

$$x = \begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$$

$$\ddot{x} + Sx = 0$$

$$S = \underbrace{\begin{pmatrix} 6/5 & -1/5 \\ -1/5 & 6/5 \end{pmatrix}}_{S_0} \cdot \omega_0^2$$

$$\ddot{x} = -S_0 \omega_0^2 x$$

$$M \ddot{x} + Cx = 0$$

$$M = \begin{pmatrix} m_1 & 0 \\ 0 & m_2 \end{pmatrix} \quad C = \begin{pmatrix} c_1 + c_2 & -c_2 \\ -c_2 & c_2 + c_3 \end{pmatrix}$$

$$M \ddot{x} = -Cx \quad | M^{-1}$$

$$M^{-1} M \ddot{x} = -M^{-1} Cx$$

$$\underline{\ddot{x} = -M^{-1} Cx}$$