① $A+3B-C$

$$\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}+3\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}-\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}+\begin{pmatrix}3&3&6\\-6&0&-3\\3&9&15\end{pmatrix}-\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}4&1&6\\-5&-2&-2\\4&7&14\end{pmatrix}-\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}3&2&5\\-7&-2&-3\\1&7&13\end{pmatrix}$$

$-A+B+2C$

$$\begin{pmatrix}-1&2&0\\-1&2&-1\\-1&2&1\end{pmatrix}+\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}+\begin{pmatrix}2&-2&2\\4&0&2\\6&0&2\end{pmatrix}=\begin{pmatrix}0&3&2\\-3&2&-2\\0&5&6\end{pmatrix}+\begin{pmatrix}2&-2&2\\4&0&2\\6&0&2\end{pmatrix}=\begin{pmatrix}2&1&4\\1&2&0\\6&5&8\end{pmatrix}$$

AB

$$\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}\times\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}=\begin{pmatrix}5&1&4\\6&4&9\\4&-2&-1\end{pmatrix}$$

BA

$$\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}\times\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}=\begin{pmatrix}4&-8&-1\\-3&6&1\\9&-18&-2\end{pmatrix}$$

AC

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

CA

$$\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}\times\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}=\begin{pmatrix}1&-2&-2\\3&-6&-1\\4&-8&-1\end{pmatrix}$$

BC

$$\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}\times\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}9&-1&4\\-5&2&-3\\22&-1&9\end{pmatrix}$$

CB

$$\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}\times\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}=\begin{pmatrix}4&4&8\\3&5&9\\4&6&11\end{pmatrix}$$

ABC

$$\begin{pmatrix}5&1&4\\6&4&9\\4&-2&-1\end{pmatrix}\times\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}19&-5&10\\41&-6&19\\-3&-4&1\end{pmatrix}$$

ACB

$$\begin{pmatrix}-3&-1&-1\\0&-1&0\\-6&-1&-2\end{pmatrix}\times\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}=\begin{pmatrix}-2&-6&-10\\2&0&1\\-6&-12&-21\end{pmatrix}$$

BAC

$$\begin{pmatrix}4&-8&-1\\-3&6&1\\9&-18&-2\end{pmatrix}\times\begin{pmatrix}1&-1&1\\2&0&1\\3&0&1\end{pmatrix}=\begin{pmatrix}-15&-4&-9\\12&3&4\\-33&-9&-11\end{pmatrix}$$

BCA

$$\begin{pmatrix}9&-1&4\\-5&2&-3\\22&-1&9\end{pmatrix}\times\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}=\begin{pmatrix}12&-24&-5\\-6&12&5\\30&-60&-10\end{pmatrix}$$

CAB

$$\begin{pmatrix}1&-2&-2\\3&-6&-1\\4&-8&-1\end{pmatrix}\times\begin{pmatrix}1&1&2\\-2&0&-1\\1&3&5\end{pmatrix}=\begin{pmatrix}3&-5&-6\\14&0&7\\19&1&11\end{pmatrix}$$

CBA

$$\begin{pmatrix}4&4&8\\3&5&9\\4&6&11\end{pmatrix}\times\begin{pmatrix}1&-2&0\\1&-2&1\\1&-2&-1\end{pmatrix}=\begin{pmatrix}16&-32&-4\\17&-34&-4\\21&-42&-5\end{pmatrix}$$

② ~~A+3B-C~~, ~~-A+B+2C~~, AB, ~~BA~~, ~~AC~~, CA, BC, ~~CB~~, ABC, ~~ACB~~, ~~BAC~~, BCA, CAB y ~~CBA~~

$$A=\begin{pmatrix}2 & -1 & 1\\ 1 & 2 & 1\end{pmatrix} \quad B=\begin{pmatrix}3\\1\\-1\end{pmatrix} \quad C=\begin{pmatrix}1, & -1\end{pmatrix} \qquad A^{2\times3} \quad B^{3\times1} \quad C^{1\times2}$$

AB

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

CA

$$\begin{pmatrix}1, & -1\end{pmatrix}\times\begin{pmatrix}2 & -1 & 1\\ 1 & 2 & 1\end{pmatrix}=\begin{pmatrix}1 & -3 & 0\end{pmatrix}$$

BC

$$\begin{pmatrix}3\\1\\-1\end{pmatrix}\times\begin{pmatrix}1, & -1\end{pmatrix}=\begin{pmatrix}3 & -3\\ 1 & -1\\ -1 & 1\end{pmatrix}$$

