Perpendicular Bisectors

Perpendicular: _____

Bisector: _____

Theorems

Theorem 6.1 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.

Picture:

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

Theorem 6.2 Converse of the Perpendicular Bisector Theorem

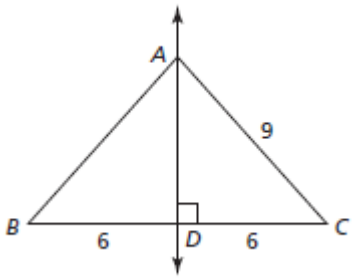
In a plane, if a point is equidistant from the endpoints of a segment, then it lies on the perpendicular bisector of the segment.

Picture:

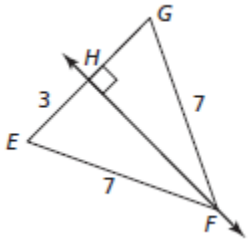
If $DA = DB$, then point D lies on the $\perp$ bisector of $\overline{AB}$.

Examples:

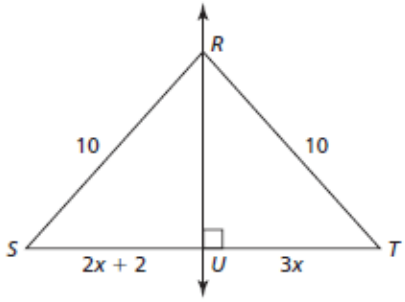
1)Find AB



2)Find EG



3)Find SU



Angle Bisectors

Theorem 6.3 Angle Bisector Theorem

If a point lies on the bisector of an angle, then it is equidistant from the two sides of the angle.

Picture:

If $\overrightarrow{AD}$ bisects $\angle BAC$ and $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$, then $DB = DC$.

Theorem 6.4 Converse of the Angle Bisector Theorem

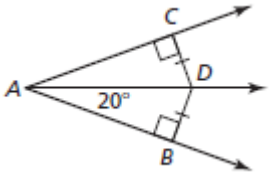
If a point is in the interior of an angle and is equidistant from the two sides of the angle, then it lies on the bisector of the angle.

Picture:

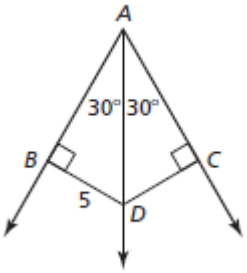
If $\overline{DB} \perp \overrightarrow{AB}$ and $\overline{DC} \perp \overrightarrow{AC}$ and $DB = DC$, then $\overrightarrow{AD}$ bisects $\angle BAC$.

Examples:

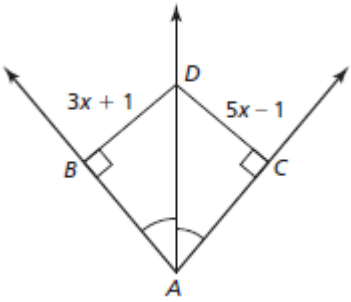
1)Find m∡CAB



2)Find CD

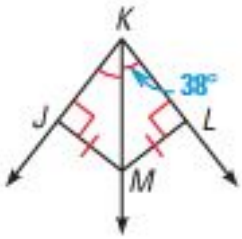


3) Find BD

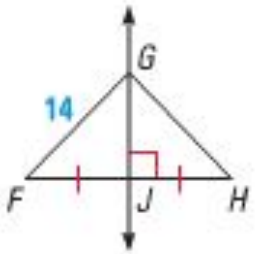


Practice:

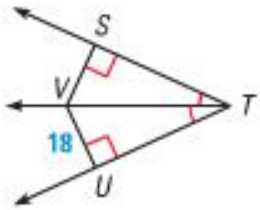
1. Find m∠ JKL



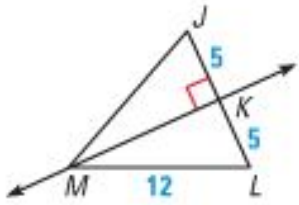
2. Find HG



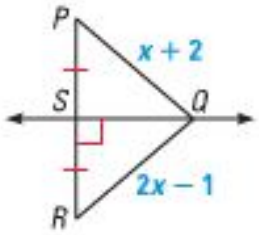
3. Find SV



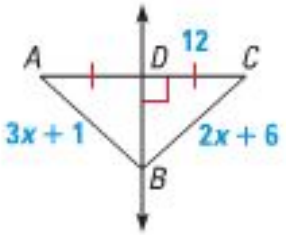
4. Find JM



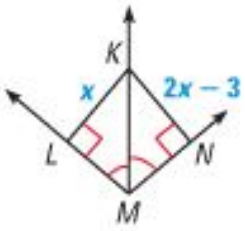
5. Find PQ



6. Find AD and BC



7. Find LK



8. Find EF