

$$U(2, -6)$$

$$V(4, 0)$$

$$\frac{x_1 + x_2}{2}, \quad \frac{y_1 + y_2}{2}$$

$$\left(\frac{2+4}{2}, \frac{-6+0}{2} \right)$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{0 - (-6)}{4 - 2} = \frac{6}{2} = 3 \rightarrow -\frac{1}{3}$$

$$(3, -3)$$

$$y + 3 = -\frac{1}{3}(x - 3)$$

30. Given: $AX = BX$

Prove: X is on the \perp bisector of \overline{AB}

Statement	Reason
-----------	--------

1. $AX = BX$

1. Given

2. $\overline{AX} \cong \overline{BX}$

2. Def of \cong

3. line $l \perp$ to \overline{AB}
through X

3. Given

4. $\angle XYB$ & $\angle XYA$
are rt.

4. Defn of \perp

5. $\angle XYB \cong \angle XYA$

5. rt $\angle \cong$ thm

6. $\overline{XY} \cong \overline{XY}$

6. reflexive prop of \cong

7. $\triangle XYA \cong \triangle XYB$

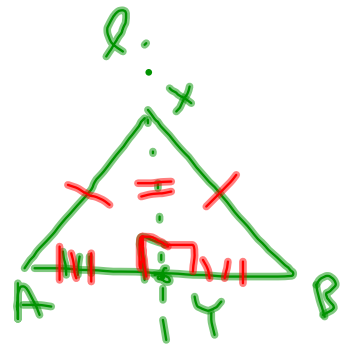
7. HL

8. $\overline{AY} \cong \overline{BY}$

8. CPCTC

9. l is \perp bisector
to \overline{AB}

9. conv. \perp bisector thm



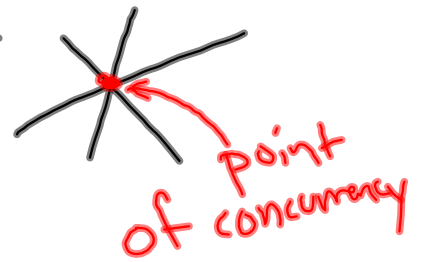
0-4 +

5-7 ✓

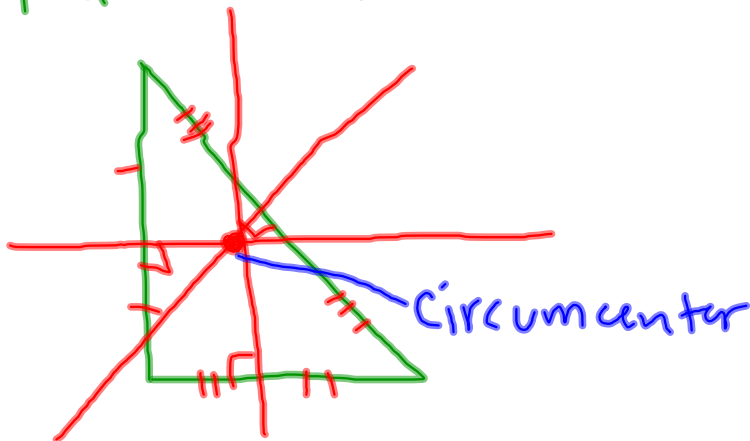
8? -

5.2 bisectors of Δ 's

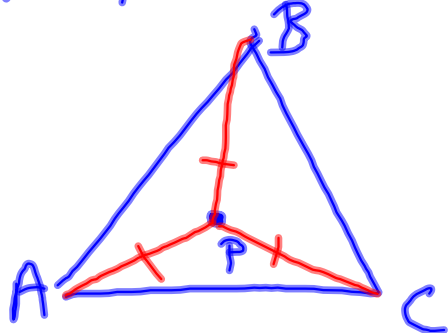
Concurrent: When 3 lines intersect in one point



Circumcenter: pt. of concurrency of the \perp bisectors of a Δ .

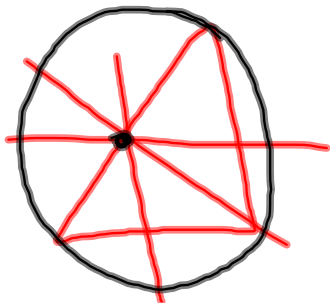


Circumcenter thm: the circumcenter of a Δ is equidistant from the vertices of the Δ .