ABC

$$\begin{pmatrix}4\\4\end{pmatrix}\times\begin{pmatrix}1, & -1\end{pmatrix}=\begin{pmatrix}4 & -4\\ 4 & -4\end{pmatrix}$$

BCA

$$\begin{pmatrix}3 & -3\\ 1 & -1\\ -1 & 1\end{pmatrix}\times\begin{pmatrix}2 & -1 & 1\\ 1 & 2 & 1\end{pmatrix}=\begin{pmatrix}3 & -9 & 0\\ 1 & -3 & 0\\ -1 & 3 & 0\end{pmatrix}$$

CAB

$$\begin{pmatrix}1 & -3 & 0\end{pmatrix}\times\begin{pmatrix}3\\1\\-1\end{pmatrix}=0$$

③ ⓐ $A^2=0$

$$A\in K^{2\times2} \quad \begin{pmatrix}0 & 1\\ 0 & 0\end{pmatrix}\times\begin{pmatrix}0 & 1\\ 0 & 0\end{pmatrix}=\begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}$$

$$A\in K^{3\times3} \quad \begin{pmatrix}0 & 0 & 1\\ 0 & 0 & 0\\ 0 & 0 & 0\end{pmatrix}\times\begin{pmatrix}0 & 0 & 1\\ 0 & 0 & 0\\ 0 & 0 & 0\end{pmatrix}=\begin{pmatrix}0 & 0 & 0\\ 0 & 0 & 0\\ 0 & 0 & 0\end{pmatrix}$$

ⓑ $A^2=-Id_2$ $\quad A\in\mathbb{R}^{2\times2}$ (*) $\begin{pmatrix}0 & 1\\ -1 & 0\end{pmatrix}\begin{pmatrix}0 & 1\\ -1 & 0\end{pmatrix}$

$$\begin{pmatrix}a & b\\ c & d\end{pmatrix}\cdot\begin{pmatrix}a & b\\ c & d\end{pmatrix}=-Id_2 \Rightarrow \begin{pmatrix}a^2+bc & ab+bd\\ ca+dc & cb+d^2\end{pmatrix}=-Id_2$$

$$\begin{cases}a^2+bc=-1\\ cb+d^2=-1\\ ab+bd=0 \longrightarrow b(a+d)=0\\ ca+dc=0 \longrightarrow c(a+d)=0\end{cases} \Rightarrow \begin{matrix}b\vee(a+d)=0\\ c\vee(a+d)=0\end{matrix}$$

$\begin{matrix}0 & a\\ -a & 0\end{matrix}$

Si $b=0 \Rightarrow$ $c\cdot0+d^2=-1$ (No posible en $\mathbb{R}$)

Si $c=0 \Rightarrow$ $0\cdot b+d^2=-1$ (No posible en $\mathbb{R}$)

$\Downarrow$ $a+d=0$

$A^2=-Id_2$.

$a+d=0$

$a=1 \quad d=-1$

$bc=-2 \quad \begin{matrix}b=2\\ c=-1\end{matrix}$

$b+b=$

ⓒ $AB\neq BA$ (Cuadradas)

$$A=\begin{pmatrix}0 & 1\\ 0 & 0\end{pmatrix} \quad B=\begin{pmatrix}1 & 0\\ 0 & 0\end{pmatrix}$$

$$AB=\begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix} \quad BA=\begin{pmatrix}0 & 1\\ 0 & 0\end{pmatrix}$$

ⓓ $A\in K^{n\times n}$, $A\neq 0$, $A\neq Id_n$ y $A^2=A$

$$A\in K^{2\times2}, \begin{pmatrix}1 & 0\\ 0 & 0\end{pmatrix} \qquad A\in K^{n\times n}\begin{pmatrix}1 & \dots & 0\\ 0 & \dots 0 \dots & 0\\ \vdots & & \\ 0 & \dots & 1\end{pmatrix}$$

ⓔ $A,B\in K^{n\times n}$ dar condiciones para que se cumpla:

