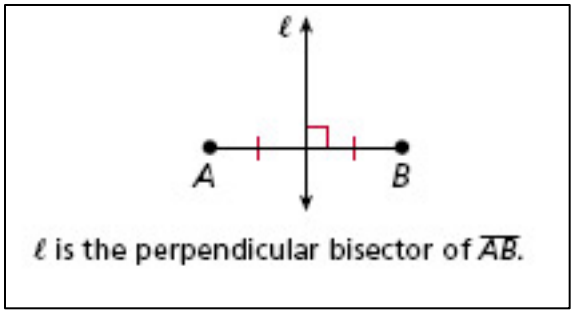
5.1 Perpendicular and Angle Bisectors **Name** _____

Review:

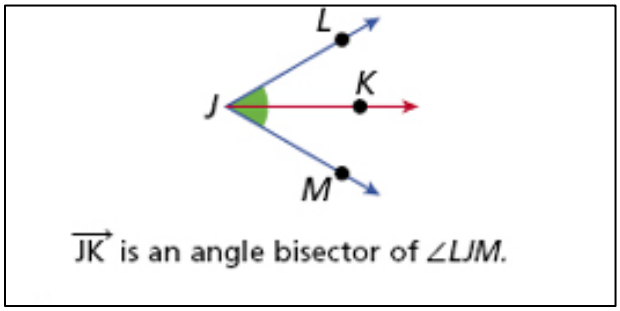
Perpendicular Bisector: A line _____ to a segment at its _____.



ℓ is the perpendicular bisector of $\overline{AB}$.

You try: Draw $\overline{OK}$. Draw line M that that is the perpendicular bisector of $\overline{OK}$.

Angle Bisector: A _____ that divides an angle into two congruent _____.

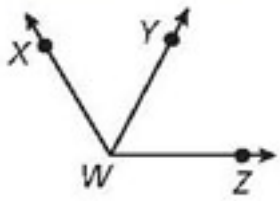


$\overrightarrow{JK}$ is an angle bisector of $\angle LJM$.

You try: Draw $\angle ABC$. Draw $\overrightarrow{BX}$ that is the angle bisector.

Equidistant: When a point is the same _____ from two or more objects.

Angle Review:

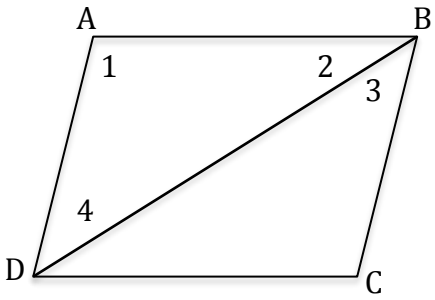


1) Name three angles in the picture: _____ _____ _____

2) If $\overrightarrow{WY}$ bisects $\angle XWZ$, then which two angles are congruent? _____

3) Draw obtuse $\angle CAT$. Draw the angle bisector $\overrightarrow{AS}$. Which two angles are congruent? _____

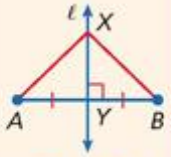
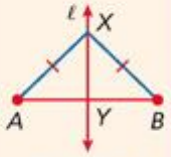
4) Name the numbered angles:



***The middle letter of an angle represents the _____!

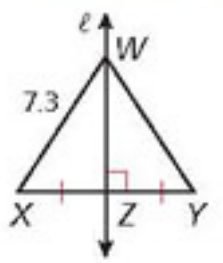
Perpendicular Bisector Theorem:

Theorems Distance and Perpendicular Bisectors

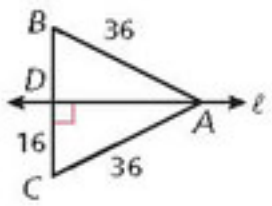
THEOREM	HYPOTHESIS	CONCLUSION
5-1-1 Perpendicular Bisector Theorem If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.	 $\overline{XY} \perp \overline{AB}$ $\overline{YA} \cong \overline{YB}$	$XA = XB$
5-1-2 Converge of the Perpendicular Bisector Theorem If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.	 $XA = XB$	$\overline{XY} \perp \overline{AB}$ $\overline{YA} \cong \overline{YB}$

Examples:

