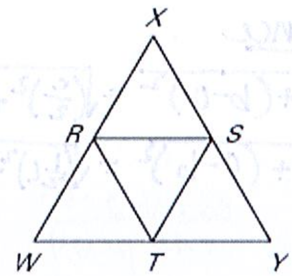
Geometry CP **Quiz Review 5.1-5.4** Name Key

Use ΔWXY, where R, S, and T are midpoints of the sides.



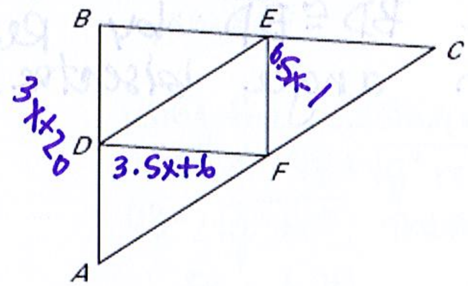
1. $\overline{RS}$ // $\overline{WY}$

2. $\overline{ST}$ // $\overline{WX}$

3. If TY = 4, then RS = 4

4. If RT = 7, then XY = 14

Use the diagram of ΔABC where D, E, and F are the midpoints of the sides. $3x+36$



5. If FE = 6.5x – 1 and AB = 3x + 20, then AB = 26.6

$2(6.5x-1) = 3x+20$

$13x-2 = 3x+20$

$10x = 22$ $x = 2.2$

6. If DF = 3.5 x + 6 and BC = 3x + 36, then DF = 27

$2(3.5x+6) = 3x+36$

$7x+12 = 3x+36$

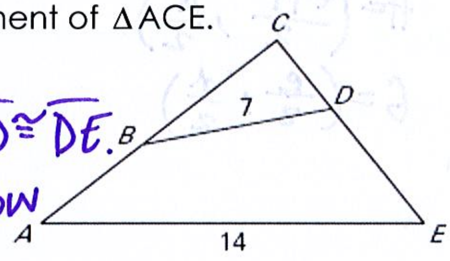
$4x = 24$

$x = 6$

$DF = 3.5(6)+6$

$DF = 27$

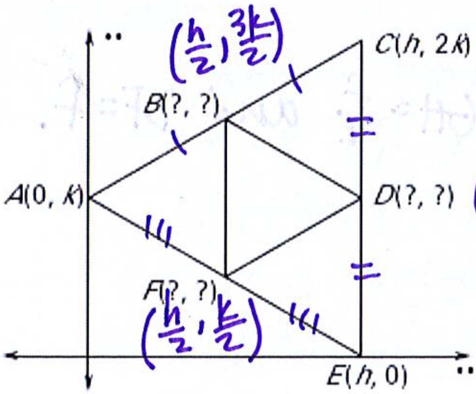
7. Explain why $\overline{BD}$ is not a midsegment of ΔACE.



You don't know $\overline{AB} \cong \overline{BC}$ and $\overline{CD} \cong \overline{DE}$. Also, you don't know $\overline{BD} \parallel \overline{AE}$.

Find the unknown coordinates of the points in the figure.

8.



$(\frac{h}{2}, \frac{3k}{2})$

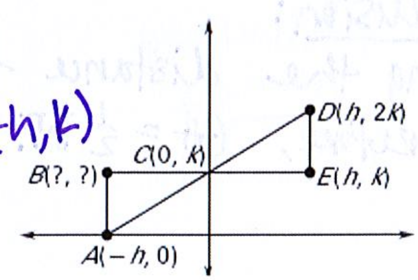
B, D, +F are midpoints!

(h, k)

$(\frac{h}{2}, \frac{k}{2})$

Midpoint formula!

9. $\Delta ABC \cong \Delta DEC$

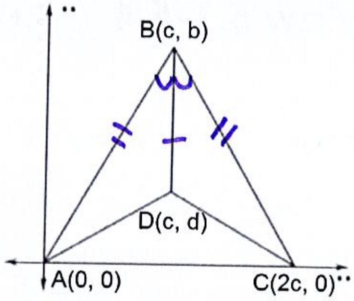


$(-h, k)$

10. Coordinate proof

Given: $\overline{DB}$ bisects $\angle ABC$

Prove: $\Delta ABD \cong \Delta CBD$



WORK: distance

$AB = \sqrt{(c-0)^2+(b-0)^2}$

$AB = \boxed{\sqrt{c^2+b^2}}$

$BC = \sqrt{(2c-c)^2+(0-b)^2} = \sqrt{c^2+(-b)^2} = \boxed{\sqrt{c^2+b^2}}$

conclusion:

Using the distance formula, I found AB and BC both have a length of $\sqrt{c^2+b^2}$, making them congruent. Since $\overline{BD} \cong \overline{BD}$ by the reflexfive property and $\angle ABD \cong \angle CBD$ by definition of angle bisector. Therefore, $\Delta ABD \cong \Delta CBD$ by SAS.