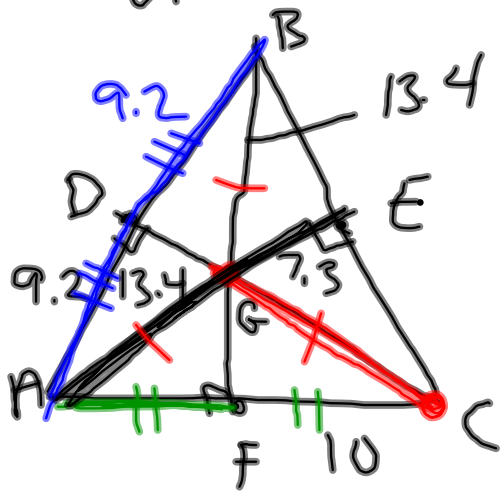


If P is the circumcenter then $PB = PA = PC$

The circumcenter of a Δ is the center of a circumscribed circle. A circle that contains all the vertices of a Δ is circumscribed about the Δ .



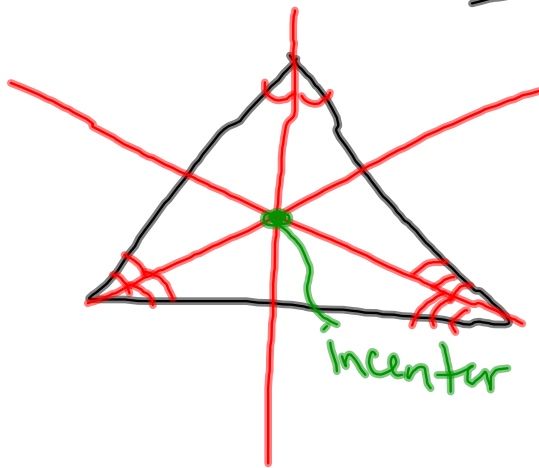
Ex: \overline{DG} , \overline{EG} , + \overline{FG} are \perp bisectors of $\triangle ABC$.



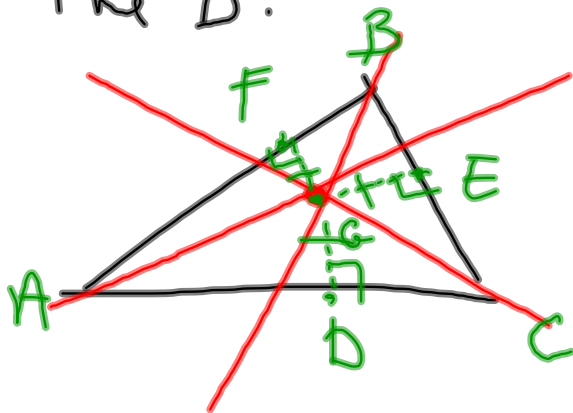
Find:

- A) $GC = 13.4$
- B) $AF = 10$
- C) $AB = 18.4$
- D) $AF = 20.7$

The \angle bisectors of a Δ are concurrent. The pt. of concurrency is called the incenter.

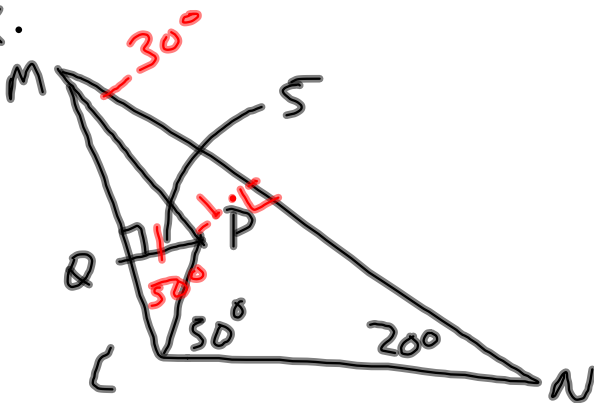


Incenter thm: The incenter of a Δ is equidistant from the sides of the Δ .



$$FG = EG = DG$$

Ex:



A) Find distance from P to \overline{MN}

s by incenter theorem

B) $m\angle PMN = 30^\circ$ since $m\angle PCM = 50$ (\angle bisector),
then $\frac{180 - (50 + 50 + 20)}{2} = 30^\circ$

p. 311

2-36 even skip 18, 8
odds extra credit