

## Bell Work

A landscape architect wants to plant a circle of flowers around a triangular garden. She has sketched the triangle on a coordinate grid with vertices at  $A(0, 0)$ ,  $B(8, 12)$ , and  $C(18, 0)$ .

Find the circumcenter for triangle ABC (pg. 370)

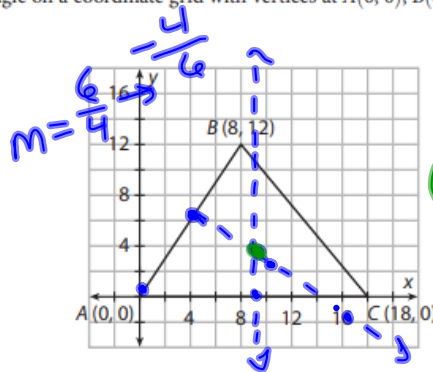
Perp. Bisectors

$(90^\circ)$

Spl: in half

★ Opp. Rec. Slope

★ Midpoint



$(9, 3)$

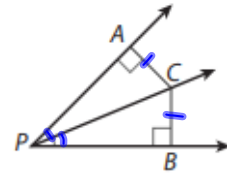
$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = \left( \frac{0 + 18}{2}, \frac{0 + 0}{2} \right) = (9, 0)$$

## 8.2 Angle Bisectors of Triangles

### Angle Bisector Theorem

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

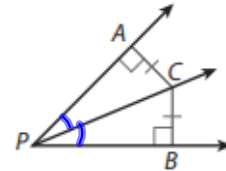
$\angle APC \cong \angle BPC$ , so  $AC = BC$ .



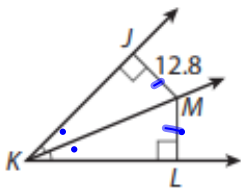
### Converse of the Angle Bisector Theorem

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.

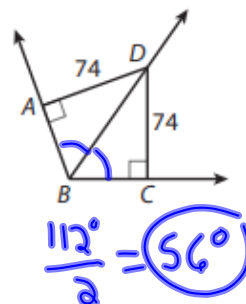
$AC = BC$ , so  $\angle APC \cong \angle BPC$



(A)  $LM = 12.8$



(B)  $m\angle ABD$ , given that  $m\angle ABC = 112^\circ$

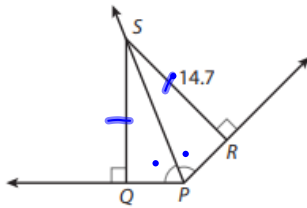


pg. 373 examples

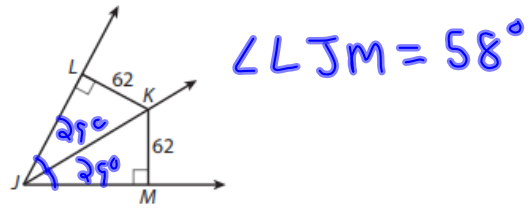
Your Turn

Find each measure.

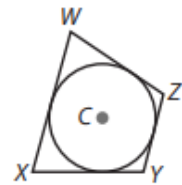
4.  $QS = 14.7$



5.  $m\angle LJM$ , given that  $m\angle KJM = 29^\circ$

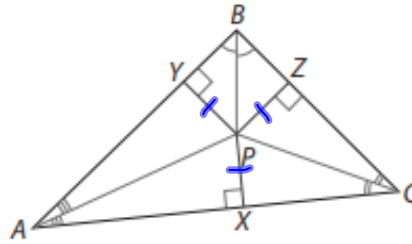


A circle is **inscribed** in a polygon if each side of the polygon is tangent to the circle. In the figure, circle C is inscribed in quadrilateral WXYZ and this circle is called the **incircle (inscribed circle)** of the quadrilateral.



### Incenter Theorem

The angle bisectors of a triangle intersect at a point that is equidistant from the sides of the triangle.



$$PX = PY = PZ$$

**Example 3**  $\overline{JV}$  and  $\overline{KV}$  are angle bisectors of  $\triangle JKL$ . Find each measure.

pg. 374

- (A) the distance from  $V$  to  $\overline{KL}$

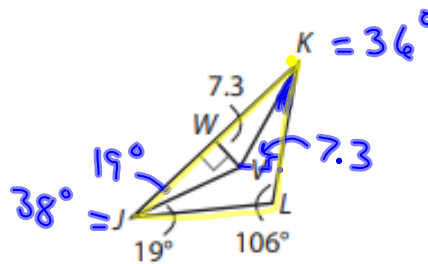
7.3

- (B)  $m\angle VKL$

$$38 + 106 = 144^\circ$$

$$180 - 144 = 36^\circ$$

$$\frac{36}{2} = 18^\circ$$



**Your Turn**

$\overline{QX}$  and  $\overline{RX}$  are angle bisectors of  $\triangle PQR$ . Find each measure.

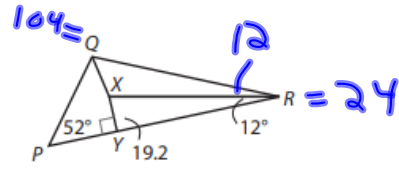
8. the distance from  $X$  to  $\overline{PQ}$

$$19.2$$

9.  $m\angle PQX$

$$52 + 24 = 76$$

$$\frac{180 - 76}{2} = 52^\circ$$



Homework

pg. 376-377 # 4-5, 8-15