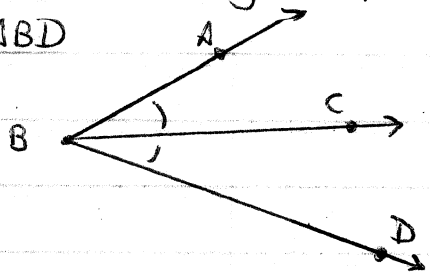
Geometry Ch 5-3 Exer. pg 315 # 1-7, 9-10, 12-14, 19-20, 23-25

1. Copy and complete: Point C is in the interior of $\angle ABD$. If $\angle ABC$ and $\angle DBC$ are congruent, $\overrightarrow{BC}$ is the <u>angle bisector</u> of $\angle ABD$

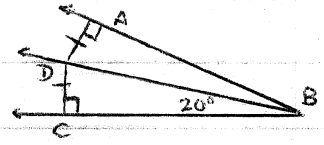


2. How are ⊥ bisectors and angle bisectors of a triangle different? How are they alike?

⊥ bisectors bisect segments, while angle bisectors bisect angles. They are similar in that from their specific points of intersection they divide two parts equally.

Use information in diagram to find the measure.

3. Find $m\angle ABD$



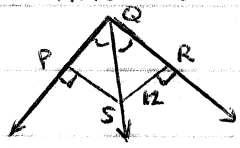
$\overline{AD} \cong \overline{CD}$, given

$\overline{DB} \cong \overline{DB}$, reflexive

$\triangle ADB \cong \triangle CDB$, H-L

$\therefore \angle ABD = 20°$

4. Find PS



$\angle SPQ \cong \angle SRQ$, Given

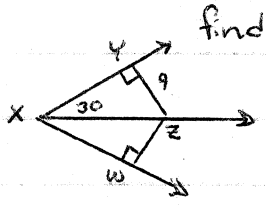
$\angle PQS \cong \angle RQS$, Given

$\overline{QS} \cong \overline{QS}$, Reflexive

$\triangle PQS \cong \triangle RQS$, A-A-S

$\therefore PS = 12$

5. $m\angle YXW = 60°$, find WZ.



$\angle ZXW = 30$, Angle Add'n

$\angle ZXW \cong \angle ZXY$

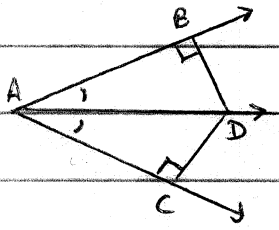
$\angle XYZ \cong \angle XWZ$, Given

$\overline{XZ} \cong \overline{XZ}$, Reflexive

$\triangle XYZ \cong \triangle XWZ$, A-A-S

$\therefore WZ = 9$

Is $\overline{DB} \cong \overline{DC}$? Explain.

6. 

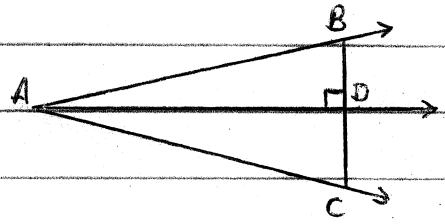
$\angle BAD \cong \angle CAD$, Given

$\angle ABD \cong \angle ACD$, Given

$\overline{AD} \cong \overline{AD}$, Reflexive

$\triangle ABD \cong \triangle ACD$, A-A-S

∴ Yes $\overline{DB} \cong \overline{DC}$

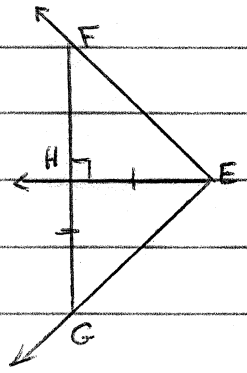
7. 

$\angle BDA \cong \angle CDA$, $\perp$ intersection

$\overline{AD} \cong \overline{AD}$, reflexive.