ⓘ $(A+B)^2=A^2+2AB+B^2$

ⓘⓘ $(A+B)(A-B)=A^2-B^2$

ⓘ $(A+B)^2=(A+B)(A+B) \Rightarrow$

$(A+B)(A+B) = A^2+2AB+B^2$

$A^2+AB+BA+B^2 = A^2+2AB+B^2 \iff AB=BA$

ⓘⓘ $(A+B)(A-B)=A^2-B^2$

$A^2-AB+BA+B^2=A^2-B^2 \iff AB=BA$

④ⓐ $tr(A+cB)=tr(A)+c\cdot tr(B)$

$$\sum_{i=1}^{n}A_{ii}+cB_{ii}$$

$$=\sum_{i=1}^{n}A_{ii}+\sum_{i=1}^{n}cB_{ii}$$

$$=\sum_{i=1}^{n}A_{ii}+c\sum_{i=1}^{n}B_{ii}$$

$$=tr(A)+c\,tr(B)$$

ⓑ $tr(AB)=tr(BA)$ (*)

$$tr(AB)=\sum_{i=1}^{n}(AB)_{ii}=\sum_{k=1}^{n}\left(\sum_{i=1}^{n}A_{ik}B_{ki}\right)$$

$$=\sum_{k=1}^{n}\left(\sum_{i=1}^{n}B_{ki}A_{ik}\right)$$

$$=\sum_{k=1}^{n}BA_{kk}$$

$$=tr(BA)$$

⑤ⓐ Si $A,B\in K^{n\times n}$ son matrices diagonales, entonces $AB=BA$

$$A=\begin{pmatrix}a_{11} & 0 & \dots & 0\\ 0 & a_{22} & \dots & 0\\ \vdots & \vdots & \ddots & \vdots\\ 0 & 0 & \dots & a_{nn}\end{pmatrix} \quad B=\begin{pmatrix}b_{11} & 0 & \dots & 0\\ 0 & b_{22} & \dots & 0\\ \vdots & \vdots & \ddots & \vdots\\ 0 & 0 & \dots & b_{nn}\end{pmatrix}$$

$$AB=\begin{pmatrix}a_{11}b_{11} & 0 & \dots & 0\\ 0 & a_{22}b_{22} & \dots & 0\\ \vdots & \vdots & \ddots & \vdots\\ 0 & 0 & \dots & a_{nn}b_{nn}\end{pmatrix} \quad BA=\begin{pmatrix}b_{11}a_{11} & 0 & \dots & 0\\ 0 & b_{22}a_{22} & \dots & 0\\ \vdots & \vdots & \ddots & \vdots\\ 0 & 0 & \dots & b_{nn}a_{nn}\end{pmatrix}$$

Como el producto de escalares es conmutativo, $a_{ii}b_{ii}=b_{ii}a_{ii}$

ⓑ Si A es un múltiplo escalar de la matriz identidad ($A = c \cdot Id_n$ para algun $c \in k$) entonces $AB = BA \quad \forall B \in k^{n\times n}$

$$A = c \cdot Id_n \qquad \begin{array}{l} AB = c \cdot Id_n \cdot B \\ BA = B \cdot c \cdot Id_n \end{array} \quad \therefore \quad Id_n \cdot B = B \Rightarrow AB = c \cdot B \quad \therefore \quad AB = BA \quad \forall B \in k^{n\times n}$$

ⓒ Si $A \in k^{n\times n}$ cumple $AB = BA$ para toda $B \in k^{n\times n}$, entonces A es múltiplo escalar de Id_n (*)

$$Id, 0 \in Z(k^{n\times n}) = \{ AB = BA \;\; \forall B \in k^{n\times n} \} = \{ \lambda Id \mid \lambda \in k \}$$

⑥ ⓐ

Suponemos que $AB = Id_3$, $B \in k^{3\times 3}$, expandimos a la id y calculamos.

$$\left(\begin{array}{ccc|ccc} 3 & -1 & 2 & 1 & 0 & 0 \\ 2 & 1 & 1 & 0 & 1 & 0 \\ 1 & -3 & 0 & 0 & 0 & 1 \end{array}\right) \xrightarrow{f_1 - f_2} \left(\begin{array}{ccc|ccc} 1 & -2 & 1 & 1 & -1 & 0 \\ 2 & 1 & 1 & 0 & 1 & 0 \\ 1 & -3 & 0 & 0 & 0 & 1 \end{array}\right) \xrightarrow[f_3 - f_1]{f_2 - 2f_1} \left(\begin{array}{ccc|ccc} 1 & -2 & 1 & 1 & -1 & 0 \\ 0 & 5 & -1 & -2 & 3 & 0 \\ 0 & -1 & -1 & -1 & 1 & 1 \end{array}\right) \xrightarrow[f_3 \leftrightarrow f_2]{f_3 \cdot (-1)} \left(\begin{array}{ccc|ccc} 1 & -2 & 1 & 1 & -1 & 0 \\ 0 & 1 & 1 & 1 & -1 & -1 \\ 0 & 5 & -1 & -2 & 3 & 0 \end{array}\right)$$

