EJERCICIO 2

$$P = \begin{pmatrix} -1 & -1 & 2 \\ 0 & 1 & 2 \\ -1 & -1 & a \end{pmatrix}$$

@ $|P| = (-a+2) - (-2+2) = -a+2$

$\boxed{|P| = -a+2}$ $\quad -a+2=0 \rightarrow a=2$

i) Si $a \neq 2$; $|P| \neq 0$; Rango $(P) = 3$.

ii) Si $a = 2$; $|P| = 0$; Rango $(P) < 3$

$$P = \begin{pmatrix} -1 & -1 & 2 \\ 0 & 1 & 2 \\ -1 & -1 & 2 \end{pmatrix}$$

$$|P_{2x2}| = \begin{vmatrix} -1 & -1 \\ 0 & 1 \end{vmatrix} = -1 \neq 0$$

Rango $(P) = 2$

$\boxed{\begin{array}{l} \text{Si } a=2 \text{ ; Rango}(P)=2 \\ \text{Si } a \neq 2 \text{ ; Rango}(P)=3 \end{array}}$

b) Si $a=1$, $|P| \neq 0$, POR LO TANTO, P TIENE INVERSA.

$$P = \begin{pmatrix} -1 & -1 & 2 \\ 0 & 1 & 2 \\ -1 & -1 & 1 \end{pmatrix} \qquad |P| = -1+2 = 1$$

$\rightarrow a$

$$P^{-1} = \frac{(P^t)^{Adj.}}{|P|} = \frac{\begin{pmatrix} -1 & 0 & -1 \\ -1 & 1 & -1 \\ 2 & 2 & 1 \end{pmatrix}^{Adj.}}{1} =$$

$$= \begin{pmatrix} \begin{vmatrix} 1 & -1 \\ 2 & 1 \end{vmatrix} & -\begin{vmatrix} -1 & -1 \\ 2 & 1 \end{vmatrix} & \begin{vmatrix} -1 & 1 \\ 2 & 2 \end{vmatrix} \\ -\begin{vmatrix} 0 & -1 \\ 2 & 1 \end{vmatrix} & \begin{vmatrix} -1 & -1 \\ 2 & 1 \end{vmatrix} & -\begin{vmatrix} -1 & 0 \\ 2 & 2 \end{vmatrix} \\ \begin{vmatrix} 0 & -1 \\ 1 & -1 \end{vmatrix} & -\begin{vmatrix} -1 & -1 \\ -1 & -1 \end{vmatrix} & \begin{vmatrix} -1 & 0 \\ -1 & 1 \end{vmatrix} \end{pmatrix} =$$

$$= \boxed{\begin{pmatrix} 3 & -1 & -4 \\ -2 & 1 & 2 \\ 1 & 0 & -1 \end{pmatrix}} = P^{-1}$$