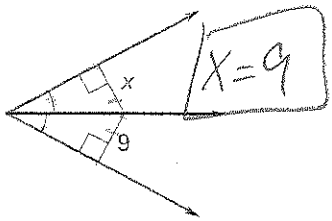
Adv. Geometry Review

Angle Bisectors, Medians and Altitudes

Key

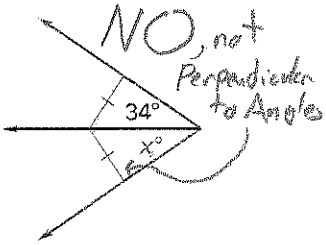
Can you find the value of *x*? *Explain.*

10.



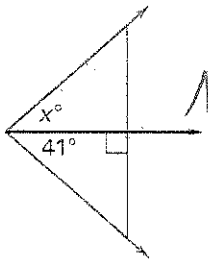
$\boxed{x=9}$

11.



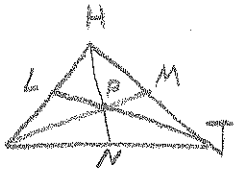
NO, not Perpendicular to Angles

12.



NO, Not ⊥ to angle sides

Copy and complete the statement for △ *HJK* with medians $\overline{HN}$, $\overline{JL}$, and $\overline{KM}$, and centroid *P*.



15. $PN =$ __?__ HN $\boxed{1/3}$

16. $PL =$ __?__ JP $\boxed{1/2}$

17. $KP =$ __?__ KM $\boxed{2/3}$

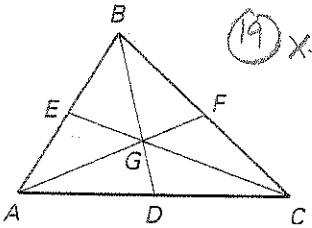
Point *G* is the centroid of △ *ABC*. Use the given information to find the value of *x*.

18. $CG = 3x + 7$ and $CE = 6x$ $\boxed{x=7}$

19. $FG = x + 8$ and $AF = 9x - 6$ $\boxed{x=5}$

20. $BG = 5x - 1$ and $DG = 4x - 5$ $\boxed{x=3}$

$5x-1=2(4x-5)$
$5x-1=8x-10$
$9=3x$



(18) $3x+7=\frac{2}{3}(6x) \rightarrow 3x+7=4x$
$7=x$

(19) $x+8=\frac{1}{3}(9x-6) \rightarrow x+8=3x-2$
$10=2x$
$5=x$

Complete the sentence with *always, sometimes,* or *never*.

21. The median of a triangle is __?__ the perpendicular bisector. Sometimes

22. The altitude of a triangle is __?__ the perpendicular bisector. Sometimes

23. The medians of a triangle __?__ intersect inside the triangle. always

24. The altitudes of a triangle __?__ intersect inside the triangle. Sometimes

Use the graph shown.

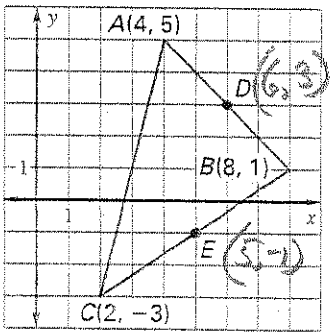
3. Find the coordinates of *D*, the midpoint of $\overline{AB}$. $\boxed{(6,3)}$

4. Find the length of the median $\overline{CD}$. $\boxed{\sqrt{52}}$

5. Find the coordinates of *E*, the midpoint of $\overline{BC}$. $\boxed{(5,-1)}$

6. Find the length of the median $\overline{AE}$.

$AE=\sqrt{(4-5)^2+(5-(-1))^2}$
$=\sqrt{1+36}=\boxed{\sqrt{37}}$



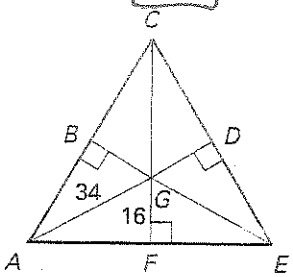
$D\left(\frac{4+8}{2}, \frac{5+1}{2}\right)$

