4) a) $K(15,3)$ $m=-\frac{4}{3}$ (x_1, y_1)

Method 2:

$y=m(x-x_1)+y_1$

$y=-\frac{4}{3}(x-15)+3$

$y=\frac{-4}{3}x+\frac{4}{3}\cdot\frac{15}{1}+3$

$y=\frac{-4}{3}x+\frac{4\cdot15}{3}+3$

$y=\frac{-4}{3}x+20+3$

$y=\frac{-4}{3}x+23$

b) $P(-6,2)$ $m=-\frac{1}{3}$

$y=mx+b$

$2=\frac{-1}{3}(-6)+b$

$2=\frac{6}{3}+b$

$2-2=2+b-2$

$\boxed{0=b}$

$\therefore y=\frac{-1}{3}x$

c) $T(3,2)$ $y=2x-7$

Since the 2nd line is parallel, it has the same slope. $\boxed{m=2}$ $T(3,2)$

$y=mx+b$

$2=2(3)+b$

$2-6=6+b-6$

$\boxed{-4=b}$

$\therefore \boxed{y=2x-4}$

---

d) $S(-1,-5)$ $\perp$ to $y=-2x+3$

Since the 2nd line is $\perp$ (perpendicular) its slope is $\frac{1}{2}$

$m=\frac{1}{2}$ $S(-1,-5)$ (x_1, y_1)

$y=m(x-x_1)+y_1$

$y=\frac{1}{2}(x-(-1))-5$

$y=\frac{1}{2}(x+1)-5$

$y=\frac{1}{2}x+\frac{1}{2}-5$ (0.5)

$\boxed{y=0.5x-4.5}$

or

$\boxed{y=\frac{1}{2}x-\frac{9}{2}}$

e) $P(1,1)$ $y=\frac{-4}{3}x+9$

$m_1=\frac{-4}{3}$, other slope is $m_2=\frac{3}{4}$

$y=mx+b$

$1=\frac{3}{4}(1)+b$

$1-\frac{3}{4}=\frac{3}{4}+b-\frac{3}{4}$

$\boxed{\frac{1}{4}=b}$

$\therefore y=\frac{3}{4}x+\frac{1}{4}$

f) $m=\frac{5}{3}$ $(2,-1)$

$y=m(x-x_1)+y_1$

$y=\frac{5}{3}(x-2)-1$

$y=\frac{5}{3}x-\frac{10}{3}-\frac{1\cdot3}{1\cdot3}$

$y=\frac{5}{3}x-\frac{13}{3}$

---

g) x-int $(4,0)$

$m=-1$

$y=m(x-x_1)+y_1$

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

$\boxed{y=-x+4}$

5) a) $(2,-4)$ $(7,-19)$

Step 1 x_1 y_1 x_2 y_2

$$m = \frac{-19-(-4)}{7-2} = \frac{-19+4}{5} = \frac{-15}{5} = -3$$

$\boxed{m=-3}$

Step 2: Using either point find the equation

$m=-3$ $(2,-4)$

$y = m(x-x_1)+y_1$

$y = -3(x-2)-4$

$y = -3x+6-4$

$\boxed{y=-3x+2}$

b) $(-3,4)$ $(-7,-10)$ (x_1 y_1 x_2 y_2)

$$m = \frac{-10-4}{-7-(-3)} = \frac{-14}{-7+3} = \frac{-14}{-4} = \frac{7}{2}$$

$m=\frac{7}{2}$ $(-3,4)$

$y = mx+b$

$4 = \frac{7}{2}(-3)+b$

$4 + \frac{21}{2} = -\frac{21}{2} + b + \frac{21}{2}$

$\frac{4}{1}\cdot\frac{2}{2} + \frac{21}{2} = b$

$\frac{8}{2} + \frac{21}{2} = b$

$\boxed{b = \frac{29}{2}}$

$\therefore y = \frac{7}{2}x + \frac{29}{2}$

c) $(-2,0)$ $(2,7)$

$$m = \frac{7-0}{2-(-2)} = \frac{7}{4}$$

$m = 7/4$

$y = mx+b$ $(-2,0)$

$0 = \frac{7}{4}(-2)+b$

$0 = \frac{-7}{2}+b$

$\boxed{b = 7/2}$

$\therefore y = \frac{7}{4}x + \frac{7}{2}$

---

f) $y = 3x(-4)$ → $(0,-4)$ and $(9,0)$

$$m = \frac{0-(-4)}{9-0} = \frac{4}{9} \quad m=\frac{4}{9}$$

$y = mx+b$ $(0,-4)$

$-4 = \frac{4}{9}(0)+b$

$\boxed{-4=b}$

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

6) a) $(-2,-5)$

Convert to $y=mx+b$ b/c you need to determine the slope.

$2x+y-5-2x+5=0-2x+5$

$y=-2x+5$

Slope will be the same SINCE the lines are parallel.

$m=-2 \quad (-2,-5)$

$y=m(x-x_1)+y_1$

$y=-2(x-(-2))-5$

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

$y=-2x-4-5$

$\boxed{y=-2x-9}$

b) $3x-y+1=0$ $+y$ $+y$

$3x+1=y$

$y=3x+1$

$m_1=3 \quad \boxed{m_2=-1/3}$

$(7,-1)$

$y=mx+b$

$-1=\frac{-1}{3}(7)+b$

$-1+\frac{7}{3}=\frac{-7}{3}+b+\frac{7}{3}$

$\boxed{\frac{4}{3}=b}$

$\therefore \boxed{y=\frac{-1}{3}x+\frac{4}{3}}$

c) $5x+3y-2-5x+2=0-5x+2$

$\frac{3y}{3}=\frac{-5x}{3}+\frac{2}{3}$

$y=\frac{-5}{3}x+\frac{2}{3}$

$m_1=\frac{-5}{3} \quad || \quad m_2=-\frac{5}{3}$

$y=m(x-x_1)+y_1$

$y=\frac{-5}{3}(x-(-3))+4$

$y=\frac{-5}{3}(x+3)+4$

$y=\frac{-5}{3}x-5+4$

$\boxed{y=\frac{-5}{3}x-1}$

---

7) a) We'll use the equation below to determine the x-int.

