$, and DE = $\frac{1}{2}AC$.

EXAMPLES:

In Examples 1–6, use ΔQRS where *A*, *B*, and *C* are the midpoints of the sides.



1. **When** $AB = 16$, **what is** QS?
2. **When** $SR = 68$, **what is** CA?
3. **When** $SR = 46$, **what is** BR?
4. **When** $CA = 3x - 1$ and $SR = 5x + 4$, **what is** CA?
5. **When** $QS = 6x$ and $CS = 5x - 8$, **what is** AB?
6. **When** $m\angle BCA = 48°$, **what is the** $m\angle CAQ$?

11/3/16