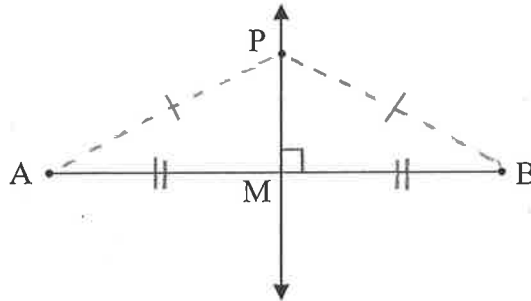


Honors Geometry  
Section 5.2 Notes  
Perpendicular and Angle Bisectors

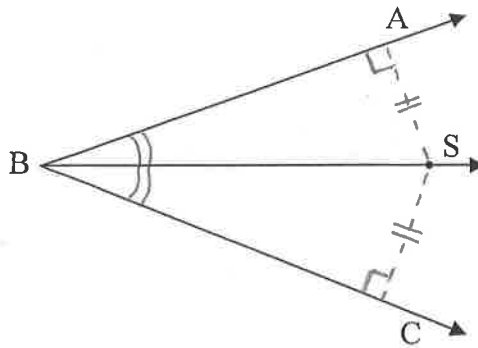
Name: Key

**Key Definitions:**

**Perpendicular Bisector Theorem** – If a point,  $P$  is on the perpendicular bisector of a segment,  $AB$  then it is equidistant from the endpoints of the segment.



**Angle Bisector Theorem** – If a point,  $S$  is on the bisector of an angle, then the point is equidistant from the sides of the angle.



**\*\*The distance from a point to a line is measured by the length of the perpendicular segment from the point to the line. (This is the only way to keep it consistent!)**

**Practice Problems**

Use the figure on the right to answer the following questions.

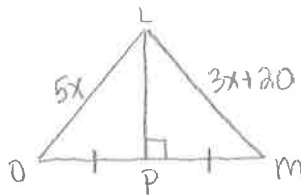
1. What is the relationship between  $\overline{LN}$  and  $\overline{MO}$ ?

*Perpendicular Bisectors*

2. What is the value of  $x$ ?

$$5x = 3x + 20$$

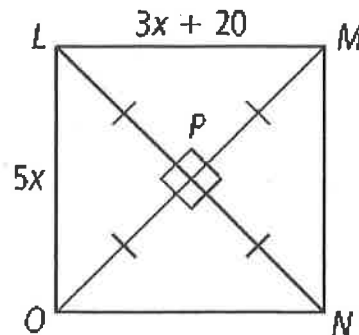
$$2x = 20 \quad \boxed{x=10}$$



3. Find  $LM$  and  $LO$ .

$$LM = 3(10) + 20 = \boxed{50}$$

$$LO = 5(10) = \boxed{50}$$



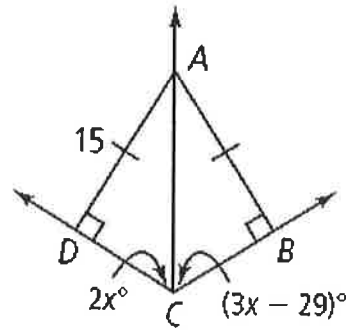
Use the figure on the right to answer the following questions.

1. According to the figure, how far is  $A$  from  $\overline{CD}$ ? from  $\overline{CB}$ ?

(15) (15)

2. How is  $\overrightarrow{CA}$  related to  $\angle DCB$ ? Explain.

Bisector b/c point  $A$  is equidistant from  $\overline{DC}$  and  $\overline{BC}$ .



3. Find the value of  $x$ .

$$2x = 3x - 29$$

$$x = 29$$

4. Find  $m\angle ACD$  and  $m\angle ACB$ .

$$m\angle ACD = 2(29) = 58$$

$$m\angle ACB = 3(29) - 29 = 58$$

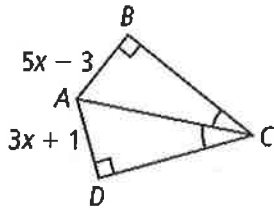
5. Find  $m\angle DAC$  and  $m\angle BAC$ .

$$m\angle DAC = 180 - 90 - 58 = 32$$

$$m\angle BAC = 180 - 90 - 58 = 32$$

Find the indicated variables and measures in the following figures.

1.  $x$ ,  $BA$ ,  $DA$



$$5x - 3 = 3x + 1$$

$$2x = 4$$

$$x = 2$$

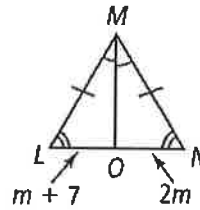
$$BA = 5(2) - 3$$

$$= 7$$

$$DA = 3(2) + 1$$

$$= 7$$

2.  $m$ ,  $LO$ ,  $NO$



$$m + 7 = 2m$$

$$m = 7$$

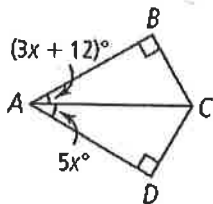
$$LO = (7) + 7$$

$$= 14$$

$$NO = 2(7)$$

$$= 14$$

3.  $x$ ,  $m\angle DAB$



$$3x + 12 = 5x$$

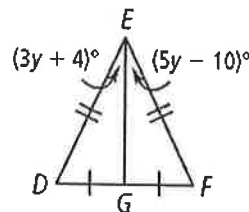
$$2x = 12$$

$$x = 6$$

$$m\angle DAB = 3(6) + 12 + 5(6)$$

$$= 60$$

4.  $y$ ,  $m\angle DEF$



$$3y + 4 = 5y - 10$$

$$2y = 14$$

$$y = 7$$

$$m\angle DEF = 3(7) + 4 + 5(7) - 10$$

$$= 50$$