$\lambda = i\omega$

$\lambda = \omega^2 \Rightarrow \omega_{1/2} = 0$ $\quad -0{,}5$

$\omega = \pm\sqrt{-k\left(\frac{1}{m_1}+\frac{1}{m_2}\right)} \Rightarrow \lambda = -k\left(\frac{1}{m_1}+\frac{1}{m_2}\right)$

Einsetzen in $(M-\lambda E)\vec{u}$

$$= \begin{pmatrix} -\frac{k}{m_1}+\frac{k}{m_1}+\frac{k}{m_2} & \frac{k}{m_1} \\ \frac{k}{m_2} & -\frac{k}{m_2}+\frac{k}{m_1}+\frac{k}{m_2} \end{pmatrix}\vec{u} \Rightarrow \omega = \pm\sqrt{k\left(\frac{\wedge}{u_1}+\frac{\wedge}{u_2}\right)}$$

$$= \begin{pmatrix} k/m_2 & k/m_1 \\ k/m_2 & k/m_1 \end{pmatrix}\begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \doteq 0$$

$$u_1\frac{k}{m_2} + u_2\frac{k}{m_1} = 0$$

$$u_1\frac{k}{m_2} + u_2\frac{k}{m_1} = 0$$

$\left(\begin{smallmatrix} -\frac{u_2}{u_1} \\ \wedge \end{smallmatrix}\right)$ EV

$$u_1 = -\frac{m_2}{m_1}u_2 \rightarrow \vec{u} = a\begin{pmatrix} -\frac{m_2}{m_1}u_2 \\ u_2 \end{pmatrix}$$ Eigenvektor (V)

$\lambda = 0$

$$(M-\lambda E)\vec{u} = k\begin{pmatrix} -\frac{1}{m_1} & \frac{1}{m_1} \\ \frac{1}{m_2} & -\frac{1}{m_2} \end{pmatrix}\begin{pmatrix} u_1 \\ u_2 \end{pmatrix} \doteq \vec{0}$$

$$-\frac{k}{m_1}u_1 + \frac{k}{m_1}u_2 = 0 \Leftrightarrow -u_1 + u_2$$

$$\frac{k}{m_2}m + \frac{k}{m_2}u_2 = 0 \Leftrightarrow u_1 = u_2$$

$\Rightarrow \vec{u}_0 = a\begin{pmatrix} u_1 \\ u_2 \end{pmatrix}$ Eigenvektor $\quad \left(\begin{smallmatrix} 1 \\ \wedge \end{smallmatrix}\right)$ EV

4,515