

$$1) \begin{vmatrix} -1 & 2 & -1 & -4 \\ 2 & -1 & -2 & 3 \\ 1 & 4 & 1 & -2 \\ 3 & 2 & 2 & 1 \end{vmatrix}$$

$$2) \begin{pmatrix} x & 2 & 4 \\ -1 & 1 & x \\ 3 & x & -2 \end{pmatrix}$$

$$A^{-1} = ?$$

$$\begin{vmatrix} -1 & 2 & -1 & -4 \\ 2 & -1 & -2 & 3 \\ 0 & 6 & 0 & -6 \\ 3 & 2 & 2 & 1 \end{vmatrix} = \begin{vmatrix} -1 & 2 & -1 & -2 \\ 2 & -1 & -2 & 2 \\ 0 & 6 & 0 & 0 \\ 3 & 2 & 2 & 3 \end{vmatrix}$$

$$6 \cdot (-1)^5 \cdot A_{32} = -6 \cdot \begin{vmatrix} -1 & -1 & -2 \\ 2 & -2 & 2 \\ 3 & 2 & 3 \end{vmatrix}$$

$$-6 \cdot \begin{pmatrix} 6 & -6 & -8 \\ \ominus & & \\ 12 & +6 & -4 \end{pmatrix} = -6 \cdot (-8 - 14) = \underline{\underline{132}}$$

$$\begin{vmatrix} -1 & 2 & -1 & -4 \\ 2 & -1 & -2 & 3 \\ 1 & 4 & 1 & -2 \\ 3 & 2 & 2 & 1 \end{vmatrix} = \begin{vmatrix} -1 & 2 & -2 & -4 \\ 2 & -1 & 0 & 3 \\ 1 & 4 & 2 & -2 \\ 3 & 2 & 5 & 1 \end{vmatrix}$$

$$\begin{vmatrix} -1 & 2 & -2 & -4 \\ 2 & -1 & 0 & 3 \\ 0 & 6 & 0 & -6 \\ 3 & 2 & 5 & 1 \end{vmatrix} = -2 \cdot (-1)^4 \cdot \begin{vmatrix} 2 & -1 & 3 \\ 0 & 6 & -6 \\ 3 & 2 & 1 \end{vmatrix} + 5 \cdot (-1)^7 \cdot \begin{vmatrix} -1 & 2 & -4 \\ 2 & -1 & 3 \\ 0 & 6 & -6 \end{vmatrix}$$

$$-2 \cdot \begin{pmatrix} 12 + 18 \\ \ominus \\ 54 - 24 \end{pmatrix} + (-5) \cdot \begin{pmatrix} -6 - 48 \\ \ominus \\ -24 - 18 \end{pmatrix}$$

$$-2 \cdot (30 - 30) - 5 \cdot (-54 - (-42)) = 60$$

$$2) \begin{vmatrix} x & 2 & 4 \\ -1 & 1 & x \\ 3 & x & -2 \end{vmatrix} = \begin{cases} -2x + 6x - 4x \\ \ominus \\ 12 + 4 + x^3 \end{cases} \left. \vphantom{\begin{vmatrix} x & 2 & 4 \\ -1 & 1 & x \\ 3 & x & -2 \end{vmatrix}} \right\} -16 - x^3 \neq 0$$

$$x^3 \neq -16 \quad x \neq \sqrt[3]{-16} \Rightarrow \text{regulär}$$

$$3) \begin{pmatrix} 1 & 2 & 4 \\ 3 & -1 & 2 \\ -2 & 1 & 3 \end{pmatrix} = A \quad \rightarrow A^{-1} = ? \quad \det(A) = -27$$

$$-\frac{1}{27} \cdot \begin{pmatrix} -5 & -13 & 1 \\ -2 & 11 & -5 \\ 8 & +10 & -7 \end{pmatrix}^T = \frac{1}{27} \begin{pmatrix} 5 & 2 & -8 \\ 13 & -11 & -10 \\ -1 & 5 & 7 \end{pmatrix}$$