11. Coordinate proof

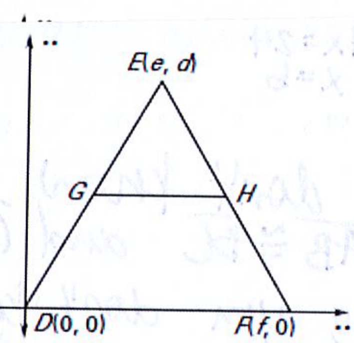
Given: Coordinates of ΔDEF
G is the midpoint of $\overline{DE}$
H is the midpoint of $\overline{EF}$

Prove: $GH = \frac{1}{2}DF$

Midpoint:

$H = \left(\frac{e+f}{2}, \frac{d}{2}\right)$

$G = \left(\frac{e}{2}, \frac{d}{2}\right)$



WORK: distance

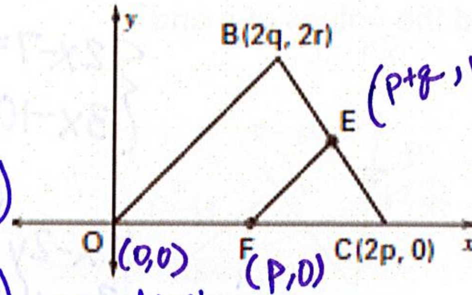
$GH = \sqrt{\left(\frac{e+f}{2}-\frac{e}{2}\right)^2+\left(\frac{d}{2}-\frac{d}{2}\right)^2} = \sqrt{\left(\frac{f}{2}\right)^2+0^2} = \boxed{\frac{f}{2}}$

$DF = \sqrt{(f-0)^2+(0-0)^2} = \sqrt{f^2} = \boxed{f}$

conclusion:

Using the distance formula, I found $GH = \frac{f}{2}$ and $DF = f$. Therefore, $GH = \frac{1}{2}DF$.

12. Coordinate Proof



Given: $\overline{FE}$ is a midsegment

Prove: $\overline{FE} \parallel \overline{OB}$ and FE = $\frac{1}{2}$ OB

(use Midpoint to find coordinates of F and E!)

Midpoint:

$F = \left(\frac{2p+0}{2}, \frac{0+0}{2}\right) = (p, 0)$ $\quad E = \left(\frac{2p+2q}{2}, \frac{2r+0}{2}\right) = (p+q, r)$

Slope:

$m_{FE} = \frac{r-0}{p+q-p} = \boxed{\frac{r}{q}}$ $\quad m_{OB} = \frac{2r-0}{2q-0} = \frac{2r}{2q} = \boxed{\frac{r}{q}}$

Distance:

$FE = \sqrt{(p+q-p)^2 + (r-0)^2}$

$FE = \boxed{\sqrt{q^2+r^2}}$

$OB = \sqrt{(2q-0)^2 + (2r-0)^2}$

$OB = \sqrt{4q^2 + 4r^2}$

$OB = \sqrt{4(q^2+r^2)}$

$OB = \boxed{2\sqrt{q^2+r^2}}$

conclusion:

Using the slope formula, I found $\overline{FE}$ and $\overline{OB}$ both have a slope of $\frac{r}{q}$, making them parallel.

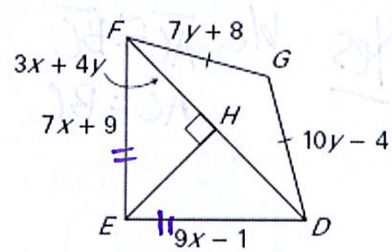
using the distance formula, I found $FE = \sqrt{q^2+r^2}$ and $OB = 2\sqrt{q^2+r^2}$. therefore $FE = \frac{1}{2}OB$.

Use the diagram. $\overline{EH}$ is perpendicular bisector of $\overline{DF}$. Find the indicated measure.

13. Find EF 44   14. Find DE 44

15. Find FG 36   16. Find DG 36

17. Find FH 31   18. Find DF 62



$7x+9 = 9x-1$

$10 = 2x$

$5 = x$

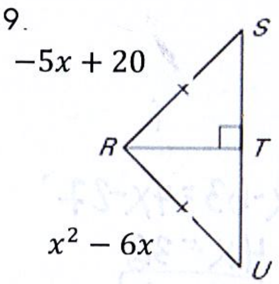
$7y+8 = 10y-4$

$12 = 3y$

$4 = y$

Find the value of x.

19.



$x^2 - 6x = -5x + 20$

$x^2 - x - 20 = 0$

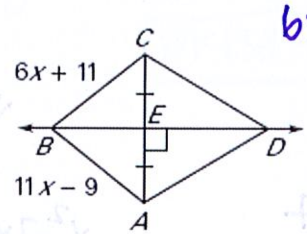
$(x-5)(x+4) = 0$

$x-5=0 \quad x+4=0$

$\cancel{x=5} \quad \boxed{x=-4}$

the negative works!!

