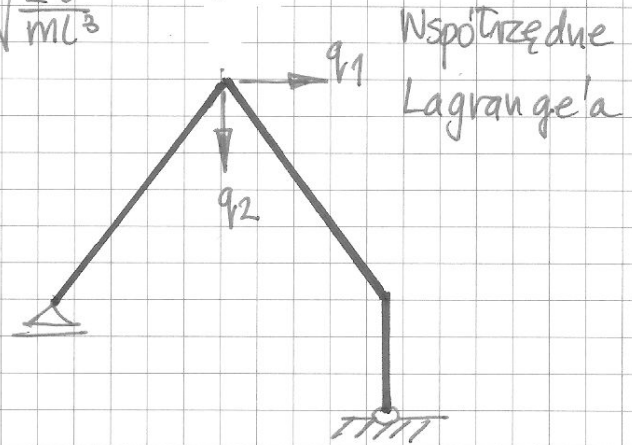
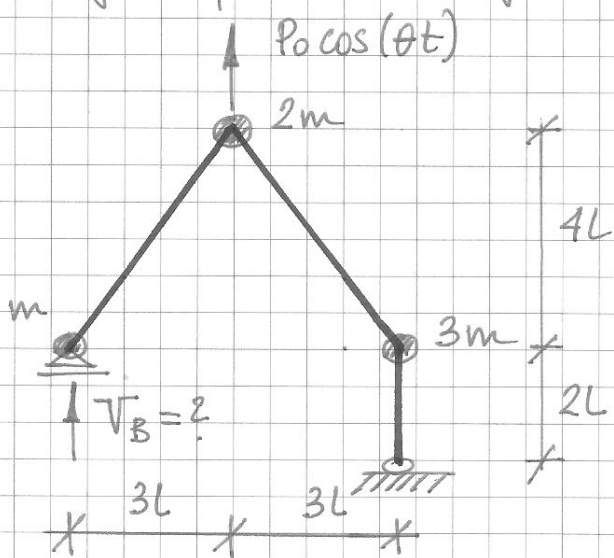
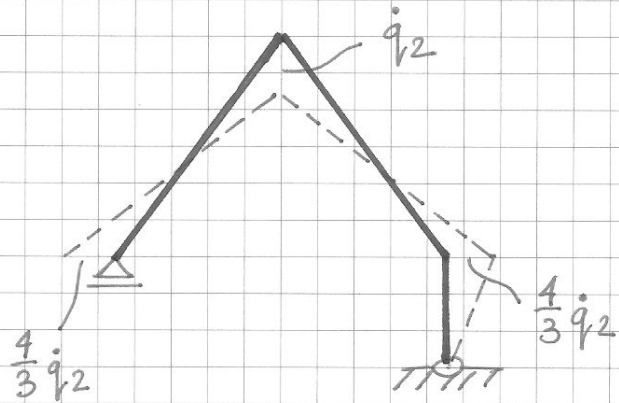
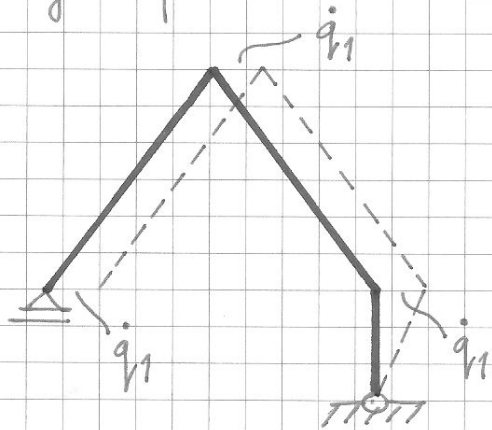


Obliczyć amplitudę reakcji  $V_B$ .  $EJ = \text{const.}$

$$\theta = \sqrt{\frac{EJ}{mL^3}}$$



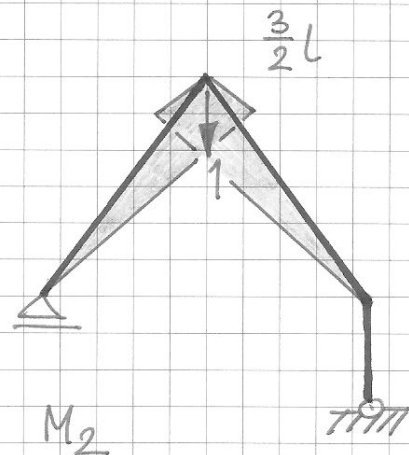
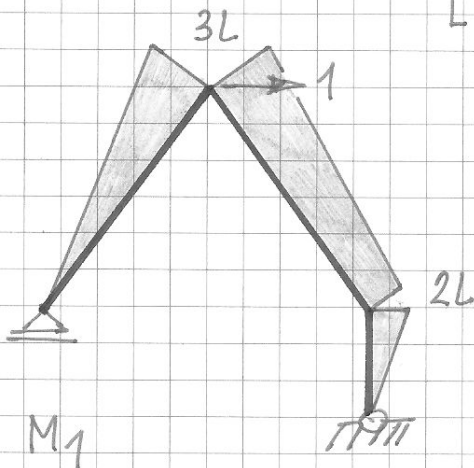
Plany amplitud

