I

$$A \cdot \vec{x} = \vec{b} \quad | \, A^{-1}_{L}$$

$$\vec{x} = A^{-1} \cdot \vec{b}$$

1. Det (A) <> 0
   regulär

2. $A_{11} \ldots A_{nn}$

3. Vektorprodukt
   (äußere)

II.

$$\det(A - \lambda E) = 0$$

Eigenwerte

$$A \cdot \vec{x} = \lambda \cdot \vec{x}$$

3) Eigenwerte : $\det(A - \lambda \cdot E) = 0$

$$(-\lambda^3 + 5\lambda^2 - 2\lambda - 8) : (\lambda + 1) = \underbrace{-\lambda^2 + 6\lambda - 8}$$

$$-(-\lambda^3 - \lambda^2)$$

$$6\lambda^2 - 2\lambda - 8$$

$$-(6\lambda^2 + 6\lambda)$$

$$-8\lambda - 8$$

$$-(-8\lambda - 8)$$

$$- \quad -$$

$$-(\lambda^2 - 6\lambda + 8)$$

$$-(\lambda - 4)(\lambda - 2)$$

$$\lambda = \{-1; 2; 4\}$$

$$A \cdot \vec{x} = \lambda \cdot \vec{x}$$

$\lambda = 2$:
$$\begin{pmatrix} 2 & 1 & 2 \\ 2 & 2 & -2 \\ 3 & 1 & 1 \end{pmatrix} \cdot \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = 2 \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix}$$

$$\left| \begin{array}{l} 2x_1 + x_2 + 2x_3 = 2x_1 \\ 2x_1 + 2x_2 - 2x_3 = 2x_2 \\ 3x_1 + x_2 + x_3 = 2x_3 \end{array} \right| \to \left| \begin{array}{l} x_2 + 2x_3 = 0 \\ 2x_1 - 2x_3 = 0 \\ 3x_1 + x_2 - x_3 = 0 \end{array} \right|$$

$$\left.\begin{array}{l} x_2 = -2x_3 \\ x_1 = x_3 \end{array}\right\} \quad \begin{array}{l} 3x_2 - 2x_3 - x_3 = 0 \\ 0 = 0 \end{array}$$

$$x_3 = \beta$$

$$\to \vec{x} = \begin{pmatrix} \beta \\ -2\beta \\ \beta \end{pmatrix}$$