

Matriz inversa

- Transposición de matrices

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

$$A^T = \begin{bmatrix} a_{11} & a_{21} & a_{31} \\ a_{12} & a_{22} & a_{32} \\ a_{13} & a_{23} & a_{33} \end{bmatrix}$$

- Matriz inversa

$$A = \begin{bmatrix} \overset{+}{3} & \overset{-}{4} & \overset{+}{5} \\ \overset{-}{2} & \overset{+}{3} & \overset{-}{1} \\ \overset{+}{1} & \overset{-}{5} & \overset{+}{2} \end{bmatrix}$$

1) Hallar la determinante

$$d = 3 \begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix} - 4 \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} + 5 \begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix}$$

$$d = 3(6 - 5) - 4(4 - 1) + 5(10 - 3)$$

$$d = 3(1) - 4(3) + 5(7) = 3 - 12 + 35 = 26$$

$$d = 26$$

2) Determinar los componentes algebraicos de la matriz

$$A = \begin{bmatrix} \overset{+}{3} & \overset{-}{4} & \overset{+}{5} \\ \overset{-}{2} & \overset{+}{3} & \overset{-}{1} \\ \overset{+}{1} & \overset{-}{5} & \overset{+}{2} \end{bmatrix}$$

$$A_{11} = + \begin{bmatrix} 3 & 1 \\ 5 & 2 \end{bmatrix} = (6 - 5) = 1$$

$$A_{12} = - \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} = -(4 - 1) = -3$$

$$A_{13} = + \begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix} = (10 - 3) = 7$$

$$A_{21} = - \begin{bmatrix} 4 & 5 \\ 5 & 2 \end{bmatrix} = -(8 - 25) = 17$$

$$A_{22} = + \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix} = (6 - 5) = 1$$

$$A_{23} = - \begin{bmatrix} 3 & 4 \\ 1 & 5 \end{bmatrix} = -(15 - 4) = -11$$

$$A_{31} = + \begin{bmatrix} 4 & 3 \\ 5 & 1 \end{bmatrix} = (4 - 15) = -11$$

$$A_{32} = - \begin{bmatrix} 3 & 5 \\ 2 & 1 \end{bmatrix} = -(3 - 10) = 7$$

$$A_{33} = \begin{bmatrix} 3 & 4 \\ 2 & 3 \end{bmatrix} = (9 - 8) = 1$$

3) Armar la matriz de los componentes algebraicos

$$A^c = \begin{bmatrix} 1 & -3 & 7 \\ 17 & 1 & -11 \\ -11 & 7 & 1 \end{bmatrix}$$

4) Hallar la matriz transpuesta de A^c

$$A^{cT} = \begin{bmatrix} 1 & 17 & -11 \\ -3 & 1 & 7 \\ 7 & -11 & 1 \end{bmatrix}$$

5) Hallar la inversa

$$A^{-1} = \frac{A^T}{d}$$

$$A^{-1} = \begin{bmatrix} 1/26 & 17/26 & -11/26 \\ -3/26 & 1/26 & 7/26 \\ 7/26 & -11/26 & 1/26 \end{bmatrix}$$

$$A^{-1} = \begin{bmatrix} 0,038462 & 0,653846 & -0,423077 \\ -0,115385 & 0,038462 & 0,269231 \\ 0,269231 & -0,423077 & 0,038462 \end{bmatrix}$$

$$\mathcal{B} = \begin{bmatrix} 2 & -1 & 1 \\ 3 & 5 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$