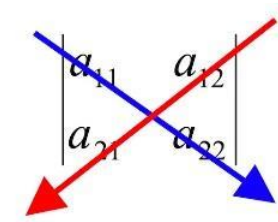


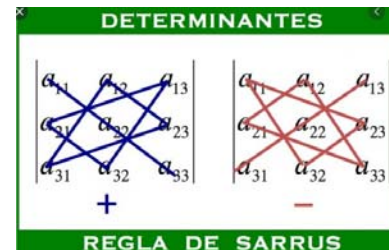
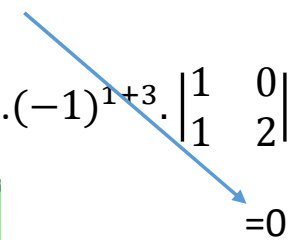
Ejercicio 21. Usar el desarrollo de Laplace para calcular el determinante de las siguientes matrices:

$$A = \begin{pmatrix} 3 & 1 \\ 4 & 2 \end{pmatrix}, \quad B = \begin{pmatrix} 2 & -1 & 0 \\ 1 & 0 & 3 \\ 1 & 2 & -1 \end{pmatrix}, \quad C = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 1 \\ 2 & 3 & -1 & 0 \\ 1 & 1 & 1 & -1 \end{pmatrix}.$$

$$|A| = \begin{vmatrix} 3 & 1 \\ 4 & 2 \end{vmatrix} = 3 \cdot (-1)^{1+1} \cdot |2| + 1 \cdot (-1)^{1+2} \cdot |4| = 3 \cdot 2 - 1 \cdot 4 = -1$$



$$|B| = \begin{vmatrix} 2 & -1 & 0 \\ 1 & 0 & 3 \\ 1 & 2 & -1 \end{vmatrix} = 2 \cdot (-1)^{1+1} \cdot \begin{vmatrix} 0 & 3 \\ 2 & -1 \end{vmatrix} + (-1) \cdot (-1)^{1+2} \cdot \begin{vmatrix} 1 & 3 \\ 1 & -1 \end{vmatrix} + 0 \cdot (-1)^{1+3} \cdot \begin{vmatrix} 1 & 0 \\ 1 & 2 \end{vmatrix} = 2 \cdot (-6) + 1 \cdot (-4) = -16$$



=0

Ejercicio 21. Usar el desarrollo de Laplace para calcular el determinante de las siguientes matrices:

$$A = \begin{pmatrix} 3 & 1 \\ 4 & 2 \end{pmatrix}, \quad B = \begin{pmatrix} 2 & -1 & 0 \\ 1 & 0 & 3 \\ 1 & 2 & -1 \end{pmatrix}, \quad C = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 1 \\ 2 & 3 & -1 & 0 \\ 1 & 1 & 1 & -1 \end{pmatrix}.$$

$$|C| = \begin{vmatrix} 1 & 2 & 3 & 0 \\ 0 & 1 & 1 & 1 \\ 2 & 3 & -1 & 0 \\ 1 & 1 & 1 & -1 \end{vmatrix} = 1 \cdot (-1)^{1+1} \cdot \begin{vmatrix} 1 & 1 & 1 \\ 3 & -1 & 0 \\ 1 & 1 & -1 \end{vmatrix} + 2 \cdot (-1)^{1+2} \cdot \begin{vmatrix} 0 & 1 & 1 \\ 2 & -1 & 0 \\ 1 & 1 & -1 \end{vmatrix} +$$

$$3 \cdot (-1)^{1+3} \cdot \begin{vmatrix} 0 & 1 & 1 \\ 2 & 3 & 0 \\ 1 & 1 & -1 \end{vmatrix} + 0 \cdot (-1)^{1+4} \cdot \begin{vmatrix} 0 & 1 & 1 \\ 2 & 3 & -1 \\ 1 & 1 & 1 \end{vmatrix} = 1 \cdot 8 - 2 \cdot 5 + 3 \cdot 1 = 1$$

=0