PAG 80 (2)

$A = \begin{pmatrix} \ell & m \\ n & p \end{pmatrix}$ $|A| = -13$

a) $\begin{vmatrix} n & p \\ \ell & m \end{vmatrix} \overset{F_1 \leftrightarrow F_2}{=} -\begin{vmatrix} \ell & m \\ n & p \end{vmatrix} = -(-13) = 13$

b) $\begin{vmatrix} \ell & 4m \\ n & 4p \end{vmatrix} = 4\begin{vmatrix} \ell & m \\ n & p \end{vmatrix} = 4(-13) = -52$

c) $|6A| = 6^2|A| = 36(-13) = -468$ ($|\alpha A| = \alpha^n |A|$, n = orden de A)

d) $|A^{-1}| = \frac{1}{|A|} = -\frac{1}{13}$

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4) $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 7$

a) $\begin{vmatrix} a & c \\ b & d \end{vmatrix} \overset{|A| = |A^t|}{=} \begin{vmatrix} a & b \\ c & d \end{vmatrix} = 7$

b) $\begin{vmatrix} b & a \\ d & c \end{vmatrix} \overset{C_1 \leftrightarrow C_2}{=} -\begin{vmatrix} a & b \\ c & d \end{vmatrix} = -7$

c) $\begin{vmatrix} 3a & b \\ 3c & d \end{vmatrix} = 3\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 3 \cdot 7 = 21$

d) $\begin{vmatrix} a & b+2a \\ c & d+2c \end{vmatrix} = \begin{vmatrix} a & b \\ c & d \end{vmatrix} + \begin{vmatrix} a & 2a \\ c & 2c \end{vmatrix}$ ($C_2 = 2C_1$)

$7 + 0 = 7$

$\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 7$ ($C_2 = C_2 - 2C_1$)

e) $\begin{vmatrix} 2a & 2b \\ 2c & 2d \end{vmatrix} = 2^2 \begin{vmatrix} a & b \\ c & d \end{vmatrix} = 4 \cdot 7 = 28$

$|\alpha A| = \alpha^n |A|$ n = orden de A

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Det orden > 3

$\begin{pmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{pmatrix}$

Matriz complementaria del elemento $a_{ij} \Rightarrow M_{ij}$ (La matriz resultante de eliminar la fila i y la columna j)

$M_{23} = \begin{pmatrix} a_{11} & a_{12} & a_{14} \\ a_{31} & a_{32} & a_{34} \\ a_{41} & a_{42} & a_{44} \end{pmatrix}$

Menor complementario del elemento a_{ij}: El determinante resultante de eliminar la fila i y la columna j

$\alpha_{21} = \begin{vmatrix} a_{12} & a_{13} & a_{14} \\ a_{32} & a_{33} & a_{34} \\ a_{42} & a_{43} & a_{44} \end{vmatrix}$

Adjunto de un elemento a_{ij}: A_{ij}

$A_{ij} = (-1)^{i+j} \alpha_{ij}$

$A_{21} = (-1)^3 \begin{vmatrix} a_{12} & a_{13} & a_{14} \\ a_{32} & a_{33} & a_{34} \\ a_{42} & a_{43} & a_{44} \end{vmatrix}$

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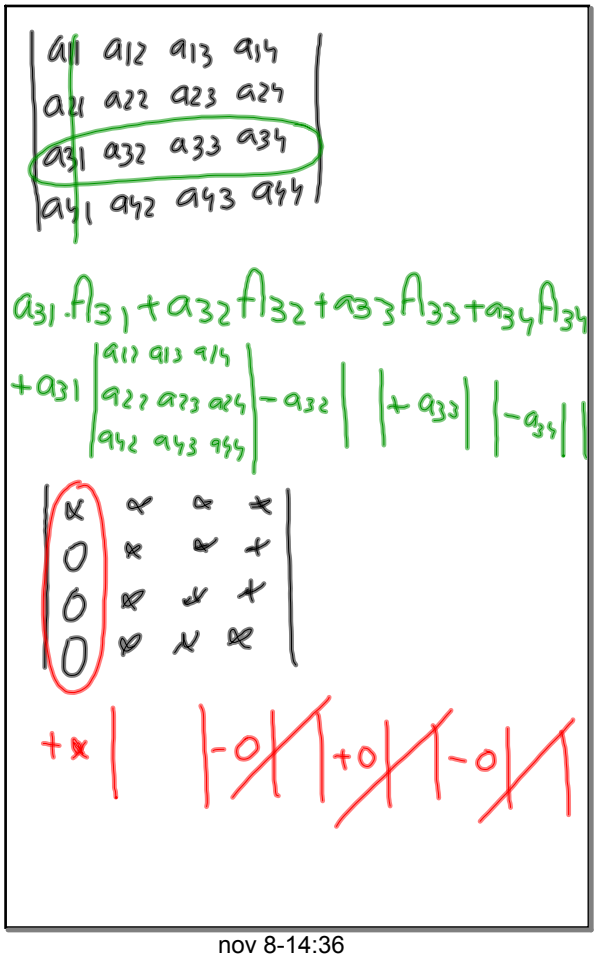
$A = \begin{pmatrix} 1 & 2 & 0 \\ 3 & -1 & 2 \\ 1 & 3 & 4 \end{pmatrix}$

