HW 1D: (HL) 1f, 2eh, 3eh, 4b, 8*

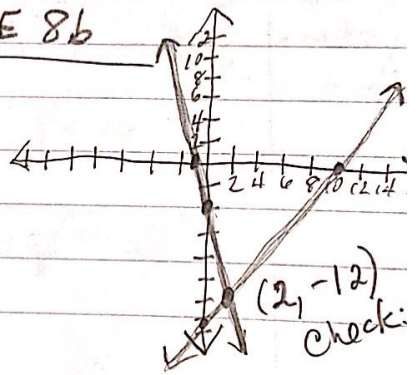
(SL) 2c, D.2 2e, 3b, D.3 2f, 3e, 1E 8b

1f.) $3x - 2y = 30$ $(0,-15)$, $(10,0)$, $m = \frac{3}{2}$

$4x + y = -4$ $(0,-4)$, $(-1,0)$, $m = -4$

$3(2) - 2(-12) = 30 \Rightarrow 6 + 24 = 30 \Rightarrow 30 = 30$ ✓

$4(2) - 12 = -4 \Rightarrow 8 - 12 = -4 \Rightarrow -4 = -4$ ✓



2e.) $3x+4y=-13$ $3(8y-2)+4y=-13$ $x=8\left(\frac{-1}{4}\right)-2$

$x=8y-2$ $24y-6+4y=-13$

$28y=-7$ $x=-2-2$

$\boxed{(-4,\frac{-1}{4})}$ $\boxed{y=\frac{-7}{28}=\frac{-1}{4}}$ $\boxed{x=-4}$

2h.) $x=\frac{-3}{4}y$ $4\left(\frac{-3}{4}y\right)-5y=-24$ $x=\frac{-3}{4}(3)$

$4x-5y=-24$ $-3y-5y=-24$ $\boxed{x=\frac{-9}{4}}$

$\boxed{\left(\frac{-9}{4},3\right)}$ $-8y=-24$

$\boxed{y=3}$

3e.) $3x-7y=-8$ (-3) $3x-7\left(\frac{5}{4}\right)=-8$ $\boxed{\left(\frac{1}{4},\frac{5}{4}\right)}$

$9x+12y=16$

$+\ -9x+21y=24$ $3x-\frac{35}{4}=-8$

$32y=40$ $3x=-8+\frac{35}{4}\Rightarrow\left(\frac{-32}{4}+\frac{35}{4}\right)$

$\boxed{y=\frac{40}{32}=\frac{5}{4}}$ $3x=\frac{3}{4}$ $\therefore\ \boxed{x=\frac{1}{4}}$

3h.) $4x+2y=-23$ (5) $\Rightarrow$ $20x+10y=-115$

$5x-7y=-5$ (-4) $-20x+28y=20$

$38y=-95$

$4x+2\left(\frac{-5}{2}\right)=-23$ $\boxed{\left(\frac{-9}{2},\frac{-5}{2}\right)}$ $\boxed{y=\frac{-95}{38}\div\frac{19}{19}=\frac{-5}{2}}$

$4x-5=-23$

$4x=-18$

$\boxed{x=\frac{-18}{4}=\frac{-9}{2}}$

46.) Find the area of the triangle defined by:
$5x-2y=18$, $2x+5y=13$, $8x-9y=11.4$

$5x-2y=18$ (2)
$2x+5y=13$ (-5)

