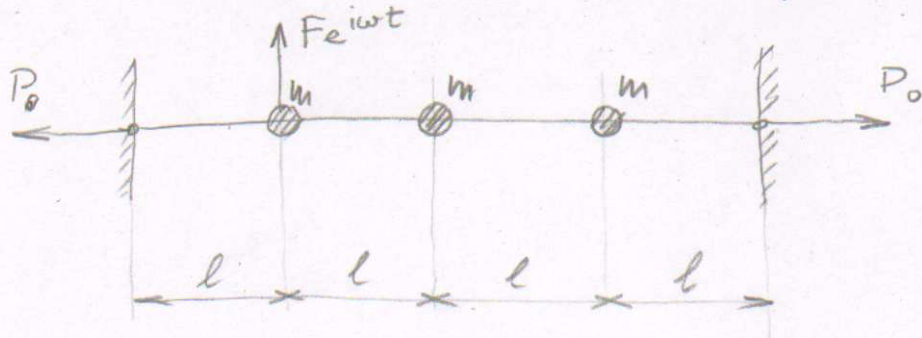


Kmitání struny



Dáno: m, l, P

F_0, ω

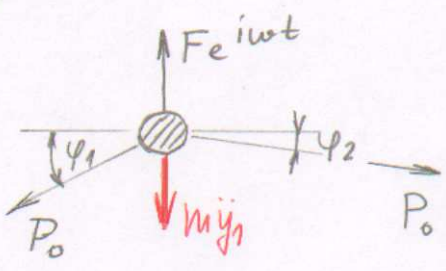
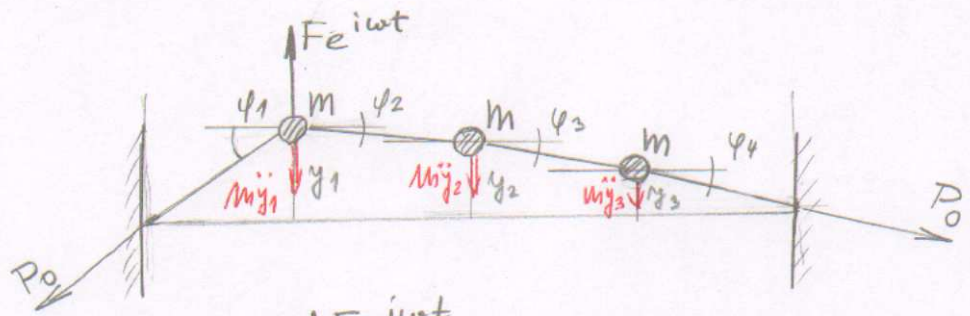
předp. $P_0 \Rightarrow F, y_i \ll l$

$B = \alpha \cdot K$

diskrétní soustava

Určete: společně "zadáni"

Rešení:



Poh. rce: $m \ddot{y}_1 + P_0 \sin \psi_1 + P \sin \psi_2 = F e^{i\omega t}$

$m \ddot{y}_2 - P_0 \sin \psi_2 + P \sin \psi_3 = 0$

$m \ddot{y}_3 - P_0 \sin \psi_3 + P \sin \psi_4 = 0$

$\sin \psi_1 = \tan \psi_1 = \frac{y_1}{l}$

$\sin \psi_2 = \tan \psi_2 = \frac{y_1 - y_2}{l}$

$\sin \psi_3 = \tan \psi_3 = \frac{y_2 - y_3}{l}$

$\sin \psi_4 = \tan \psi_4 = \frac{y_3}{l}$

1. $m \ddot{y}_1 + P \frac{y_1}{l} + P \frac{y_1 - y_2}{l} = F e^{i\omega t}$

$m \ddot{y}_2 - P \frac{y_1 - y_2}{l} + P \frac{y_2 - y_3}{l} = 0$

$m \ddot{y}_3 - P \frac{y_2 - y_3}{l} + P \frac{y_3}{l} = 0$

2.
$$\begin{pmatrix} m & 0 & 0 \\ 0 & m & 0 \\ 0 & 0 & m \end{pmatrix} \begin{pmatrix} \ddot{y}_1 \\ \ddot{y}_2 \\ \ddot{y}_3 \end{pmatrix} + \begin{pmatrix} \frac{2P}{l} & -\frac{P}{l} & 0 \\ -\frac{P}{l} & \frac{2P}{l} & -\frac{P}{l} \\ 0 & -\frac{P}{l} & \frac{2P}{l} \end{pmatrix} \begin{pmatrix} y_1 \\ y_2 \\ y_3 \end{pmatrix} = e^{i\omega t} \begin{pmatrix} F_0 \\ 0 \\ 0 \end{pmatrix}$$

3. - 4. rie PR1, PR2