

8.6

$$1) \begin{vmatrix} 1 & 2 & 3 \\ 4 & -2 & 3 \\ 2 & 5 & -1 \end{vmatrix} \begin{array}{l} C_2 \rightarrow C_2 - 2C_1 \\ C_3 \rightarrow C_3 - 3C_1 \\ = \end{array} \begin{vmatrix} 1 & 0 & 0 \\ 4 & -10 & -9 \\ 2 & 1 & -7 \end{vmatrix} = 1 \begin{vmatrix} -10 & -9 \\ 1 & -7 \end{vmatrix} \\ = (-10) \cdot (-7) - 1 \cdot (-9) = 79$$

$$2) \begin{vmatrix} 2 & 0 & 1 \\ 4 & 2 & -3 \\ 5 & 3 & 1 \end{vmatrix} \begin{array}{l} C_1 \rightarrow C_1 - 2C_3 \\ = \end{array} \begin{vmatrix} 0 & 0 & 1 \\ 10 & 2 & -3 \\ 3 & 3 & 1 \end{vmatrix} = 1 \begin{vmatrix} 10 & 2 \\ 3 & 3 \end{vmatrix} = 2 \cdot 3 \begin{vmatrix} 5 & 1 \\ 1 & 1 \end{vmatrix} \\ = 6(5 \cdot 1 - 1 \cdot 1) = 24$$

$$3) \begin{vmatrix} 2 & 0 & 1 \\ 3 & 2 & -3 \\ -1 & -3 & 5 \end{vmatrix} \begin{array}{l} C_1 \rightarrow C_1 - 2C_3 \\ = \end{array} \begin{vmatrix} 0 & 0 & 1 \\ 9 & 2 & -3 \\ -11 & -3 & 5 \end{vmatrix} = 1 \begin{vmatrix} 9 & 2 \\ -11 & -3 \end{vmatrix} \\ = 9 \cdot (-3) - (-11) \cdot 2 = -5$$

$$4) \begin{vmatrix} 3 & 2 & -4 \\ 1 & 0 & -2 \\ -2 & 3 & 3 \end{vmatrix} \begin{array}{l} L_1 \rightarrow L_1 - 3L_2 \\ L_3 \rightarrow L_3 + 2L_2 \\ = \end{array} \begin{vmatrix} 0 & 2 & 2 \\ 1 & 0 & -2 \\ 0 & 3 & -1 \end{vmatrix} = -1 \begin{vmatrix} 2 & 2 \\ 3 & -1 \end{vmatrix} \\ = -2 \begin{vmatrix} 1 & 1 \\ 3 & -1 \end{vmatrix} = -2(1 \cdot (-1) - 3 \cdot 1) = 8$$

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

$$6) \begin{vmatrix} 4 & -3 & 2 \\ 5 & 9 & -7 \\ 4 & -1 & 4 \end{vmatrix} \begin{array}{l} C_1 \rightarrow C_1 + 4C_2 \\ C_3 \rightarrow C_3 + 4C_2 \\ = \end{array} \begin{vmatrix} -8 & -3 & -10 \\ 41 & 9 & 29 \\ 0 & -1 & 0 \end{vmatrix} = -(-1) \begin{vmatrix} -8 & -10 \\ 41 & 29 \end{vmatrix} \\ -2 \begin{vmatrix} 4 & 5 \\ 41 & 29 \end{vmatrix} = -2(4 \cdot 29 - 5 \cdot 41) = 178$$