4.13

1) $$\begin{vmatrix} 1 & 2 & 3 \\ 4 & -2 & 3 \\ 2 & 5 & -1 \end{vmatrix} \overset{\substack{C_2 \to C_2 - 2C_1 \\ C_3 \to C_3 - 3C_1}}{=} \begin{vmatrix} 1 & 0 & 0 \\ 4 & -10 & -9 \\ 2 & 1 & -7 \end{vmatrix} = 1 \begin{vmatrix} -10 & -9 \\ 1 & -7 \end{vmatrix} = 79$$

2) $$\begin{vmatrix} 2 & 0 & 1 \\ 4 & 2 & -3 \\ 5 & 3 & 1 \end{vmatrix} \overset{C_1 \to C_1 - 2C_3}{=} \begin{vmatrix} 0 & 0 & 1 \\ 10 & 2 & -3 \\ 3 & 3 & 1 \end{vmatrix} = 1 \begin{vmatrix} 10 & 2 \\ 3 & 3 \end{vmatrix} = 1 \cdot 2 \cdot 3 \begin{vmatrix} 5 & 1 \\ 1 & 1 \end{vmatrix} = 24$$

3) $$\begin{vmatrix} 2 & 0 & 1 \\ 3 & 2 & -3 \\ -1 & -3 & 5 \end{vmatrix} \overset{C_1 \to C_1 - 2C_3}{=} \begin{vmatrix} 0 & 0 & 1 \\ 9 & 2 & -3 \\ -11 & -3 & 5 \end{vmatrix} = 1 \begin{vmatrix} 9 & 2 \\ -11 & -3 \end{vmatrix} = -5$$

4) $$\begin{vmatrix} 3 & 2 & -4 \\ 1 & 0 & -2 \\ -2 & 3 & 3 \end{vmatrix} \overset{C_3 \to C_3 + 2C_1}{=} \begin{vmatrix} 3 & 2 & 2 \\ 1 & 0 & 0 \\ -2 & 3 & -1 \end{vmatrix} = -1 \begin{vmatrix} 2 & 2 \\ 3 & -1 \end{vmatrix} = -1 \cdot 2 \begin{vmatrix} 1 & 1 \\ 3 & -1 \end{vmatrix} = 8$$

5) $$\begin{vmatrix} 1 & 2 & 3 \\ 3 & 2 & 1 \\ 1 & 3 & 2 \end{vmatrix} \overset{\substack{L_2 \to L_2 - 3L_1 \\ L_3 \to L_3 - L_1}}{=} \begin{vmatrix} 1 & 2 & 3 \\ 0 & -4 & -8 \\ 0 & 1 & -1 \end{vmatrix} = 1 \begin{vmatrix} -4 & -8 \\ 1 & -1 \end{vmatrix} = 1 \cdot (-4) \begin{vmatrix} 1 & 2 \\ 1 & -1 \end{vmatrix} = 12$$

6) $$\begin{vmatrix} 4 & -3 & 2 \\ 5 & 9 & -7 \\ 4 & -1 & 4 \end{vmatrix} \overset{\substack{C_1 \to C_1 + 4C_2 \\ C_3 \to C_3 + 4C_2}}{=} \begin{vmatrix} -8 & -3 & -10 \\ 41 & 9 & 29 \\ 0 & -1 & 0 \end{vmatrix} = -(-1) \begin{vmatrix} -8 & -10 \\ 41 & 29 \end{vmatrix}$$

$$= 1 \cdot (-2) \begin{vmatrix} 4 & 5 \\ 41 & 29 \end{vmatrix} = 178$$