20.



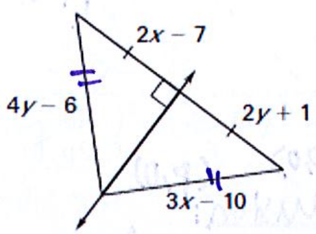
$6x+11 = 11x-9$

$20 = 5x$

$\boxed{4 = x}$

Find the values of x and y.

21.



$$\begin{cases} 2x-7=2y+1 \\ 3x-10=4y-6 \end{cases}$$

↓

$(2x-2y=8)^{*-2}$

$3x-4y=4$

↓

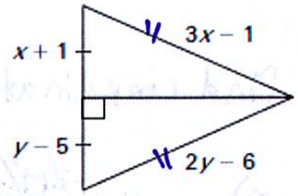
$-4x+4y=-16$

$+\;3x-4y=4$

$-x = -12$

$\boxed{y=8}$ $\boxed{x=12}$

22.



$$\begin{cases} 3x-1=2y-6 \\ x+1=y-5 \end{cases}$$

↓

$3x-2y=-5$

$(x-y=-6)^{*-2}$

↓

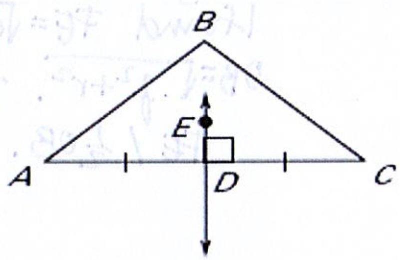
$3x-2y=-5$

$-2x+2y=12$

$x = 7$

$\boxed{x=7 \quad y=13}$

23. Explain why the conclusion is not correct given the information in the diagram.

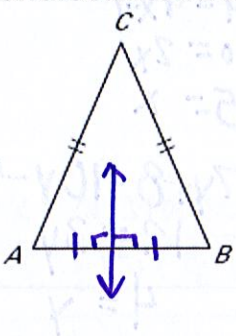


$\overleftrightarrow{DE}$ will pass through B.

We do not know AB = BC. B must be equidistant from both endpoints.

Tell whether the information in the diagram allows you to conclude that C is on the perpendicular bisector of $\overline{AB}$

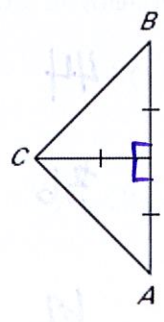
24.



Yes b/c $\overline{AC} \cong \overline{BC}$

$AC = BC$

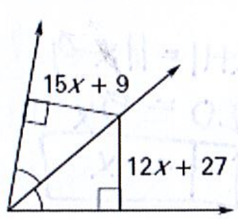
25.



No. we do not know BC = AC.

Find the value of x.

26.

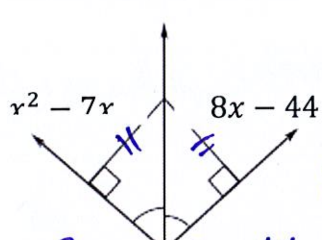


$15x+9=12x+27$

$3x=18$

$\boxed{x=6}$

27.



$x^2-7x=8x-44$

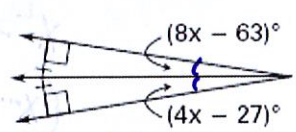
$x^2-15x+44=0$

$(x-11)(x-4)=0$

$x-11=0$ $x-4=0$

doesn't work when plug back in

28.



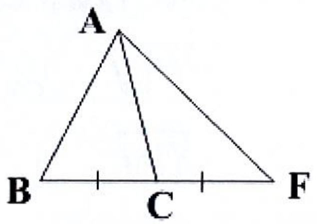
$8x-63=4x-27$

$4x=36$

$\boxed{x=9}$

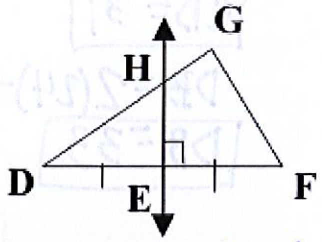
In #29-32, use one of our key terms from this chapter to name the identified segment.

