

U0283319 - Mier Montoya, Juan Francisco

$$1. - \begin{pmatrix} -2 & -3 & 3 \\ 6 & 6 & -3 \\ -1 & -1 & 4 \end{pmatrix} \begin{matrix} F_1' = F_3 \\ F_3' = F_1 \end{matrix} \rightarrow \begin{pmatrix} -1 & -1 & 4 \\ 6 & 6 & -3 \\ -2 & -3 & 3 \end{pmatrix} \begin{matrix} F_1' = F_2 + 6F_3 \\ F_3' = F_3 - 2F_1 \end{matrix} \rightarrow \begin{pmatrix} -1 & -1 & 4 \\ 0 & 1 & 17 \\ 0 & -1 & -5 \end{pmatrix} \begin{matrix} F_3' = F_3 + F_1 \end{matrix}$$

$$\rightarrow \begin{pmatrix} -1 & -1 & 4 \\ 0 & 1 & 17 \\ 0 & 0 & 12 \end{pmatrix}$$

↑ determinante cambia de signo

$$\det(A) = (-1) \cdot (-1) \cdot (1) \cdot (12) = 12$$

$$2. - \begin{matrix} 4x + y + z = -80 \\ x + y + z = 1 \\ x + y + 4z = 1 \end{matrix} \begin{matrix} F_2' = F_2 - F_1 \\ F_3' = F_3 - 4F_1 \end{matrix} \rightarrow \begin{matrix} -3y - 15z = -57 \\ 3y - 3z = 0 \\ x + y + 4z = 1 \end{matrix} \begin{matrix} F_3' = F_3 + F_2 \\ -18z = -57 \end{matrix}$$

$$\begin{matrix} z = 3, \\ y = 3 - z, \\ x + 3 + 12 = 1 \\ x = -14 \end{matrix}$$

$$3. - \Delta B = \begin{pmatrix} 1 & 0 & 0 & a & 1 \\ 3 & -2 & 0 & (2a-2) & -1 \\ -1 & -1 & (a-3) & -4 & 3 \\ 2 & 3 & (2a-6) & (4a-8) & 14 \end{pmatrix}$$

$$\begin{matrix} F_2' = F_2 - 3F_1 \\ F_3' = F_3 + F_1 \\ F_4' = F_4 - 2F_1 \end{matrix}$$

$$\begin{pmatrix} 1 & 0 & 0 & a & 1 \\ 0 & -2 & 0 & -2 & -4 \\ 0 & -1 & (a-3) & (a-4) & 4 \\ 0 & 3 & (2a-6) & (2a-8) & 16 \end{pmatrix} \xrightarrow{F_2' = F_2 / (-2)} \begin{pmatrix} 1 & 0 & 0 & a & 1 \\ 0 & 1 & 0 & 1 & 2 \\ 0 & -1 & a-3 & a-4 & 4 \\ 0 & 3 & 2a-6 & 2a-8 & 16 \end{pmatrix} \begin{matrix} F_3' = F_3 + F_2 \\ F_4' = F_4 - 3F_2 \end{matrix}$$

$$\rightarrow \begin{pmatrix} 1 & 0 & 0 & a & 1 \\ 0 & 1 & 0 & 1 & 2 \\ 0 & 0 & a-3 & a-3 & 6 \\ 0 & 0 & 2a-6 & 2a-8 & 10 \end{pmatrix} \xrightarrow{F_4' = F_4 - 2F_3} \begin{pmatrix} 1 & 0 & 0 & a & 1 \\ 0 & 1 & 0 & 1 & 2 \\ 0 & 0 & a-3 & a-3 & 6 \\ 0 & 0 & 0 & -2 & -2 \end{pmatrix} \begin{matrix} F_4' = F_4 / (-2) \\ F_2' = F_2 - F_4 \\ F_1' = F_1 - aF_4 \\ F_3' = F_3 - (a-3)F_4 \end{matrix}$$

$$\rightarrow \begin{pmatrix} 1 & 0 & 0 & 0 & 1-a \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & a-3 & 0 & 9a \\ 0 & 0 & 0 & 1 & 1 \end{pmatrix} \xrightarrow{a=b} \begin{pmatrix} 1 & 0 & 0 & 0 & 5 \\ 0 & 1 & 0 & 0 & 1 \\ 0 & 0 & 3 & 0 & 45 \\ 0 & 0 & 0 & 1 & 1 \end{pmatrix} \begin{matrix} F_3' = F_3 / 3 \end{matrix}$$