(21)

a) $r) \begin{cases} x + 2y - z = 3 & (\pi_1) \\ 2x - y + 2z = -1 & (\pi_2) \end{cases}$ $\qquad \bar{n}_1 = (1, 2, -1) \perp \pi_1$

$\qquad \bar{n}_2 = (2, -1, 2) \perp \pi_2$

Sea $\bar{u}$ vector dirección de r

$$\left.\begin{array}{l} r \subseteq \pi_1 \rightarrow \bar{n}_1 \perp r \\ r \subseteq \pi_2 \Rightarrow \bar{n}_2 \perp r \end{array}\right\} \Rightarrow \begin{array}{l} \bar{n}_1 \wedge \bar{n}_2 \parallel r \\ \bar{u} := \bar{n}_1 \wedge \bar{n}_2 \end{array}$$

$$\bar{u} := \bar{n}_1 \wedge \bar{n}_2 = \begin{vmatrix} 1 & 2 & -1 \\ 2 & -1 & 2 \end{vmatrix} = (1, -4, -5)$$

Busco punto de paso $P_0(x_0, y_0, z_0) \in r$

Sea $z_0 = 0$ $\begin{cases} x_0 + 2y_0 = 3 \Rightarrow x_0 = 3 - 2y_0 \\ 2x_0 - y_0 = -1 \Rightarrow 2(3 - 2y_0) - y_0 = -1 \end{cases}$

$6 - 4y_0 - y_0 = -1$

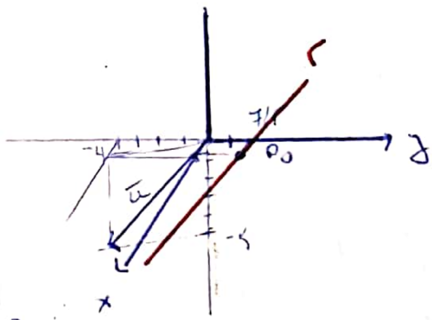
$7 = 5y_0$

$7/5 = y_0$

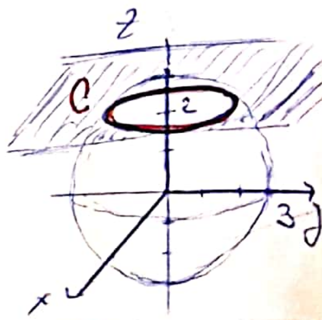
$x_0 = 3 - 2 \cdot \frac{7}{5} = \frac{15 - 14}{5} = \frac{1}{5}$.

$P_0(1/5, 7/5, 0)$

$$\therefore r = \begin{cases} x = \frac{1}{5} + t \\ y = \frac{7}{5} - 4t & t \in \mathbb{R} \\ z = 0 - 5t & \text{recta} \end{cases}$$



b) $\begin{cases} x^2 + y^2 + z^2 = 3^2 \\ z = 2 \end{cases} \Rightarrow \begin{cases} x^2 + y^2 = 3^2 - 2^2 \\ z = 2 \end{cases} \Rightarrow \begin{cases} x^2 + y^2 = 5 \\ z = 2 \end{cases}$



C: Circunferencia de centro $(0, 0, 2)$ y radio $\sqrt{5}$.
en el plano $z = 2$