$$\Leftrightarrow \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -1 & 0 & -1 \\ 0 & 1 & \frac{1}{2} & 1 & 0 & \frac{1}{2} \\ 0 & 0 & -2 & -1 & 1 & 0 \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -1 & 0 & -1 \\ 0 & 1 & \frac{1}{2} & 1 & 0 & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} & -\frac{1}{2} & 0 \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & -1 & 0 & -1 \\ 0 & 1 & 0 & \frac{3}{4} & \frac{1}{4} & \frac{1}{2} \\ 0 & 0 & 1 & \frac{1}{2} & -\frac{1}{2} & 0 \end{array}\right)$$

Donc, la matrice inverse :

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

$$B = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & -3 & 3 \end{pmatrix} \quad \det(B) = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -3 & 3 & 1 \end{pmatrix}$$

$$= 1 \times 1 \times 1 = 1$$

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

$$\begin{vmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 1 & 3 & a \end{vmatrix} = 1 \times \begin{vmatrix} 2 & 4 \\ 3 & a \end{vmatrix} - 1 \times \begin{vmatrix} 1 & 4 \\ 1 & a \end{vmatrix} + 1 \times \begin{vmatrix} 1 & 2 \\ 1 & 3 \end{vmatrix}$$