29. $\overline{AC}$



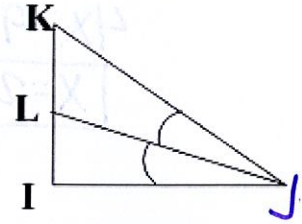
Median

30. $\overline{HE}$



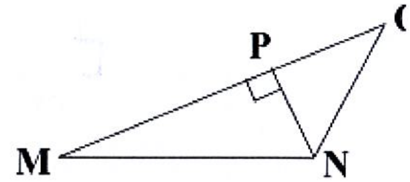
perpendicular bisector

31. $\overline{JL}$



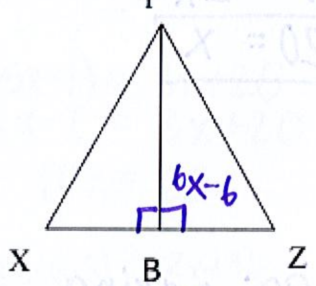
angle bisector

32. $\overline{PN}$



Altitude

33. $\overline{YB}$ is an altitude of $\triangle XYZ$ and m $\angle YBZ = (6x - 6)°$. Find the value of x. What is the measure of $\angle YBZ$?



$6x-6=90$

$6x=96$

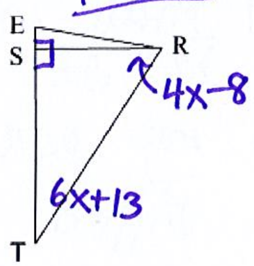
$\boxed{x=16}$

$m\angle YBZ = 6(16)-6$

$\boxed{m\angle YBZ = 90}$

duh, its an altitude!

34. $\overline{RS}$ is an altitude of $\triangle RTE$, m $\angle SRT = (4x - 8)°$ and m $\angle STR = (6x + 13)°$. Find the value of x.



$4x-8+6x+13+90=180$

or

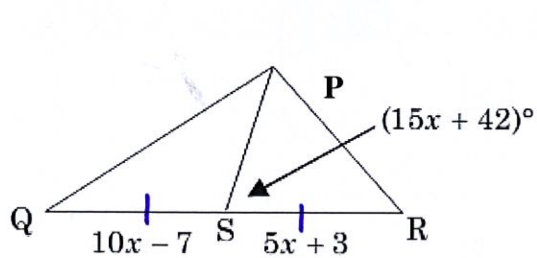
$4x-8+6x+13=90$

$10x+5=90$

$10x=85$

$\boxed{x=8.5}$

35. Find x and the measure of $\angle PSR$ if $\overline{PS}$ is a median.



$10x-7=5x+3$

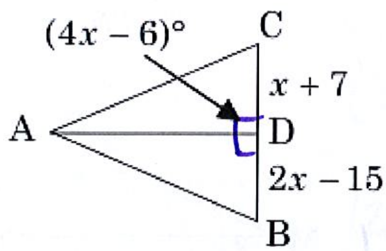
$5x=10$

$\boxed{x=2}$

$m\angle PSR = 15(2)+42$

$\boxed{m\angle PSR = 72}$

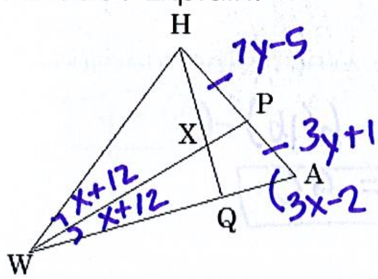
36. Find x, CD, and DB if $\overline{AD}$ is an alititude of $\triangle$ABC.



$4x-6=90$
$4x=96$
$\boxed{x=24}$

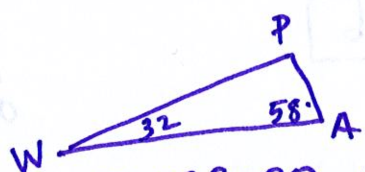
$CD=24+7$
$\boxed{CD=31}$
$DB=2(24)-15$
$\boxed{DB=33}$

37. $\triangle$WHA, if $\overline{WP}$ is a median and an angle bisector, AP = 3y + 11, PH = 7y – 5, m ∠HWP = x + 12, m ∠PAW = 3x – 2, and m ∠HWA = 4x – 16, find x and y. Is $\overline{WP}$ also an altitude? Explain.



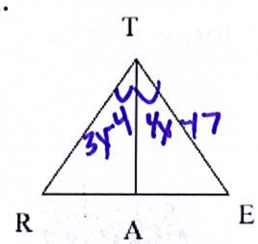
$7y-5=3y+11$
$4y=16$
$\boxed{y=4}$

$x+12+x+12=4x-16$
$2x+24=4x-16$
$40=2x$
$\boxed{20=x}$



$32+58=90$ so ∠P must = 90°, making WP an altitude.

38. In $\triangle$RTE, $\overline{TA}$ bisects ∠RTE, m ∠RTA = (3y – 4)° and m ∠ETA = (4y – 17)°. Find the measure of ∠RTE.



$3y-4=4y-17$
$13=y$

$m\angle RTE=3(13)-4+4(13)-17$
$m\angle RTE=35+35$
$\boxed{m\angle RTE=70°}$