



ÁLGEBRA

ESCUELA DE INGENIERÍA INFORMÁTICA

Hoja de ejercicios

Matrices y Determinantes

1. $A = \begin{pmatrix} 1 & 1 & 2 \\ 2 & 0 & -1 \\ -6 & -1 & -2 \end{pmatrix}$, inversa: $A^{-1} = \begin{pmatrix} -\frac{1}{5} & 0 & -\frac{1}{5} \\ 2 & 2 & 1 \\ -\frac{2}{5} & -1 & -\frac{2}{5} \end{pmatrix}$

2. $B = \begin{pmatrix} 1 & 1 & 2 \\ 2 & 0 & -1 \\ -6 & -1 & 0 \end{pmatrix}$, inversa: $B^{-1} = \begin{pmatrix} -1 & -2 & -1 \\ 6 & 12 & 5 \\ -2 & -5 & -2 \end{pmatrix}$

3. $C = \begin{pmatrix} 1 & 4 & 3 \\ 2 & 5 & 4 \\ 1 & 3 & 2 \end{pmatrix}$, inversa: $C^{-1} = \begin{pmatrix} -2 & 1 & 1 \\ 0 & -1 & 2 \\ 1 & 1 & -3 \end{pmatrix}$

4. $D = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 4 & 9 \end{pmatrix}$, inversa: $D^{-1} = \begin{pmatrix} 3 & -\frac{5}{2} & \frac{1}{2} \\ -3 & 4 & -1 \\ 1 & -\frac{3}{2} & \frac{1}{2} \end{pmatrix}$

5. $E = \begin{pmatrix} 5 & 1 & 1 \\ 3 & -3 & 2 \\ 1 & -2 & 1 \end{pmatrix}$, inversa: $E^{-1} = \begin{pmatrix} 1 & -3 & 5 \\ -1 & 4 & -7 \\ -3 & 11 & -18 \end{pmatrix}$

6. $F = \begin{pmatrix} 1 & 1 & -1 \\ -1 & 0 & 1 \\ 0 & -1 & 1 \end{pmatrix}$, inversa: $F^{-1} = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{pmatrix}$

7. $G = \begin{pmatrix} 0 & 3 & 1 \\ -2 & -2 & 1 \\ 1 & 2 & 0 \end{pmatrix}$, inversa: $G^{-1} = \begin{pmatrix} -2 & 2 & 5 \\ 1 & -1 & -2 \\ -2 & 3 & 6 \end{pmatrix}$

8. $\begin{vmatrix} 1 & 7 & 1 \\ 2 & 3 & 2 \\ 5 & 1 & 4 \end{vmatrix} = 11$

9. $\begin{vmatrix} 1 & 0 & 2 & -1 \\ 1 & 1 & 2 & 1 \\ 4 & 2 & 2 & -3 \\ 0 & 2 & 1 & 4 \end{vmatrix} = 3$

10. $\begin{vmatrix} 1-\alpha & 1 & 1 & 1 \\ 1 & 1+\alpha & 1 & 1 \\ 1 & 1 & 1-\beta & 1 \\ 1 & 1 & 1 & 1+\beta \end{vmatrix} = \alpha^2\beta^2$

11. $\underbrace{\begin{vmatrix} \alpha+1 & \alpha & \cdots & \alpha & \alpha \\ \alpha & \alpha+1 & \cdots & \alpha & \alpha \\ \vdots & \vdots & \ddots & \vdots & \vdots \\ \alpha & \alpha & \cdots & \alpha+1 & \alpha \\ \alpha & \alpha & \cdots & \alpha & \alpha+1 \end{vmatrix}}_n = n.\alpha + 1$