

$$y' + y = \frac{1}{x}$$

$$y(0) = 5$$

$$y(x) \text{ je } \textcircled{y} \text{ } x \in I$$

$$y' = \frac{1}{x} y + \frac{2}{x} u \quad \text{konst.}$$

$$u' = -\frac{3}{x} y - \frac{5}{x} u$$

Ne konst.

$$y' = \frac{x}{x} y + \frac{2 \cos x}{x} u$$

$$u' = (\cos x) y - \frac{7}{x} u$$

Ne lin

$$y' = y \cdot u$$

$$u' = y^2 + \cos u$$

S zadržati

I nemocni

$$\boxed{I' = \beta I \cdot S}$$

$$\boxed{S' = -\beta I S}$$

β konst. \rightarrow snadno se striš

(1d)

$$u(0) = 0$$

$$v(0) = -1$$

$$u' = 2u - 4v$$

$$v' = u - 2v$$

1. Schritt

λ

$$u' \rightarrow \lambda u \quad \lambda^2 v = v''$$

$$v' \rightarrow \lambda v$$

$$(\lambda - 1)u = \lambda u - u = u' - u$$

$$\lambda u = 2u - 4v$$

$$0 = (2 - \lambda)u$$

$$-4v$$

$$\lambda v = 1u - 2v$$

$$0 = 1u$$

$$(-2 - \lambda)v$$

matrix

$$\begin{pmatrix} u & v \\ (2-\lambda) & -4 \\ 1 & (-2-\lambda) \end{pmatrix} \xrightarrow{(\lambda-2)} \sim \begin{matrix} -(\lambda-2)(\lambda+2) \\ -(\lambda-2)(-2-\lambda) \end{matrix}$$

2. Schritt

$$\begin{pmatrix} (2-\lambda) + 1 \cdot (\lambda-2) & -4 + (\lambda-2)(-2-\lambda) \\ 1 & -2-\lambda \end{pmatrix}$$

$$\sim \begin{pmatrix} u & v \\ 0 & -\lambda^2 \\ 1 & -2-\lambda \end{pmatrix}$$

$$\underline{0u + -\lambda^2 v = 0}$$

$$\begin{matrix} 1u & (-2-\lambda)v = 0 \\ & u - 2v - \lambda v = 0 \end{matrix}$$

$$+v'' = 0$$

$$v' = c_1$$

$$\boxed{v = c_1 x + c_2}$$

$$u - 2v - v' = 0$$

$$u = 2v + v'$$

$$\boxed{u = 2c_1 x + 2c_2 + c_1}$$

$$u(0) = 0$$

$$0 = u(0) = 2c_2 + c_1$$

$$\boxed{x \in \mathbb{R}}$$

$$v(0) = -1$$

$$-1 = v(0) = c_2$$

$$\boxed{c_2 = -1}$$

$$\boxed{c_1 = 2}$$

$$x' = 5x + y - z$$

$$y' = -8y + 6z$$

$$z' = 3x - 12y + 7z$$

$$\lambda x = \dots$$

$$\lambda y = \dots$$

$$\lambda z = \dots$$

$$0 = 5x - \lambda x + y - z$$

$$0 = 0 - 8y - \lambda y + 6z$$

$$0 = 3x - 12y + 7z - \lambda z$$

$$\begin{pmatrix} 5-\lambda & 1 & -1 \\ 0 & -8-\lambda & 6 \\ 3 & -12 & 7-\lambda \end{pmatrix}$$

$$\begin{pmatrix} 3(5-\lambda) & 3 & -3 \\ 0 & -8-\lambda & 6 \\ 3 & -12 & 7-\lambda \end{pmatrix}$$

$$\begin{pmatrix} 3(5-\lambda) - 3(5-\lambda) & 3 + 12(5-\lambda) & -3 - (5-\lambda) \\ 0 & -8-\lambda & 6 \\ 3 & -12 & 7-\lambda \end{pmatrix}$$

$$\begin{pmatrix} 0 & 63 - 12\lambda & -3 - 35 + 5\lambda + 7 \\ 0 & -8-\lambda & 6 \\ 3 & -12 & 7-\lambda \end{pmatrix}$$

$$\begin{pmatrix} 0 & 159 & -110 \\ 0 & -8-\lambda & 6 \\ 3 & -12 & 7-\lambda \end{pmatrix}$$