$10x-4y=36$
$+\ -10x-25y=-65$

$-29y=-29$
$\therefore y=1$

$2x+5(1)=13$
$2x=8$
$\therefore x=4$
$(4,1)$

$2x+5y=13$ (-4)
$8x-9y=11.4$

$+\ -8x-20y=-52$

$\frac{-29y}{-29}=\frac{-40.6}{-29}$

$\therefore y=1.4$

$2x+5(1.4)=13$
$2x+7=13$
$2x=6$
$\therefore x=3$
$(3,1.4)$

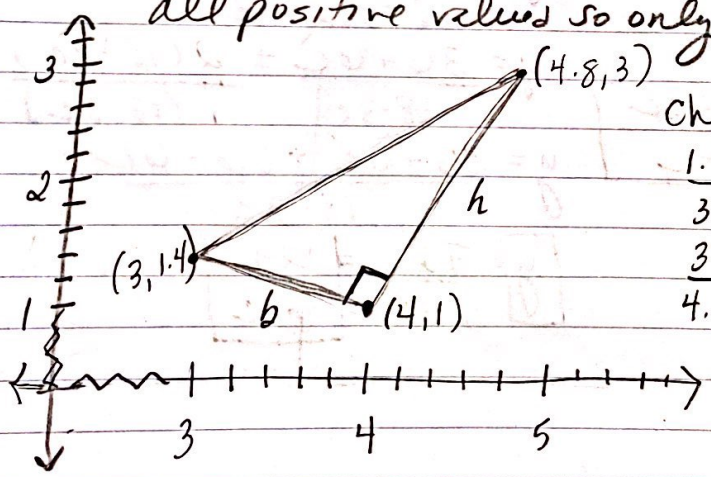
$5x-2y=18$ (9)
$8x-9y=11.4$ (-2)

$45x-18y=162$
$+\ -16x+18y=-22.8$

$\frac{29x}{29}=\frac{139.2}{29}$

$\therefore x=4.8$
$5(4.8)-2y=18$
$24-2y=18$
$-2y=-6$
$\therefore y=3$
$(4.8,3)$

all positive values so only graphing the 1st quadrant



Check slopes to verify perpendicular

$\frac{1.4-1}{3-4}=\frac{0.4}{-1}=-0.4=-\frac{2}{5}$ ✓

$\frac{3-1}{4.8-4}=\frac{2}{0.8}=2.5=\frac{5}{2}$ ✓

$A=\frac{1}{2}(\sqrt{1.16})(\sqrt{4.64})$
$=1.16=1\frac{4}{25}$ sq. units

use distance formula to get base & height

$b=\sqrt{(3-4)^2+(1.4-1)^2}=\sqrt{(-1)^2+(0.4)^2}=\sqrt{1+.16}=\sqrt{1.16}$

$h=\sqrt{(4.8-4)^2+(3-1)^2}=\sqrt{(0.8)^2+(2)^2}=\sqrt{0.64+4}=\sqrt{4.64}$

8*) HL only $12 = 4x - cy \Rightarrow m = 4/c$

$2x + 6 = 3y \Rightarrow y = \frac{2}{3}x + 2$

a.) $\frac{2}{3} \neq \frac{4}{c}$

b.) $\frac{2}{3} = \frac{4}{c} \Rightarrow 2c = 12$

$\therefore \boxed{c = 6}$

If $c = 6$, the 1st eq. is $12 = 4x - 6y$

$\Rightarrow -6y = -4x + 12 \Rightarrow y = \frac{2}{3}x - 2$ and

the equations are parallel ∴ no solution

c.) $12 = 4x - c\left(\frac{2}{3}x + 2\right)$

$4x - \frac{2}{3}xc - 2c = 12$ (multiply by 3 to get rid of fraction)

$12x - 2xc - 6c = 36$

$+6c \quad +6c$

$12x - 2xc = 36 + 6c$

$\frac{x(12 - 2c)}{12 - 2c} = \frac{36 + 6c}{12 - 2c}$

$\boxed{x = \frac{36 + 6c}{12 - 2c} = \frac{18 + 3c}{6 - c}}$

$y = \frac{2}{3}\left(\frac{18 + 3c}{6 - c}\right) + 2$

$y = \frac{36 + 6c}{18 - 3c} + 2$

$y = \frac{36 + 6c}{18 - 3c} + \frac{2(18 - 3c)}{1(18 - 3c)}$

$y = \frac{36 + 6c + 36 - 6c}{18 - 3c}$

$\boxed{y = \frac{72}{18 - 3c} = \frac{24}{6 - c}}$