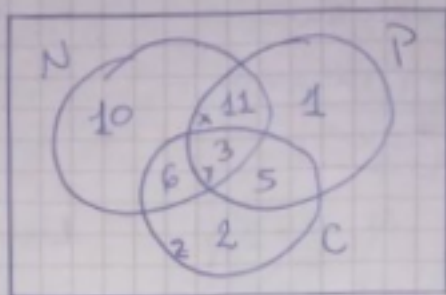**2)** $\#U = 50$

$\#N = 30$

$\#P = 20$

$\#C = 16$

$\#(N \cap \bar{P} \cap \bar{C}) = 10$

$\#(\bar{N} \cap P \cap C) = 5$

$\#(\overline{N \cup P \cup C}) = 12$

$\#(\bar{A} \cap B \cap \bar{C}) = 1$

$U = 50$

a) $\#(N \cap P \cap C) = 3$
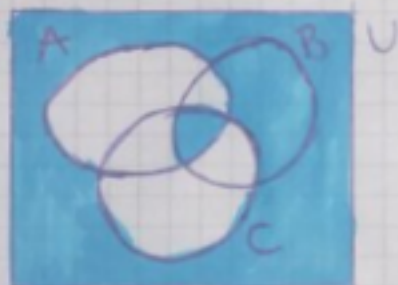
b) $\#(N \cap P \cap \bar{C}) = 11$

$X + Y = 14$

$50 = 10 + 12 + 6 + 5 + 1 + 14 + Z$

$50 - 48 = Z$

$\boxed{2 = Z}$

5) $(\bar{A} \cap \bar{B} \cap \bar{C}) \cup (B \cap \bar{C} \cap \bar{A}) \cup (A \cap B \cap C)$

1) $\begin{cases} \frac{1}{2}x - \frac{1}{6}y = 1 & ① \\ 3x - y = 6 & ② \end{cases}$

② $3x - y = 6$

$-y = 6 - 3x$

$y = -6 + 3x \Rightarrow \frac{1}{2}x - \frac{1}{6}(-6 + 3x) = 1$

$\frac{1}{2} - \frac{1}{\cancel{6}_2}\cancel{x}(-2 + x) = 1$

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

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

$\frac{1}{2}x - \frac{1}{2}x = 0$

$0 = 0$

$\boxed{SCI}$

4) $r_1: (2x-3y)t - kx + t = k-5$ $r_2: (x+y)k + ty - 2k+1 = t$

$r_1: 2xt - 3yt - kx + t = k-5$ $r_2: kx + ky + ty - 2k+1 = t$

$2 \cdot 0 \cdot t - 3 \cdot 0 \cdot t - k \cdot 0 + t = k-5$ $k \cdot 0 + k \cdot 0 + t \cdot 0 - 2k+1 = t$

$$\boxed{t = k-5}$$ $$\boxed{t = -2k+1}$$

$\begin{cases} t = k-5 &\text{①} \\ t = -2k+1 &\text{②} \end{cases}$ $t = 2-5$ Las rectas se cortan

                 $\boxed{t = -3}$ en $(0,0)$

Reemplazo ① en ②

$k-5 = -2k+1$

$k + 2k = 1+5$ Sol $= \{ T, K \in \mathbb{R} / t = -3 \wedge k = 2 \}$

$3k = 6$

$\boxed{k = 2}$

3) $A = \begin{vmatrix} -2 & 3 \\ 0 & 1 \end{vmatrix}$ $B = \begin{vmatrix} 4 & 2 \\ 1 & -1 \end{vmatrix}$

$\underline{A^t - \frac{1}{2} B^2}$

$B^2 = B \cdot B = \begin{vmatrix} 4 & 2 \\ 1 & -1 \end{vmatrix} \cdot \begin{vmatrix} 4 & 2 \\ 1 & -1 \end{vmatrix} = \begin{vmatrix} c_{11} & c_{12} \\ c_{21} & c_{22} \end{vmatrix} = \begin{vmatrix} 18 & 6 \\ 3 & 3 \end{vmatrix} \cdot \frac{1}{2} = \begin{vmatrix} 9 & 3 \\ 3/2 & 3/2 \end{vmatrix}$

$c_{11} = 16+2 = 18$

$c_{12} = 8-2 = 6$ $A^t - \frac{1}{2} B^2 = \begin{vmatrix} -2 & 0 \\ 3 & 1 \end{vmatrix} - \begin{vmatrix} 9 & 3 \\ 3/2 & 3/2 \end{vmatrix} = \begin{vmatrix} -2+(-9) & 0+(-3) \\ 3+(-3/2) & 1+(-3/2) \end{vmatrix} = \begin{vmatrix} -11 & -3 \\ 3/2 & -1/2 \end{vmatrix}$

$c_{21} = 4-1 = 3$

$c_{22} = 2+1 = 3$

6) $A(1,-4,x) + B(1,4,4) + C(0,-4,1) = (0,0,0)$

① $\begin{cases} 1a + 1b = 0 \implies \boxed{b = -a} \\ -4a + 4b - 4c = 0 \\ xa + 4b + 1c = 0 \end{cases}$
②
③

② $-4a + 4(-a) - 4c = 0$

$-4a - 4a - 4c = 0$

$-8a - 4c = 0$

$-4c = 8a$

$c = \dfrac{8}{-4} a$

$\boxed{c = -2a}$

③ ~~~~~~~

$xa + 4(-a) + 1(-2a) = 0$

$xa - 4a - 2a = 0$

$xa - 6a = 0$

$x \cdot a = 6a$

$\boxed{x = 6}$

Reemplazo

Linealmente

Dependiente