

CORREGIR DEB E Res

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$$A = \begin{pmatrix} 1 & 2 & 1 \\ 0 & 1 & 0 \\ 2 & 0 & 3 \end{pmatrix} \quad A^{-1} = \begin{pmatrix} 3 & -6 & -1 \\ 0 & 1 & 0 \\ -2 & 4 & 1 \end{pmatrix}$$

$AA^{-1} = I$

$$\begin{pmatrix} 1 & 2 & 1 \\ 0 & 1 & 0 \\ 2 & 0 & 3 \end{pmatrix} \begin{pmatrix} 3 & -6 & -1 \\ 0 & 1 & 0 \\ -2 & 4 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

(SI)

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(18)

$$A = \begin{pmatrix} 1 & 2 \\ -1 & 0 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 2 & | & 1 & 0 \\ -1 & 0 & | & 0 & 1 \end{pmatrix} \sim \begin{pmatrix} 1 & 2 & | & 1 & 0 \\ 0 & 2 & | & 1 & 1 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & | & 0 & -1 \\ 0 & 2 & | & 1 & 1 \end{pmatrix}$$

$F_2 = F_2 + F_1$ $F_1 = F_1 - F_2$ $F_2 = F_2/2$

$$\begin{pmatrix} 1 & 0 & | & 0 & -1 \\ 0 & 1 & | & 1/2 & 1/2 \end{pmatrix} \quad A^{-1} = \begin{pmatrix} 0 & -1 \\ 1/2 & 1/2 \end{pmatrix}$$

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$$B = \begin{pmatrix} -1 & 0 \\ 2 & 4 \end{pmatrix}$$

$$\begin{pmatrix} -1 & 0 & | & 1 & 0 \\ 2 & 4 & | & 0 & 1 \end{pmatrix} \sim \begin{pmatrix} -1 & 0 & | & 1 & 0 \\ 0 & 4 & | & 2 & 1 \end{pmatrix}$$

$F_2 = F_2 + 2F_1$ $F_1 = F_1/-1$
 $F_2 = F_2/4$

$$\begin{pmatrix} 1 & 0 & | & -1 & 0 \\ 0 & 1 & | & 1/2 & 1/4 \end{pmatrix} \quad B^{-1} = \begin{pmatrix} -1 & 0 \\ 1/2 & 1/4 \end{pmatrix}$$

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$$C = \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 0 & 1 & 1 \end{pmatrix}$$

$$\begin{pmatrix} 1 & 0 & 1 & | & 1 & 0 & 0 \\ 0 & 1 & 0 & | & 0 & 1 & 0 \\ 0 & 1 & 1 & | & 0 & 0 & 1 \end{pmatrix} \sim \begin{pmatrix} 1 & 0 & 1 & | & 1 & 0 & 0 \\ 0 & 1 & 0 & | & 0 & 1 & 0 \\ 0 & 0 & 1 & | & 0 & -1 & 1 \end{pmatrix}$$

$F_3 = F_3 - F_2$ $F_1 = F_1 - F_3$

$$\begin{pmatrix} 1 & 0 & 0 & | & 1 & 1 & -1 \\ 0 & 1 & 0 & | & 0 & 1 & 0 \\ 0 & 0 & 1 & | & 0 & -1 & 1 \end{pmatrix} \quad C^{-1} = \begin{pmatrix} 1 & 1 & -1 \\ 0 & 1 & 0 \\ 0 & -1 & 1 \end{pmatrix}$$

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(21) $A^2 = 2A - I$ $A = \begin{pmatrix} 5 & -4 & 2 \\ 2 & -1 & \\ -4 & 4 & -1 \end{pmatrix}$

$A^4 = A^2 \cdot A^2$
 $= (2A - I)(2A - I)$
 $= 4A^2 - 2AI - 2IA + I^2$
 $= 4A^2 - 2A - 2A + I$
 $= 4A^2 - 4A + I$
 $= 4(2A - I) - 4A + I$
 $= 4A - 3I$
 $= \begin{pmatrix} 20 & -16 & 4 \\ 4 & -4 & 4 \\ -16 & 16 & -4 \end{pmatrix} - \begin{pmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 3 \end{pmatrix}$

$\begin{pmatrix} 17 & -16 & 4 \\ 4 & -7 & 4 \\ -16 & 16 & -7 \end{pmatrix}$

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POTENCIA DE UNA MATRIZ

$A \longrightarrow A^{100}$

$\left. \begin{matrix} A \\ A^2 \\ A^3 \\ A^4 \\ \vdots \end{matrix} \right\} \Rightarrow \text{General } A^n \xrightarrow{n=100} A^{100}$

EJ. 1 $A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$ A^{100}

① $A = A \cdot A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$

② $A^2 = A \cdot A = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 3 \\ 0 & 1 \end{pmatrix}$

③ $A^3 = A \cdot A = \begin{pmatrix} 1 & 3 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 4 \\ 0 & 1 \end{pmatrix}$

$A^0 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \Rightarrow A^{100} = \begin{pmatrix} 1 & 100 \\ 0 & 1 \end{pmatrix}$

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EJ 2 $A = \begin{pmatrix} 4 & 5 & -1 \\ -3 & -4 & 1 \\ -3 & -4 & 0 \end{pmatrix}$ A^{128} A^7 A^5 A^6

$A^2 = A \cdot A = \begin{pmatrix} 4 & 4 & 1 \\ -3 & -3 & -1 \\ 0 & 1 & -1 \end{pmatrix}$

$A^3 = A^2 \cdot A = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} = I$

$A^4 = A^3 \cdot A = I \cdot A = A$

$A^5 = A^4 \cdot A = A \cdot A = A^2$

$A^6 = A^5 \cdot A = A^2 \cdot A = A^3 = I$

$A^{128} = A^2$ $\frac{128}{6} = 21 \text{ R } 2$

$A^2 = \begin{pmatrix} 4 & 4 & 1 \\ -3 & -3 & -1 \\ 0 & 1 & -1 \end{pmatrix}$

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EC. CON MATRICES

[1] $AX = B$ $A^{-1}AX = A^{-1}B$
 $I X = A^{-1}B$
 $X = A^{-1}B$

[2] $XA = B$ $XAA^{-1} = BA^{-1}$
 $X = BA^{-1}$

[3] $AX + B = C$
 $AX = C - B$
 $A^{-1}AX = A^{-1}(C - B)$
 $X = A^{-1}(C - B)$

[2] $XA^{-1} + B = C$
 $XA^{-1} = C - B$
 $XA^{-1}A = (C - B)A$
 $X = (C - B)A$

[5] $AXB + C = I$
 $AXB = I - C$
 $A^{-1}AXB B^{-1} = A^{-1}(I - C)B^{-1}$
 $X = A^{-1}(I - C)B^{-1}$

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(24)
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(20) (22) (10)

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