

Inverse Matrix mit Gauß-Algorithmus

$$A = \begin{pmatrix} 1 & 3 \\ 4 & 6 \end{pmatrix}$$

$$\begin{array}{l} \text{I} \\ \text{II} \end{array} \left| \begin{array}{cc|cc} 1 & 3 & 1 & 0 & 1 & 0 & (-4) \\ 4 & 6 & 0 & 1 & 0 & 1 & 0 \end{array} \right| \begin{array}{l} \\ \leftarrow \oplus \end{array}$$
$$\begin{array}{l} \text{NR1} \\ \text{IIa} \end{array} \left| \begin{array}{cc|cc} -4 & -12 & -4 & 0 \\ 4 & 6 & 0 & 1 \end{array} \right|$$

$$\begin{array}{l} \text{I} \\ \text{IIa} \end{array} \left| \begin{array}{cc|cc} 1 & 3 & 1 & 0 & 1 & 0 & 2 \\ 0 & -6 & -4 & 1 & 0 & 1 & 0 \end{array} \right| \begin{array}{l} \\ \oplus \end{array}$$

$$\begin{array}{l} \text{NR2} \\ \text{IIa} \end{array} \left| \begin{array}{cc|cc} 2 & 6 & 2 & 0 \\ 0 & -6 & -4 & 1 \end{array} \right|$$

$$\begin{array}{l} \text{IIa} \\ \text{IIa} \end{array} \left| \begin{array}{cc|cc} 2 & 0 & -2 & 1 & 1 & 2 \\ 0 & -6 & -4 & 1 & 1 & -6 \end{array} \right| \begin{array}{l} | : 2 \\ | : (-6) \end{array}$$

$$\begin{array}{l} \text{IIb} \\ \text{IIb} \end{array} \left| \begin{array}{cc|cc} 1 & 0 & -1 & 1/2 \\ 0 & 1 & 2/3 & -1/6 \end{array} \right| \Rightarrow A^{-1} = \begin{pmatrix} -1 & 1/2 \\ 2/3 & -1/6 \end{pmatrix}$$

$$\text{Kontrolle: } A \cdot A^{-1} = \begin{pmatrix} 1 & 3 \\ 4 & 6 \end{pmatrix} \cdot \begin{pmatrix} -1 & 1/2 \\ 2/3 & -1/6 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} = E_2 \quad \checkmark$$

Weitere Übungen

$$A = \begin{pmatrix} 2 & 1 \\ -2 & 5 \end{pmatrix}$$

$$A = \begin{pmatrix} 8 & 3 \\ 4 & 1 \end{pmatrix}$$

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 6 \end{pmatrix}$$