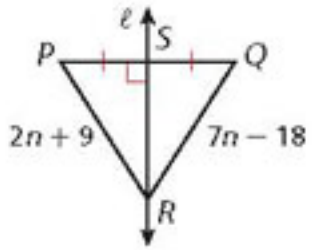
1) YW = _____



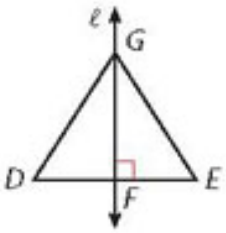
2) BC = _____



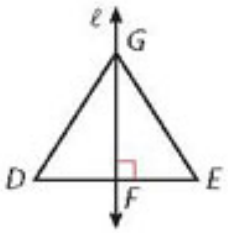
3) PR = _____



4) Given that line l is the perpendicular bisector of $\overline{DE}$ and EG = 14.6, then DG = _____.

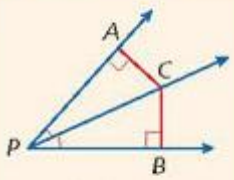
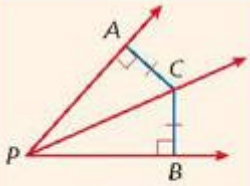


5) Given that DE = 20.8, DG = 36.4, and E EG = 36.4, then EF = _____.



Angle Bisector Theorem:

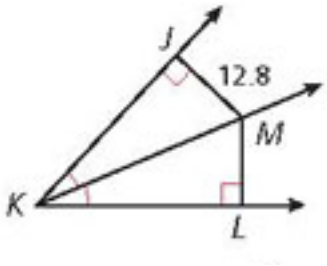
Theorems Distance and Angle Bisectors

THEOREM	HYPOTHESIS	CONCLUSION
5-1-3 Angle Bisector Theorem If a point is on the bisector of an angle, then it is equidistant from the sides of the angle.	 $\angle APC \cong \angle BPC$	$AC = BC$
5-1-4 Converse of the Angle Bisector Theorem If a point in the interior of an angle is equidistant from the sides of the angle, then it is on the bisector of the angle.	 $AC = BC$	$\angle APC \cong \angle BPC$

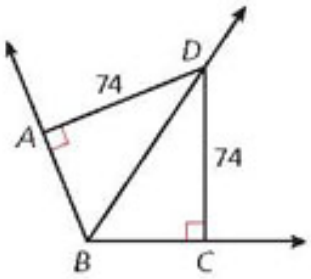
**Remember: The distance between a point and a line is the length of the _____ segment from the point to the line.

Examples:

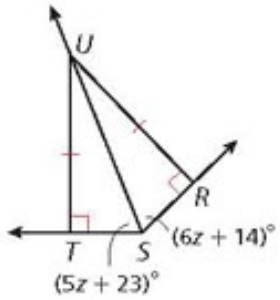
1) LM = _____



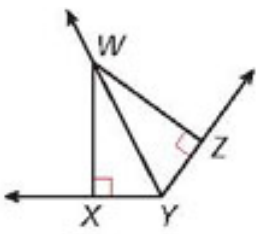
2) If $m\angle ABC = 112^0$, then $m\angle ABD =$ _____



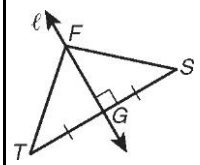
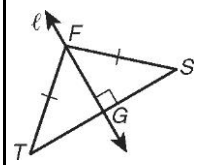
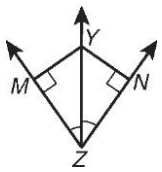
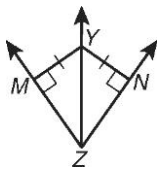
3) $m\angle TSU =$ _____



4) Given that $m\angle WYZ = 63^o$, XW = 5.7, and ZW = 5.7, then $m\angle XYZ =$ _____.

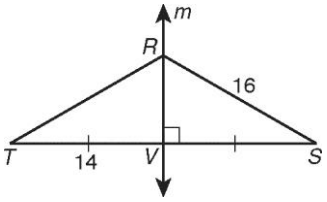


Summary:

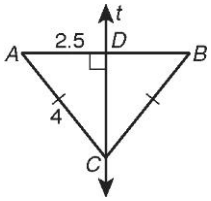
Theorem	Example	Conclusion
Perpendicular Bisector Theorem If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.		
Converse of the Perpendicular Bisector Theorem If a point is equidistant from the endpoints of a segment, then it is on the perpendicular bisector of the segment.		
Angle Bisector Theorem If a point is on the bisector of an angle, then it is equidistant from the sides of the angle.		
Converse of the Angle Bisector Theorem If a point in the interior of an angle is equidistant from the sides of the angle, then it is on the bisector of the angle.		

