EJERCICIO 42BE2439e:

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

Resolver: $XAB-XC=2C$

$$X(AB-C)=2C$$

$$X(AB-C)\cdot(AB-C)^{-1}=2C\cdot(AB-C)^{-1}$$

$$X\cdot I=2C(AB-C)^{-1}$$

$$\boxed{X=2C(AB-C)^{-1}}$$

¿$(AB-C)^{-1}$?

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

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

$$=\begin{pmatrix}3&2\\10&7\end{pmatrix}-\begin{pmatrix}1&2\\1&3\end{pmatrix}=$$

$$\boxed{AB-C=\begin{pmatrix}2&0\\9&4\end{pmatrix}}$$

$$(AB-C)^{-1} = \frac{[(AB-C)^t]^{Adj}}{|AB-C|} = \frac{\left[\begin{pmatrix} 2 & 9 \\ 0 & 4 \end{pmatrix}\right]^{Adj}}{\begin{vmatrix} 2 & 0 \\ 9 & 4 \end{vmatrix}} =$$

$$= \frac{\begin{pmatrix} 4 & 0 \\ -9 & 2 \end{pmatrix}}{8} = \begin{pmatrix} \frac{4}{8} & \frac{0}{8} \\ -\frac{9}{8} & \frac{2}{8} \end{pmatrix} = \begin{pmatrix} \frac{1}{2} & 0 \\ -\frac{9}{8} & \frac{1}{4} \end{pmatrix}$$

$$X = 2C \cdot (AB-C)^{-1} = 2 \cdot \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix} \cdot \begin{pmatrix} \frac{1}{2} & 0 \\ -\frac{9}{8} & \frac{1}{4} \end{pmatrix} =$$

$$= \begin{pmatrix} 2 & 4 \\ 2 & 6 \end{pmatrix} \cdot \begin{pmatrix} 1/2 & 0 \\ -9/8 & 1/4 \end{pmatrix} =$$

$$= \begin{pmatrix} 2\cdot\frac{1}{2} - 4\cdot\frac{9}{8} & 0+1 \\ 1 - \frac{54}{8} & 0+\frac{6}{4} \end{pmatrix} = \begin{pmatrix} 1-\frac{36}{8} & 1 \\ 1-\frac{54}{8} & \frac{3}{2} \end{pmatrix}$$

$$= \begin{pmatrix} 1-\frac{9}{2} & 1 \\ 1-\frac{27}{4} & \frac{3}{2} \end{pmatrix}$$

$$\boxed{X = \begin{pmatrix} -\frac{7}{2} & 1 \\ -\frac{23}{4} & \frac{3}{2} \end{pmatrix}}$$