$$\xrightarrow[f_3 - 5f_3]{f_1 + 2f_2} \left(\begin{array}{ccc|ccc} 1 & 0 & 3 & 3 & -3 & -2 \\ 0 & 1 & 1 & 1 & -1 & -1 \\ 0 & 0 & -6 & -7 & 8 & 5 \end{array}\right) \xrightarrow{f_3 \cdot (-\frac{1}{6})} \left(\begin{array}{ccc|ccc} 1 & 0 & 3 & 3 & -3 & -2 \\ 0 & 1 & 1 & 1 & -1 & -1 \\ 0 & 0 & 1 & \frac{7}{6} & -\frac{4}{3} & -\frac{5}{6} \end{array}\right) \xrightarrow[f_2 - f_3]{f_1 - 3f_3} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -\frac{1}{2} & 1 & \frac{1}{2} \\ 0 & 1 & 0 & -\frac{1}{6} & \frac{1}{3} & -\frac{1}{6} \\ 0 & 0 & 1 & \frac{7}{6} & -\frac{4}{3} & -\frac{5}{6} \end{array}\right)$$

Llegamos a que A es una matriz equivalente por filas, denotamos $B = A^{-1}$

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

ⓑ Suponemos que $AB = Id_3$, $B \in k^{3\times 3}$, expandimos a la id y calculamos.

$$\left(\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1 \end{array}\right) \xrightarrow[f_2 - f_3]{f_1 - f_2} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & -1 & 0 \\ 0 & 1 & 0 & 0 & 1 & -1 \\ 0 & 0 & 1 & 0 & 0 & 1 \end{array}\right)$$

Llegamos a que A es una matriz equivalente por filas, denotamos $B = A^{-1}$

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

ⓒ Suponemos que $AB = Id_3$, $B \in k^{3\times 3}$, expandimos a la id y calculamos.

$$\left(\begin{array}{ccc|ccc} 2 & 5 & -1 & 1 & 0 & 0 \\ 4 & -1 & 2 & 0 & 1 & 0 \\ 6 & 4 & 1 & 0 & 0 & 1 \end{array}\right) \xrightarrow{f_1 \cdot (\frac{1}{2})} \left(\begin{array}{ccc|ccc} 1 & \frac{5}{2} & -\frac{1}{2} & \frac{1}{2} & 0 & 0 \\ 4 & -1 & 2 & 0 & 1 & 0 \\ 6 & 4 & 1 & 0 & 0 & 1 \end{array}\right) \xrightarrow[f_3 - 6f_1]{f_2 - 4f_1} \left(\begin{array}{ccc|ccc} 1 & \frac{5}{2} & -\frac{1}{2} & \frac{1}{2} & 0 & 0 \\ 0 & -11 & 4 & -2 & 1 & 0 \\ 0 & -11 & 4 & -3 & 0 & 1 \end{array}\right)$$

Llegamos a un ABS. $\therefore$ no es inv.

ⓓ Suponemos que $AB = Id_4$, $B \in k^{4\times 4}$, expandimos a la id y calculamos.

$$\left(\begin{array}{cccc|cccc} 1 & 1 & 1 & 2 & 1 & 0 & 0 & 0 \\ 1 & -3 & 3 & -8 & 0 & 1 & 0 & 0 \\ -2 & 1 & 2 & -2 & 0 & 0 & 1 & 0 \\ 1 & 2 & 1 & 4 & 0 & 0 & 0 & 1 \end{array}\right) \xrightarrow{\substack{f_2 - f_1 \\ f_3 + 2f_1 \\ f_4 - f_1}} \left(\begin{array}{cccc|cccc} 1 & 1 & 1 & 2 & 1 & 0 & 0 & 0 \\ 0 & -4 & 2 & -10 & -1 & 1 & 0 & 0 \\ 0 & 3 & 4 & 2 & 2 & 0 & 1 & 0 \\ 0 & 1 & 0 & 2 & -1 & 0 & 0 & 1 \end{array}\right) \xrightarrow{f_2 \leftrightarrow f_4} \left(\begin{array}{cccc|cccc} 1 & 1 & 1 & 2 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 2 & -1 & 0 & 0 & 1 \\ 0 & 3 & 4 & 2 & 2 & 0 & 1 & 0 \\ 0 & -4 & 2 & -10 & -1 & 1 & 0 & 0 \end{array}\right)$$