Practice:

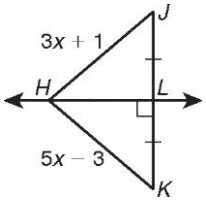
Find each measure.



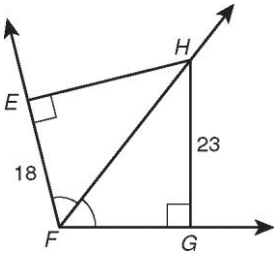
1. RT = _____



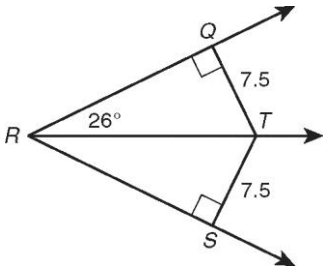
2. AB = _____



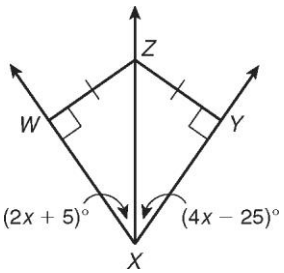
3. HJ = _____



4. EH = _____



5. m∠QRS = _____

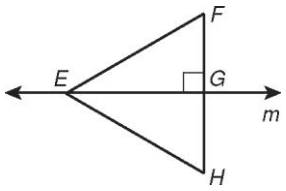


6. m∠WXZ = _____

5.1 Practice B **Name** _____

Perpendicular Bisectors and Angle Bisectors **Date** _____

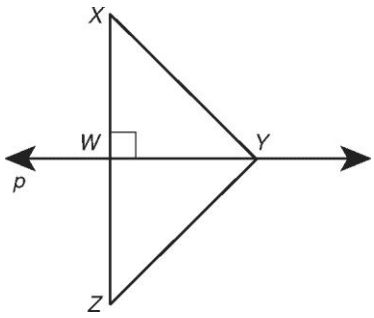
Use the figure for #1-2.



1. Given that line *m* is the perpendicular bisector of $\overline{FH}$ and $EH = 100$, find *EF.* _____

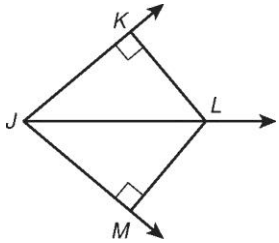
2. Given that $EF = 13$, $FH = 10$, and $EH = 13$, find *GH.* _____

Use the figure for #3-6.



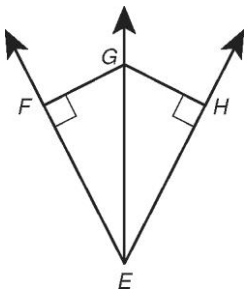
3. Given that line *p* is the perpendicular bisector of $\overline{XZ}$ and $XY = 15.5$, find *ZY.* _____
4. Given that $XZ = 38$, $YX = 27$, and $YZ = 27$, find *ZW.* _____
5. Given that line *p* is the perpendicular bisector of $\overline{XZ}$; $XY = 4n$, and $YZ = 14$, find *n*. _____
6. Given that $XY = ZY$, $WX = 6x - 1$, and $XZ = 10x + 16$, find *ZW*. _____

Use the figure for Exercises #7-8.



7. Given that $\overline{JL}$ bisects $\angle KJM$ and $KL = 42$, find *ML.* _____
8. Given that $KL = 4$ and $ML = 4$ and $m\angle MJL = 40^o$, find $m\angle KJL$. _____

Use the figure for Exercises #9-12.



9. Given that $FG = HG$ and $m\angle FEH = 56^o$, find $m\angle GEH$. _____
10. Given that $\overline{EG}$ bisects $\angle FEH$ and $GF = \sqrt{2}$, find *GH.* _____
11. Given that $\angle FEG \cong \angle GEH$, $FG = 10z - 30$, and $HG = 7z + 6$, find *FG.* _____
12. Given that $GF = GH$, $m\angle GEF = 8a^o$, and $m\angle GEH = 24^o$, find *a*. _____