CORREGIR DEBERES

① $A=\begin{pmatrix}7 & -2\\ 3 & 1\end{pmatrix}$ $B=\begin{pmatrix}-3 & 0\\ -2 & 2\end{pmatrix}$

a) $-2A+3B=\begin{pmatrix}-14 & 4\\ -6 & -2\end{pmatrix}+\begin{pmatrix}-9 & 0\\ -6 & 6\end{pmatrix}=\boxed{\begin{pmatrix}-23 & 4\\ -12 & 4\end{pmatrix}}$

b) $\frac{1}{2}AB=\frac{1}{2}\begin{pmatrix}-17 & -4\\ -11 & 2\end{pmatrix}=\boxed{\begin{pmatrix}-17/2 & -2\\ -11/2 & 1\end{pmatrix}}$

c) $B(-A)=\begin{pmatrix}-3 & 0\\ -2 & 2\end{pmatrix}\begin{pmatrix}-7 & 2\\ -3 & -1\end{pmatrix}=\boxed{\begin{pmatrix}21 & -6\\ 8 & -6\end{pmatrix}}$

$B(10A)=10BA$

d) $AA-BB$

$\begin{pmatrix}7 & -2\\ 3 & 1\end{pmatrix}\begin{pmatrix}7 & -2\\ 3 & 1\end{pmatrix}-\begin{pmatrix}-3 & 0\\ -2 & 2\end{pmatrix}\begin{pmatrix}-3 & 0\\ -2 & 2\end{pmatrix}$

$\begin{pmatrix}43 & -16\\ 24 & -5\end{pmatrix}-\begin{pmatrix}9 & 0\\ 2 & 4\end{pmatrix}=\boxed{\begin{pmatrix}34 & -16\\ 22 & -9\end{pmatrix}}$

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② $\begin{pmatrix}-3 & 2\end{pmatrix}\begin{pmatrix}1 & -1\\ 5 & 2\end{pmatrix}\begin{pmatrix}0\\ 1\end{pmatrix}$

$\underbrace{A_{1\times 2}\ B_{2\times 2}}\ C_{2\times 1}$

$\begin{pmatrix}-3\cdot 1+2\cdot 5 & (-3)(-1)+2\cdot 2\end{pmatrix}\begin{pmatrix}0\\ 1\end{pmatrix}$

$\begin{pmatrix}7 & 7\end{pmatrix}\begin{pmatrix}0\\ 1\end{pmatrix}=7\cdot 0+7\cdot 1=7$

$A_{1\times 2}\ B_{2\times 1}$

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⑨ $A=\begin{pmatrix}3 & 0 & 8\\ 3 & -1 & 6\\ -2 & 0 & -5\end{pmatrix}$ $I=\begin{pmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{pmatrix}$

$(A+I)^2=0$

$\begin{pmatrix}4 & 0 & 8\\ 3 & 0 & 6\\ -2 & 0 & -4\end{pmatrix}\begin{pmatrix}4 & 0 & 8\\ 3 & 0 & 6\\ -2 & 0 & -4\end{pmatrix}=\begin{pmatrix}0 & 0 & 0\\ 0 & 0 & 0\\ 0 & 0 & 0\end{pmatrix}$

A^2 como c.l A, I

$(A+I)^2=0$

$(A+I)(A+I)=0$

$AA+AI+IA+II=0$

$A^2+A+A+I=0$

$\boxed{A^2=-2A-I}$

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CALCULO DE INVERSA

MODO 1 Por la definición

$A.A^{-1}=I$

Ejemplo $A=\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}$

$\begin{pmatrix}1 & 2\\ 3 & 4\end{pmatrix}\begin{pmatrix}x & y\\ z & t\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

$\begin{pmatrix}x+2z & y+2t\\ 3x+4z & 3y+4t\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

$\begin{cases}\boxed{x+2z=1}\\ y+2t=0\\ \boxed{3x+4z=0}\\ 3y+4t=1\end{cases}$

$-3\begin{cases}x+2z=1\\ 3x+4z=0\end{cases}$ $-2z=-3$ $z=3/2$ $x=-2$

$-3\begin{cases}y+2t=0\\ 3y+4t=1\end{cases}$ $-2t=1$ $t=-\frac{1}{2}$ $y=1$

$\boxed{A^{-1}=\begin{pmatrix}-2 & 1\\ 3/2 & -1/2\end{pmatrix}}$ $\exists A^{-1}$ A regular

$\begin{pmatrix}1 & 2 & 3\\ 4 & 5 & 6\\ 7 & 8 & 9\end{pmatrix}\begin{pmatrix}x & y & z\\ t & u & v\\ w & k & m\end{pmatrix}=\begin{pmatrix}1 & 0 & 0\\ 0 & 1 & 0\\ 0 & 0 & 1\end{pmatrix}$

3 sist de 3 incógnitas

Ejemplo $\begin{pmatrix}2 & 1\\ 4 & 2\end{pmatrix}$

$\begin{pmatrix}2 & 1\\ 4 & 2\end{pmatrix}\begin{pmatrix}x & y\\ z & t\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

$\begin{pmatrix}2x+z & 2y+t\\ 4x+2z & 4y+2t\end{pmatrix}=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$

$\begin{cases}2x+z=1\\ 2y+t=0\\ 4x+2z=0\\ 4y+2t=1\end{cases}$ $-2\begin{cases}2x+z=1\\ 4x+2z=0\end{cases}$ $0=-2$ SI $\Downarrow$

$\nexists A^{-1}\rightarrow A$ singular

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MODO 2 Método de Gauss

$$(A|I) \sim (I|A^{-1})$$

3º 2º 1º

$$\left(\begin{array}{ccc|ccc} x & x & x & 1 & 0 & 0 \\ x & x & x & 0 & 1 & 0 \\ x & x & x & 0 & 0 & 1 \end{array}\right) \sim \left(\begin{array}{ccc|c} 1 & 0 & 0 & \\ 0 & 1 & 0 & A^{-1} \\ 0 & 0 & 1 & \end{array}\right)$$

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

$$-3 \left(\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 3 & 4 & 0 & 1 \end{array}\right) \sim \left(\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & -2 & -3 & 1 \end{array}\right)$$

$F_2 = F_2 - 3F_1$ $F_1 = F_1 + F_2$

$$\left(\begin{array}{cc|cc} 1 & 0 & -2 & 1 \\ 0 & -2 & -3 & 1 \end{array}\right) \sim \left(\begin{array}{cc|cc} 1 & 0 & -2 & 1 \\ 0 & 1 & 3/2 & -1/2 \end{array}\right)$$

$F_2 = F_2 / -2$

$$\boxed{A^{-1} = \begin{pmatrix} -2 & 1 \\ 3/2 & -1/2 \end{pmatrix}}$$

• Hallar A^{-1} $A = \begin{pmatrix} 2 & 1 \\ 4 & 2 \end{pmatrix}$

$$-2 \left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 4 & 2 & 0 & 1 \end{array}\right) \sim \left(\begin{array}{cc|cc} 2 & 1 & 1 & 0 \\ 0 & 0 & -2 & 1 \end{array}\right)$$

$F_2 = F_2 - 2F_1$

Fila o columna de cero

$\nexists A^{-1} \to A$ singular

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• Deberes

PA 659 1 a) b) c)

Por lo menos uno con los 2 método

PA 672 3

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