$$\xrightarrow{\substack{f_1 - f_2 \\ f_3 - 3f_2 \\ f_4 + 4f_1}} \left(\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 1 & -1 & 1 & -2 \\ 0 & 1 & 0 & 2 & -1 & 0 & 0 & 1 \\ 0 & 0 & 4 & -4 & 5 & 0 & 1 & -3 \\ 0 & 0 & 2 & -2 & 3 & -3 & 4 & -8 \end{array}\right) \xrightarrow{f_3 \cdot (\frac{1}{4})} \left(\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 1 & -1 & 1 & -2 \\ 0 & 1 & 0 & 2 & -1 & 0 & 0 & 1 \\ 0 & 0 & 1 & -1 & \frac{5}{4} & 0 & \frac{1}{4} & -\frac{3}{4} \\ 0 & 0 & 2 & -2 & 3 & -3 & 4 & -8 \end{array}\right) \xrightarrow{f_4 \cdot (\frac{1}{2})} \left(\begin{array}{cccc|cccc} 1 & 0 & 1 & 0 & 1 & -1 & 1 & -2 \\ 0 & 1 & 0 & 2 & -1 & 0 & 0 & 1 \\ 0 & 0 & 1 & -1 & \frac{5}{4} & 0 & \frac{1}{4} & -\frac{3}{4} \\ 0 & 0 & 1 & -1 & \frac{3}{2} & -\frac{3}{2} & 2 & -4 \end{array}\right)$$

Llegamos a un ABS $\therefore$ No es inv

⑦

ⓐ Suponemos que $AB = Id_3$, $B \in k^{3\times 3}$, expandimos a la id y calculamos.

$$\left(\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 2 & 1 & 3 & 0 & 1 & 0 \\ 3 & 0 & i & 0 & 0 & 1 \end{array}\right) \xrightarrow[f_3 - 3f_1]{f_2 - 2f_1} \left(\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & -3 & -5 & -2 & 1 & 0 \\ 0 & -6 & i-3 & -3 & 0 & 1 \end{array}\right) \xrightarrow{f_2 \cdot (-\frac{1}{3})} \left(\begin{array}{ccc|ccc} 1 & 2 & 1 & 1 & 0 & 0 \\ 0 & 1 & \frac{5}{3} & \frac{2}{3} & -\frac{1}{3} & 0 \\ 0 & -6 & i-3 & -3 & 0 & 1 \end{array}\right) \xrightarrow[f_3 + 6f_2]{f_1 - 2f_2} \left(\begin{array}{ccc|ccc} 1 & 0 & -\frac{7}{3} & -\frac{1}{3} & \frac{2}{3} & 0 \\ 0 & 1 & \frac{5}{3} & \frac{2}{3} & -\frac{1}{3} & 0 \\ 0 & 0 & 7+i & 3 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{3 \cdot *} \left(\begin{array}{ccc|ccc} 1 & 0 & -\frac{7}{3} & -\frac{1}{3} & \frac{2}{3} & 0 \\ 0 & 1 & \frac{5}{3} & \frac{2}{3} & -\frac{1}{3} & 0 \\ 0 & 0 & 1 & -\frac{21}{5} + \frac{3}{50}i & 0 & \frac{7}{50} - \frac{1}{50}i \end{array}\right) \xrightarrow[f_2 - \frac{5}{3}f_3]{f_1 + \frac{7}{3}f_3} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -\frac{152}{15} + \frac{7}{50}i & \frac{2}{3} & \frac{49}{150} - \frac{7}{150}i \\ 0 & 1 & 1 & \frac{23}{3} - \frac{1}{10}i & -\frac{1}{3} & -\frac{7}{30} + \frac{1}{30}i \\ 0 & 0 & 1 & -\frac{21}{5} + \frac{3}{50}i & 0 & \frac{7}{50} - \frac{1}{50}i \end{array}\right)$$

Llegamos a que A es una matriz equivalente por filas, denotamos $B = A^{-1}$

$$A' = \begin{pmatrix} -\frac{152}{15} + \frac{7}{50}i & \frac{2}{3} & \frac{49}{150} - \frac{7}{150}i \\ \frac{23}{3} - \frac{1}{10}i & -\frac{1}{3} & -\frac{7}{30} + \frac{1}{30}i \\ -\frac{21}{5} + \frac{3}{50}i & 0 & \frac{7}{50} - \frac{1}{50}i \end{pmatrix}$$

$$(7+i) \cdot x = 1$$

$$x = \frac{1}{7+i} \cdot \frac{7-i}{7-i}$$

$$x = \frac{7-i}{49-i^2}$$

$$x = \frac{7-i}{50} = \frac{7}{50} - \frac{1}{50}i \;\; (*)$$

Falta 8 9 y 10