$3x-7y+12=0$

To find the x-int sub "0" for "y"

$3x-7(0)+12=0$

$3x+12-12=0-12$

$\frac{3x}{3}=\frac{-12}{3}$

$\boxed{x=-4} \quad \boxed{(-4,0)}$

Step 2: Finding the slope

$6x+8y-5-6x+5=0-6x+5$

$\frac{8y}{8}=\frac{-6x}{8}+\frac{5}{8}$

$y=\frac{-3}{4}x+\frac{5}{8}$

$m_1=\frac{-3}{4} \quad || \quad m_2=\frac{-3}{4}$

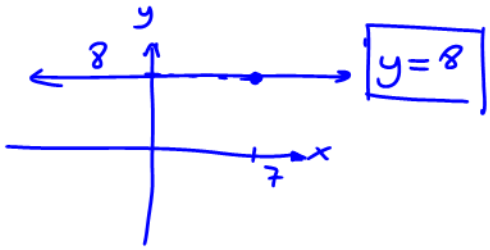
Step 3 $m_2=-3/4 \quad (-4,0)$

$y=m(x-x_1)+y_1$

$y=\frac{-3}{4}(x+4)+0$

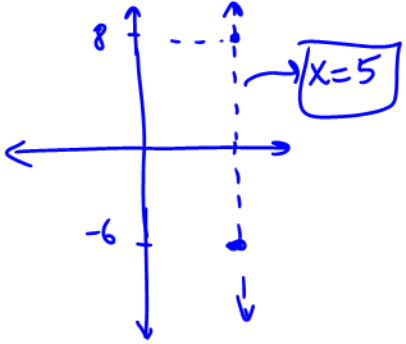
$\boxed{y=\frac{-3}{4}x-3}$

8) a)



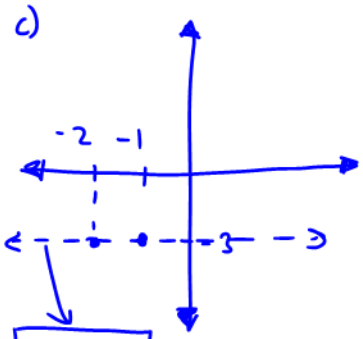
$y = 8$

b)



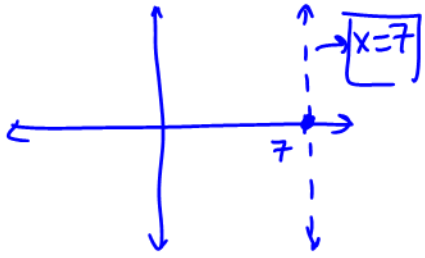
$x = 5$

c)



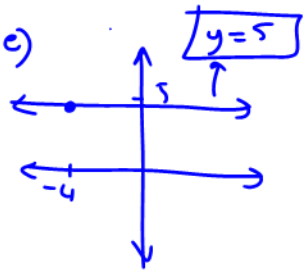
$y = -3$

d)



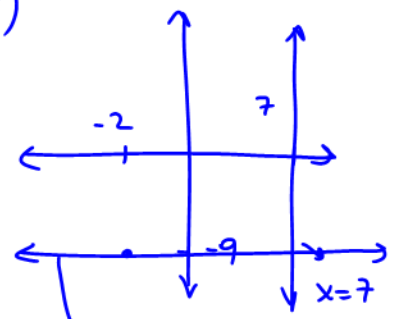
$x = 7$

e)



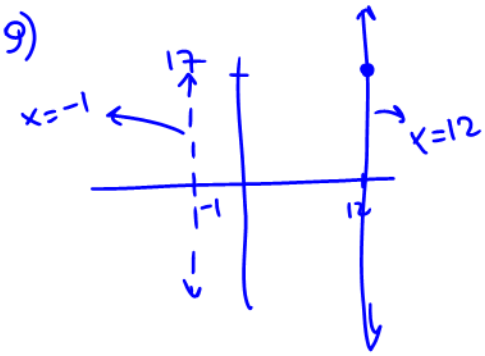
$y = 5$

f)

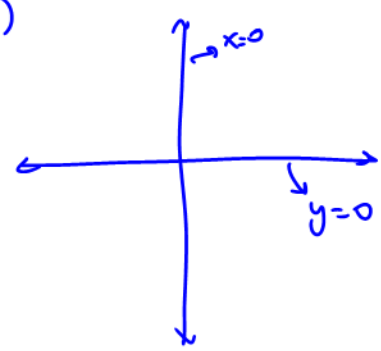


$y = -9$

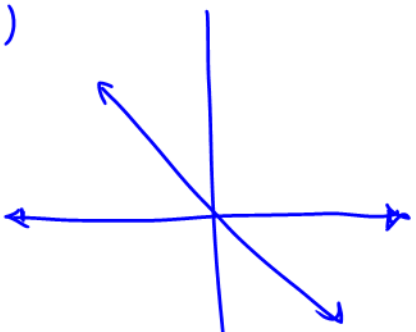
g)



h)



i)



$m = -1/2$

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