That's it... one pair of $\cong$ angles and $\cong$ sides. Not enough to prove $\cong$ triangles. Thus, we do not know that $\overline{DB} \cong \overline{DC}$.

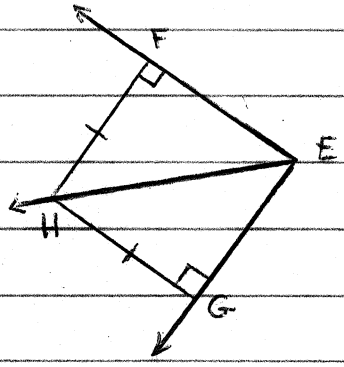
Can you conclude that $\overrightarrow{EH}$ bisects $\angle FEG$? Explain.

9. 

$\angle FHE \cong \angle GHE$, $\perp$ intersect'n

$\overline{HE} \cong \overline{HE}$, Reflexive

There is no other info on congruency. We cannot prove $\triangle$ congruency and do not know relation of $\angle FEH$ to $\angle GEH$ to say whether $\overrightarrow{EH}$ is a bisector.

10. 

$\overline{HF} \cong \overline{HG}$, Given

$\overline{HE} \cong \overline{HE}$, Reflexive

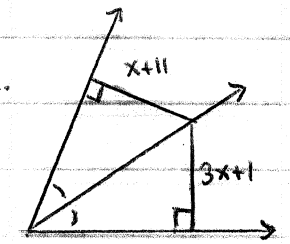
Since $\angle F$ and $\angle G$ are both right,

$\triangle FHE \cong \triangle GHE$, H-L

Thus, $\angle FEH \cong \angle GEH$, C.P.C.T.C.

and this makes $\overrightarrow{EH}$ an angle bisector of $\angle FEG$.

ALGEBRA: Find the value of x.

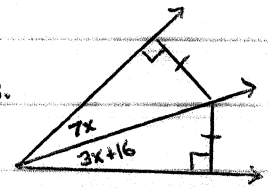
12. 

Δ's $\cong$ by A-A-S

$x + 11 = 3x + 1$

$10 = 2x$

$5 = x$

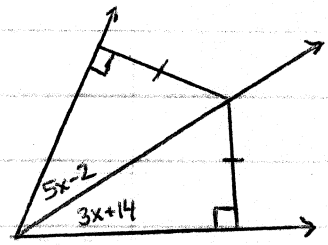
13. 

Δ's $\cong$ by H-L

$7x = 3x + 16$

$4x = 16$

$x = 4$

14. 

Δ's $\cong$ by H-L

$5x - 2 = 3x + 14$

$2x = 16$

$x = 8$

19. Point D is the incenter of ΔXYZ.

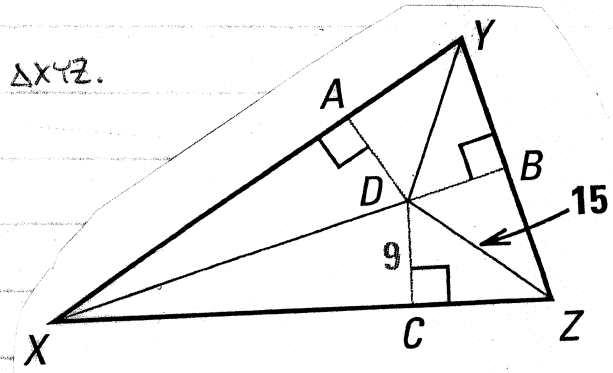
Find DB.

By def'n of Incenter,

$\overline{DA} \cong \overline{DB} \cong \overline{DC}$

Since DC is given as 9,

DB = 9 as well.



20 Point L is incenter of ΔEGJ.

Find HL.

