PROBLEMAS MATRICES

1 $A=\begin{pmatrix}4 & -8\\ -4 & 12\end{pmatrix}$ $B=\begin{pmatrix}12 & 9\\ -12 & 3\end{pmatrix}$

Obtén las matrices X e Y cumpliendo:

$$\begin{cases}2X+3Y=A \xrightarrow{\times 3} 6X+9Y=3A\\ 6X-2Y=B \xrightarrow{\times(-1)} -6X+2Y=-B\end{cases}$$

$$11Y=3A-B$$

Otra opción es usar Gauss (F_2-3F_1)

$$\Rightarrow \boxed{Y}=\frac{1}{11}(3A-B)=$$

$$=\frac{1}{11}\left(3\cdot\begin{pmatrix}4 & -8\\ -4 & 12\end{pmatrix}-\begin{pmatrix}12 & 9\\ -12 & 3\end{pmatrix}\right)=$$

$$=\frac{1}{11}\left(\begin{pmatrix}12 & -24\\ -12 & 36\end{pmatrix}-\begin{pmatrix}12 & 9\\ -12 & 3\end{pmatrix}\right)=$$

$$=\frac{1}{11}\begin{pmatrix}0 & -33\\ 0 & 33\end{pmatrix}=\boxed{\begin{pmatrix}0 & -3\\ 0 & 3\end{pmatrix}}$$

$2X+3Y=A$

$$\Rightarrow \boxed{X}=\frac{1}{2}(A-3Y)=\frac{1}{2}\left(\begin{pmatrix}4 & -8\\ -4 & 12\end{pmatrix}-3\cdot\begin{pmatrix}0 & -3\\ 0 & 3\end{pmatrix}\right)=$$

$$=\frac{1}{2}\left(\begin{pmatrix}4 & -8\\ -4 & 12\end{pmatrix}-\begin{pmatrix}0 & -9\\ 0 & 9\end{pmatrix}\right)=\frac{1}{2}\begin{pmatrix}4 & 1\\ -4 & 3\end{pmatrix}=\boxed{\begin{pmatrix}2 & \frac{1}{2}\\ -2 & \frac{3}{2}\end{pmatrix}}$$

Luego $\boxed{X=\begin{pmatrix}2 & \frac{1}{2}\\ -2 & \frac{3}{2}\end{pmatrix},\ Y=\begin{pmatrix}0 & -3\\ 0 & 3\end{pmatrix}}$

cumplen esas dos ecuaciones.