$CD=\sqrt{(6-2)^2+(-3-3)^2}$
$\sqrt{16+36}=\sqrt{52}$

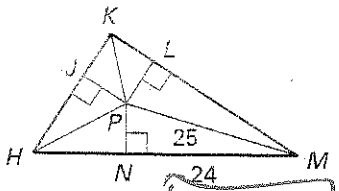
$E\left(\frac{8+2}{2}, \frac{-3+1}{2}\right)$

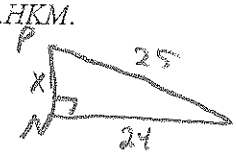
Find the indicated measure.

13. Point G is the incenter of $\triangle ACE$. Find BG. $\boxed{16}$



14. Point P is the incenter of $\triangle HKM$. Find JP. $JP = PN$





$x^2 + 24^2 = 25^2$

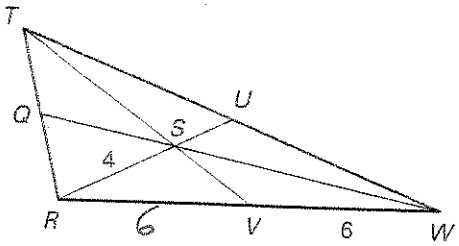
$x^2 = 49$

$x = 7$

$\boxed{JP = 7}$

S is the centroid of $\triangle RTW$, $RS = 4$, $VW = 12$, and $TV = 9$. Find the length of the segment.

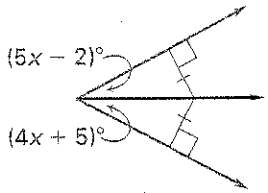
9. $\overline{RV}$ 6
10. $\overline{SU}$ 2
11. $\overline{RU}$ 6
12. $\overline{RW}$ 12
13. $\overline{TS}$ 6
14. $\overline{SV}$ 3



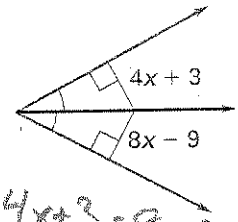
$5x - 2 = 4x + 5 \rightarrow \boxed{x = 7}$

Find the value of x.

7.



8.

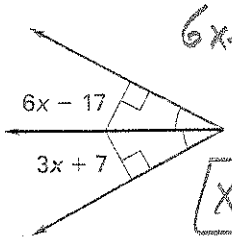


$4x + 3 = 8x - 9$

$12 = 4x$

$\boxed{3 = x}$

9.



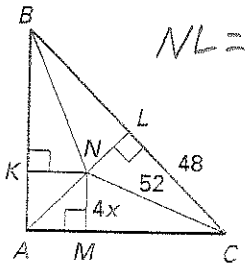
$6x - 17 = 3x + 7$

$3x = 24$

$\boxed{x = 8}$

Find the value of x that makes N the incenter of the triangle.

15.



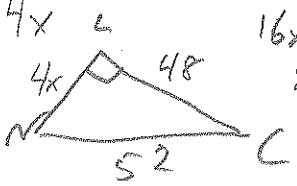
$NL = NM$

$(4x)^2 + 48^2 = 52^2$

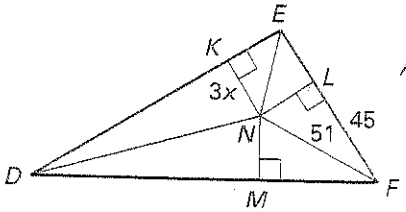
$16x^2 = 400$

$x^2 = 25$

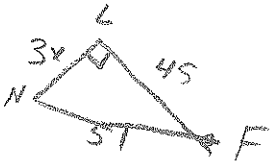
$\boxed{x = 5}$



16.



$KN = NL$



$(3x)^2 + 45^2 = 51^2$

$9x^2 = 576$

$x^2 = 64$

$\boxed{x = 8}$