

$$\begin{aligned}
4.14 \quad 1) \quad & \begin{vmatrix} 2 & 1 & -5 & 1 \\ 1 & -3 & 0 & -6 \\ 0 & 2 & -1 & 2 \\ 1 & 4 & -7 & 6 \end{vmatrix} \xrightarrow[\substack{L_1 \rightarrow L_1 - 2L_2 \\ L_4 \rightarrow L_4 - L_2}]{=} \begin{vmatrix} 0 & 7 & -5 & 13 \\ 1 & -3 & 0 & -6 \\ 0 & 2 & -1 & 2 \\ 0 & 7 & -7 & 12 \end{vmatrix} = -1 \begin{vmatrix} 7 & -5 & 13 \\ 2 & -1 & 2 \\ 7 & -7 & 12 \end{vmatrix} \\
& \xrightarrow[\substack{C_1 \rightarrow C_1 + 2C_2 \\ C_3 \rightarrow C_3 + 2C_2}]{=} -1 \begin{vmatrix} -3 & -5 & 3 \\ 0 & -1 & 0 \\ -7 & -7 & -2 \end{vmatrix} = -1 \cdot (-1) \begin{vmatrix} -3 & 3 \\ -7 & -2 \end{vmatrix} \\
& = -1 \cdot (-1) \cdot 3 \cdot (-1) \begin{vmatrix} -1 & 1 \\ 7 & 2 \end{vmatrix} = 27 \\
\\
2) \quad & \begin{vmatrix} 2 & 1 & -1 & 1 \\ 1 & 6 & 2 & -3 \\ 3 & -1 & -1 & 2 \\ 2 & 3 & 1 & -1 \end{vmatrix} \xrightarrow[\substack{C_1 \rightarrow C_1 - 2C_2 \\ C_3 \rightarrow C_3 + C_2 \\ C_4 \rightarrow C_4 - C_2}]{=} \begin{vmatrix} 0 & 1 & 0 & 0 \\ -11 & 6 & 8 & -9 \\ 5 & -1 & -2 & 3 \\ -4 & 3 & 4 & -4 \end{vmatrix} = -1 \begin{vmatrix} -11 & 8 & -9 \\ 5 & -2 & 3 \\ -4 & 4 & -4 \end{vmatrix} \\
& = -1 \cdot (-4) \begin{vmatrix} -11 & 8 & -9 \\ 5 & -2 & 3 \\ 1 & -1 & 1 \end{vmatrix} \xrightarrow[\substack{C_2 \rightarrow C_2 + C_1 \\ C_3 \rightarrow C_3 - C_1}]{=} 4 \begin{vmatrix} -11 & -3 & 2 \\ 5 & 3 & -2 \\ 1 & 0 & 0 \end{vmatrix} \\
& = 4 \cdot 1 \begin{vmatrix} -3 & 2 \\ 3 & -2 \end{vmatrix} = 4 \cdot 1 \cdot 3 \cdot 2 \begin{vmatrix} -1 & 1 \\ 1 & -1 \end{vmatrix} = 0 \\
\\
3) \quad & \begin{vmatrix} -1 & -1 & 1 & 0 \\ 2 & 1 & 1 & 3 \\ 0 & 1 & 1 & 2 \\ 1 & 3 & -1 & 2 \end{vmatrix} \xrightarrow[\substack{C_1 \rightarrow C_1 + C_3 \\ C_2 \rightarrow C_2 + C_3}]{=} \begin{vmatrix} 0 & 0 & 1 & 0 \\ 3 & 2 & 1 & 3 \\ 1 & 2 & 1 & 2 \\ 0 & 2 & -1 & 2 \end{vmatrix} = 1 \begin{vmatrix} 3 & 2 & 3 \\ 1 & 2 & 2 \\ 0 & 2 & 2 \end{vmatrix} = 1 \cdot 2 \begin{vmatrix} 3 & 2 & 3 \\ 1 & 2 & 2 \\ 0 & 1 & 1 \end{vmatrix} \\
& \xrightarrow[\substack{C_3 \rightarrow C_3 - C_2}]{=} 2 \begin{vmatrix} 3 & 2 & 1 \\ 1 & 2 & 0 \\ 0 & 1 & 0 \end{vmatrix} = 2 \cdot 1 \begin{vmatrix} 1 & 2 \\ 0 & 1 \end{vmatrix} = 2
\end{aligned}$$