

UD 5 Determinantes - Video 3 - Determinante de orden mayor que 3

sábado, 17 de febrero de 2024 11:47

6. DETERMINANTE DE ORDEN MAYOR QUE 3

$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} & \dots & a_{1n} \\ a_{21} & \dots & \dots & \dots & a_{2n} \\ a_{31} & \dots & \dots & \dots & a_{3n} \\ \vdots & & & & \vdots \\ a_{n1} & \dots & \dots & \dots & a_{nn} \end{pmatrix}$$

Ejemplo

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

Fila i

$$|A| = a_{i1} A_{i1} + a_{i2} A_{i2} + a_{i3} A_{i3} + \dots + a_{in} A_{in}$$

Columna j

$$|A| = a_{1j} A_{1j} + a_{2j} A_{2j} + a_{3j} A_{3j} + \dots + a_{nj} A_{nj}$$

$$\begin{aligned} |A| &= a_{11} A_{11} + a_{21} A_{21} + a_{31} A_{31} + a_{41} A_{41} = \\ &= 1 \cdot 1 + 0 \cdot A_{21} + 1 \cdot 1 + 1 \cdot 1 = 1 + 1 + 1 = \textcircled{3} \end{aligned}$$

$$A_{11} = + \begin{vmatrix} 1 & 0 & 1 \\ 1 & -1 & 0 \\ 1 & 0 & 0 \end{vmatrix} = + \left[(0+0+0) - (-1+0+0) \right] = + [0+1] = \textcircled{1}$$

$$A_{21} = + \begin{vmatrix} -1 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 0 & 0 \end{vmatrix} = + \left[(0+0+1) - (0+0+0) \right] = + 1 = \textcircled{1}$$

$$A_{31} = - \begin{vmatrix} -1 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & -1 & 0 \end{vmatrix} = - \left[(0-1+1) - (0+1+0) \right] = - (-1) = \textcircled{1}$$

$$A_2 \begin{pmatrix} 1 & -1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & -1 & 0 \\ 1 & 1 & 0 & 0 \end{pmatrix} \xrightarrow{\substack{F_3 - F_1 \\ F_4 - F_1}} \begin{pmatrix} 1 & -1 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 0 & 2 & -2 & -1 \\ 0 & 2 & -1 & -1 \end{pmatrix}$$

$$|A| = a_{11} A_{11} + a_{21} A_{21} + a_{31} A_{31} + a_{41} A_{41} = a_{11} A_{11} = 1 \cdot 3 = 3$$

$$A_{11} = + \begin{vmatrix} 1 & 0 & 1 \\ 2 & -2 & -1 \\ 2 & -1 & -1 \end{vmatrix} = + \left[(2-2+0) - (-4+1+0) \right] = 0 + 3 = 3$$