$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix},$$

$$\begin{vmatrix} 1 & a & 0 & 0 \\ -1 & 2-a & a & 0 \\ 0 & -2 & 3-a & a \\ 0 & 0 & -3 & 4-a \end{vmatrix} =$$

$$B=[\alpha_1,\alpha_2,\alpha_3]\begin{bmatrix}1&0&0\\-2&-3&-4\\2&2&2\end{bmatrix}=[\alpha_1,\alpha_2,\alpha_3]\begin{bmatrix}1&0&0\\2&3&4\\-2&-2&-2\end{bmatrix}$$

$$A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix}$$