

5.1 More Practice

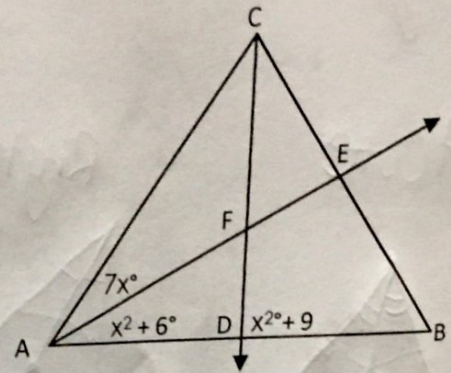
(Please put your work on the same sheet as your homework. **NOT HERE.**)

1. If pt F is the incenter of $\triangle ABC$, find $m\angle BDC$ and the $m\angle BAE$.

2. If pt F is the circumcenter of $\triangle ABC$, find the $m\angle BDC$ and the $m\angle BAE$.

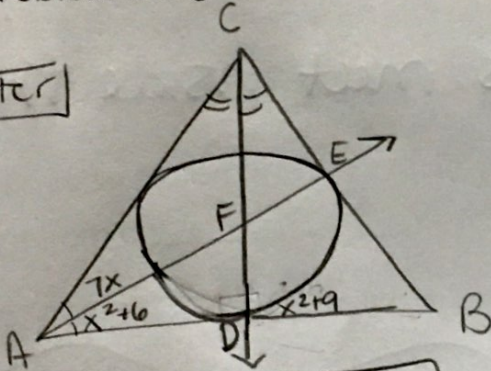
3. Sketch all the angle bisectors and mark the diagram appropriately in an acute, right, and obtuse triangle.

4. Sketch all the perpendicular bisectors and mark the diagram appropriately in an acute, right, and obtuse triangle.



① Incenter

-draw
Circle
Inside



$$m\angle BDC = (x^2 + 9) + 9 = 10^\circ$$

$$\text{or}$$

$$(6)^2 + 9 = 45^\circ$$

$$m\angle BAE = (7x)^2 + 6 = 7^\circ$$

$$\text{or}$$

$$(6)^2 + 6 = 42^\circ$$

Incenter means \Rightarrow angle bisectors

SO....

$$7x = x^2 + 6$$

$$-7x$$

$$-7x$$

$$0 = x^2 - 7x + 6$$

$$0 = (x-1)(x-6)$$

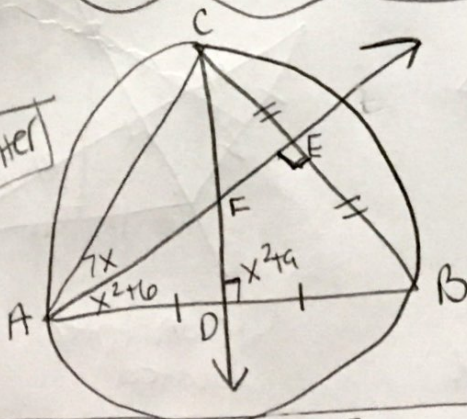
$$x=1 \quad x=6$$

$$\begin{array}{r} 6 \\ -1 \times -6 \\ -7 \end{array}$$

*Picture not drawn to scale

②

Circumcenter



$$m\angle BDC = (x^2 + 9)^2 + 9 = 90^\circ$$

$$m\angle BAE = (x^2 + 9)^2 + 6 = 87^\circ$$

Circumcenter means \Rightarrow perpendicular bisector

SO....

$$x^2 + 9 = 90$$

$$-9 \quad -9$$

$$\sqrt{x^2} = \sqrt{81}$$

$$x = \pm 9$$

*Picture not drawn to scale

③ Angle bisectors \Rightarrow Incenter

Acute



Right



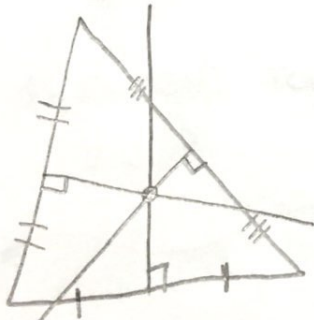
Obtuse



* All Incenters meet inside the Δ .

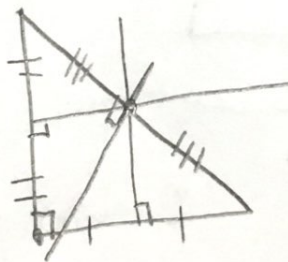
④ Perpendicular bisectors \Rightarrow Circumcenter

Acute



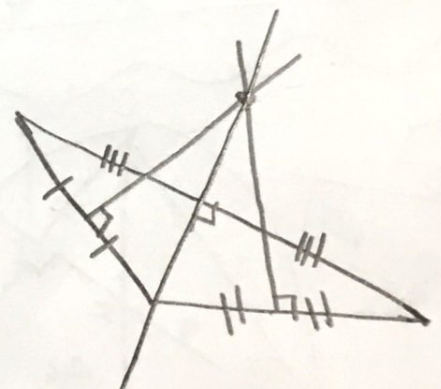
Circumcenter
located
inside

Right



Circumcenter
located
on
hypotenuse

obtuse



Circumcenter
located
outside
of the Δ