Matriz compl. a_{22}: $M_{22} = \begin{pmatrix} 1 & 0 \\ 1 & 4 \end{pmatrix}$

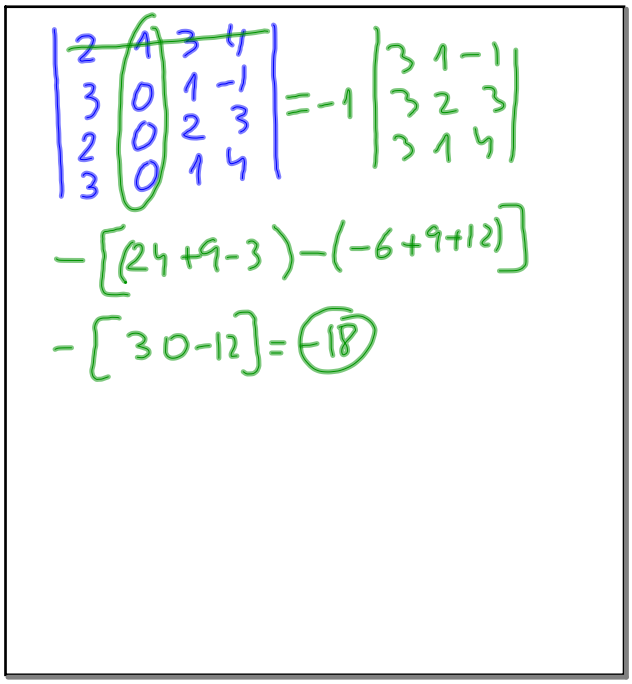
Menor compl a_{23}: $\alpha_{23} = \begin{vmatrix} 1 & 2 \\ 1 & 3 \end{vmatrix} = 1$

Adjunto a_{31}: $A_{31} = + \begin{vmatrix} 2 & 0 \\ -1 & 2 \end{vmatrix} = 4$

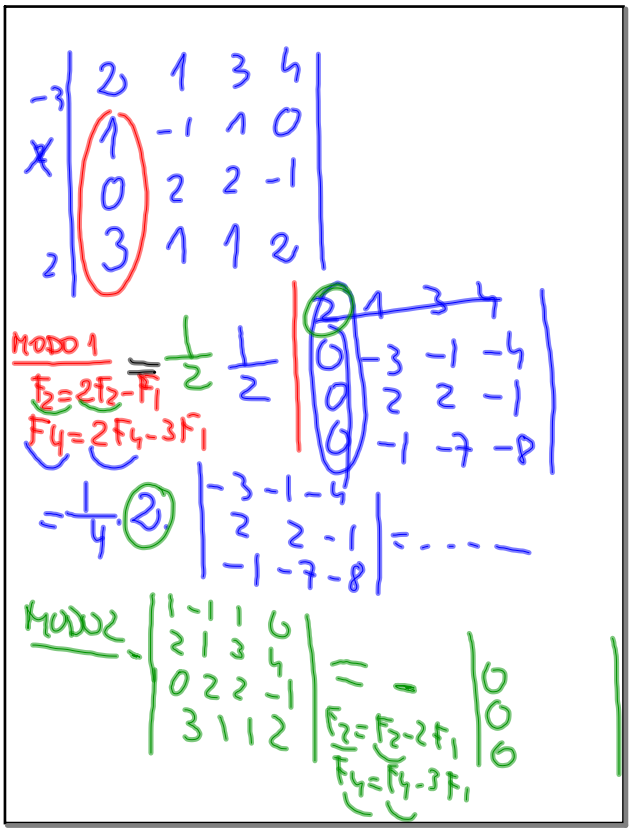
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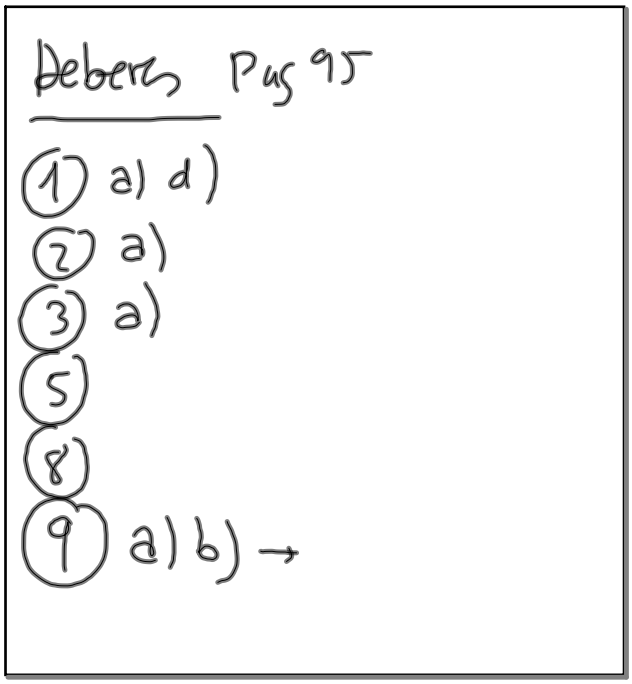
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