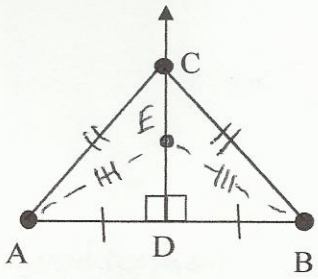
5-2 Bisectors in Triangles

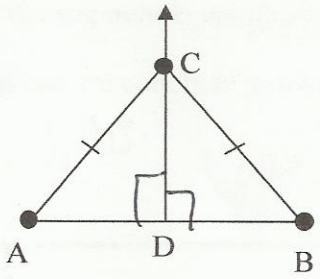
Perpendicular Bisector Theorem: If a point is on the perpendicular bisector of a segment, then it is equidistant from the endpoints of the segment.



Would AC = BC? Yes (C is on the ⊥ bisector of AB, equidistant from A and B.

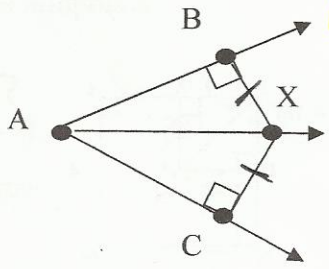
If you identified a point on $\overline{CD}$, call it point E, would EA = EB? YES

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.



What can you conclude about the relationship between segment CD and segment AB? CD is the ⊥ bisector of AB

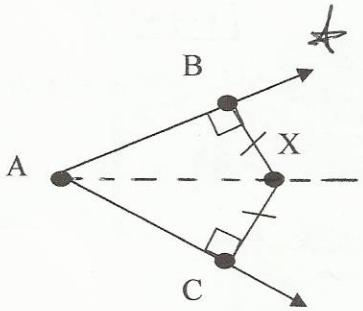
Angle Bisector Theorem: If a point is on the bisector of an angle, then the point is equidistant from the sides of the angle.



* distance from a point to a line is ⊥ to the line.

between the sides

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.

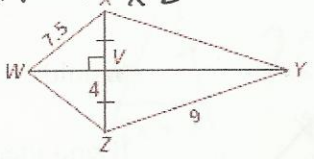


* $\overline{AX}$ is the bisector of ∠BAC

Practice 5-2

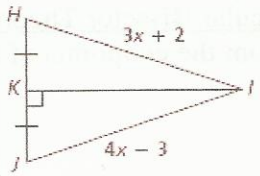
Bisectors in Triangles

Use the figure at the right for Exercises 1–5.



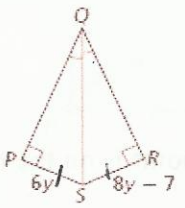
1. How is $\overline{WY}$ related to $\overline{XZ}$? $\overline{WY}$ is the ⊥ bisector of $\overline{XZ}$
2. Find XV. 4
3. Find WZ. 7.5
4. Find XY. 9
5. What kind of triangle is $\triangle WXY$? right

Use the figure at the right for Exercises 6–10.



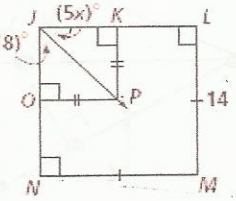
6. Find the value of x. 5 $3x+2 = 4x-3$, $2 = x-3$, $x = 5$
7. Find HI. 17
8. Find JI. 17
9. If L lies on $\overline{KI}$, then L is ? from H and J. Equidistant
10. What kind of triangle is $\triangle HIJ$? Isosceles

Use the figure at the right for Exercises 11–14.



11. Find the value of y. 3.5 $8y - 7 = 6y$, $-7 = -2y$, $y = \frac{7}{2}$
12. Find PS. 21
13. Find RS. 21
14. What kind of triangle is $\triangle POS$? right

Use the figure at the right for Exercises 15–21.



15. How is $\overline{JP}$ related to $\angle LJN$? angle bisector
16. Find the value of x. 9 $5x = 3x + 18$, $2x = 18$, $x = 9$
17. Find $m\angle KJP$. 45°
18. Find $m\angle OJP$. 45°
19. Find NM. 14
20. Write a conclusion about point M. It lies on $\overrightarrow{JP}$
21. What kind of triangle is $\triangle JOP$? right