6.2.2 Incenter

Tuesday, September 5, 2017 1:18 PM

What You Will Learn

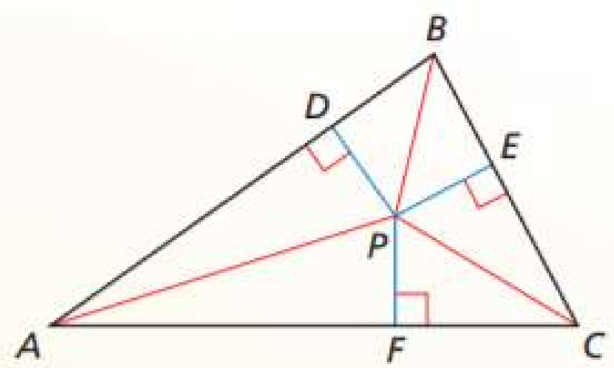
- Use and find the incenter of a triangle.

Theorem 6.6 Incenter Theorem

The incenter of a triangle is equidistant from the sides of the triangle.

If $\overline{AP}$, $\overline{BP}$, and $\overline{CP}$ are angle bisectors of $\triangle ABC$, then $PD = PE = PF$.

Proof Ex. 38, p. 317

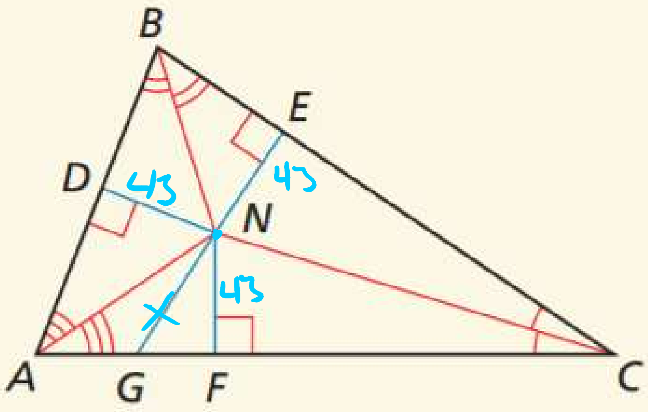


Constructed with angle bisectors (point of concurrence)

Equidistant from each side.

☆ Always in the interior of the triangle.

In the figure shown, $NE = 6x + 1$ and $NF = 4x + 15$.



a. Find ND. 43

b. Can $NB = 40$? Explain your reasoning.

Ne

$6x+1 = 4x+15$

$\frac{2x}{2} = \frac{14}{2}$

$x = 7$

$NE = 6x+1$; $x = 7$

$6 \cdot 7 + 1$

$42 + 1$

43

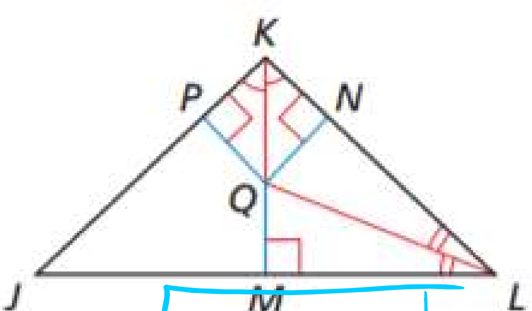
$NF: 4x+15$; $x = 7$

$4 \cdot 7 + 15$

$28 + 15$

43

In the figure shown, $QM = 3x + 8$ and $QN = 7x + 2$. Find QP.



$QP = \frac{25}{2} = 12.5 = 12\frac{1}{2}$

$3x+8 = 7x+2$

$\frac{6}{4} = \frac{4x}{4}$

$\frac{3}{2} = x$

$3x+8$; $x = \frac{3}{2}$

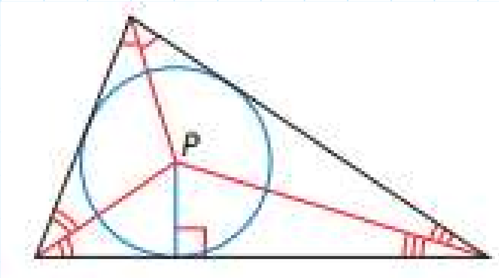
$\frac{3}{1} \cdot \frac{3}{2} + 8$

$\frac{9}{2} + \frac{16}{2} = \frac{25}{2}$

$7x+2$; $x = \frac{3}{2}$

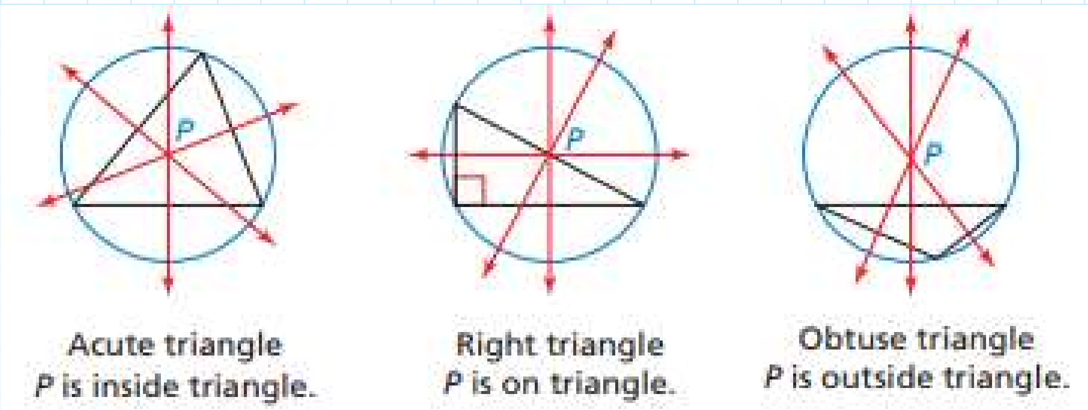
$\frac{7}{1} \cdot \frac{3}{2} + 2$

$\frac{21}{2} + \frac{4}{2} = \frac{25}{2}$



Incenter

Circumcenter



Practice sec 6.2 **pg. 315: 11-16A, 29-32A**

Pg. 328: 1-8A

Practice sec 6.5 **pg. 340: 2, 11-23A**