Use Pythagorean Thm to find KL:

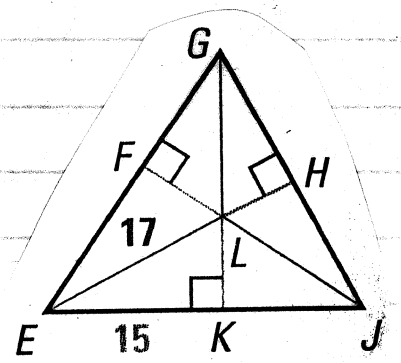
$(KL)^2 + (EK)^2 = (EL)^2$

$(KL)^2 + 15^2 = 17^2$

$(KL)^2 + 225 = 289$

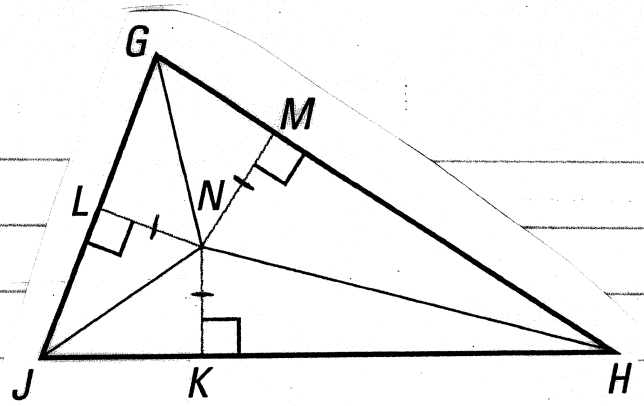
$(KL)^2 = 64$

$KL = 8$



Since KL = 8, HL = 8, [as does FL]

23. In the diagram, N is the incenter of $\triangle GHJ$. Which statement can not be deduced from the given information?



A. $\overline{NM} \cong \overline{NK}$ } True. Incenter is equidistant to each side

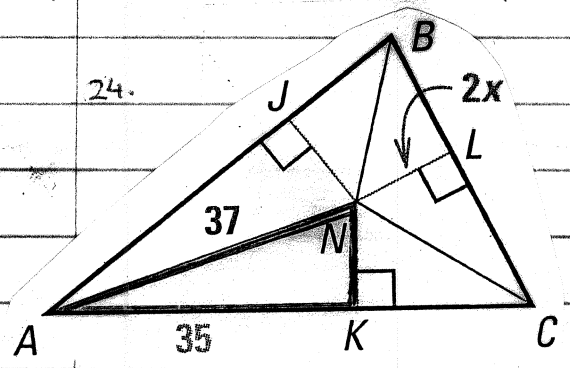
B. $\overline{NL} \cong \overline{NM}$ }

C. $\overline{NG} \cong \overline{NJ}$ NO

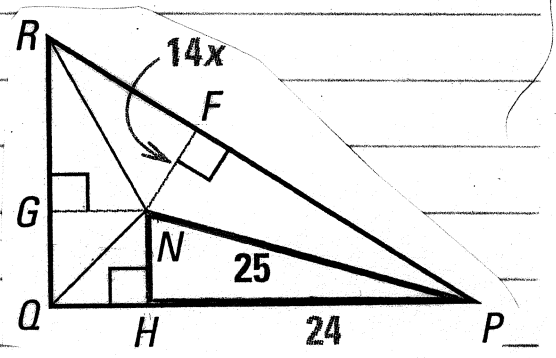
D. $\overline{HK} \cong \overline{HM}$ } True. $\triangle NKH \cong \triangle NMH$, H-L

ALGEBRA: Find the value of x that makes N incenter of the $\triangle$.

24.



25.



Use Pyth Thm to find NK:

$(NK)^2 + (35)^2 = (37)^2$

$(NK)^2 + 1225 = 1369$

$(NK)^2 = 144$

$NK = 12$

$NK = NL$

$12 = 2x$

$6 = x$

$(NH)^2 + (24)^2 = (25)^2$

$(NH)^2 + 576 = 625$

$(NH)^2 = 49$

$NH = 7$

$NH = NF$

$7 = 14x$

$\frac{1}{2} = x$