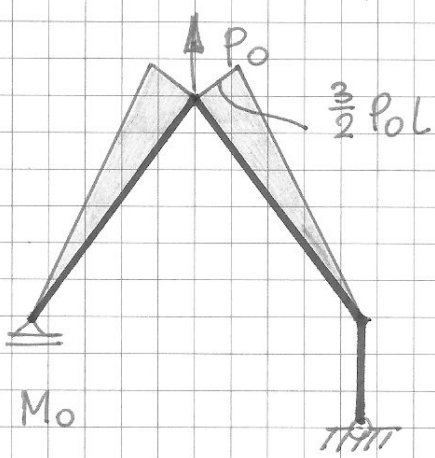


Energia kinetyczna

$$2E_k = m \left( \dot{q}_1 - \frac{4}{3} \dot{q}_2 \right)^2 + 2m \left( \dot{q}_1^2 + \dot{q}_2^2 \right) + 3m \left( \dot{q}_1 + \frac{4}{3} \dot{q}_2 \right)^2 = \dot{q}_L^T M \dot{q}_L$$

$$M = \begin{bmatrix} 6 & \frac{8}{3} \\ \frac{8}{3} & \frac{82}{9} \end{bmatrix} m$$



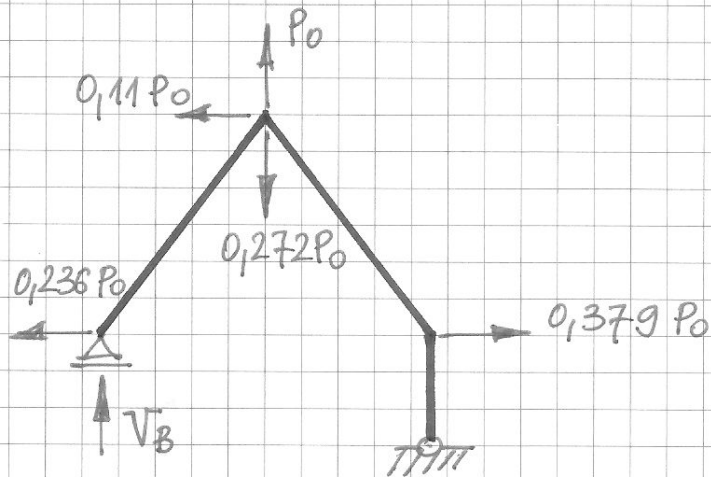


$$D = \begin{bmatrix} 49,33 & -17,5 \\ -17,5 & 7,5 \end{bmatrix} \frac{L^3}{EJ}$$

$$D_0 = \begin{bmatrix} 17,5 \\ -7,5 \end{bmatrix} \frac{P_0 L^3}{EJ}$$

$$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

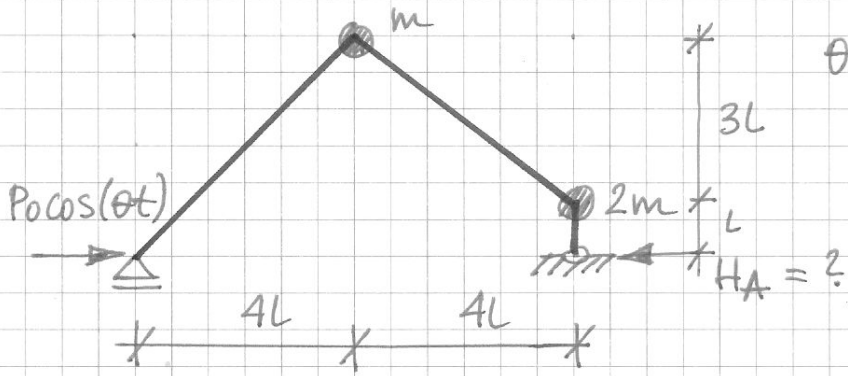
$$(I - \theta^2 D M) q_L = D_0 \Rightarrow q = \begin{bmatrix} -0,055 \\ 0,136 \end{bmatrix} \frac{P_0 L^3}{EJ}$$



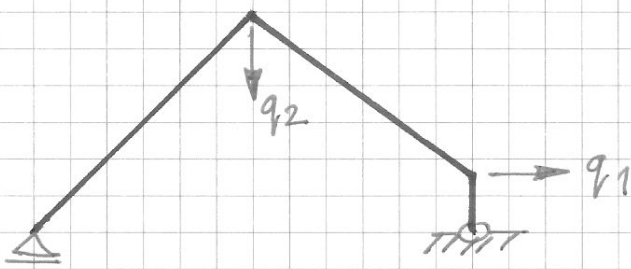
$$V_B = -0,302 P_0$$

Obliczyć amplitudę reakcji  $H_A$ .  $EJ = \text{const.}$

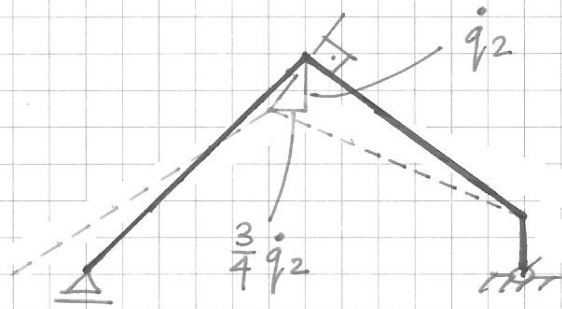
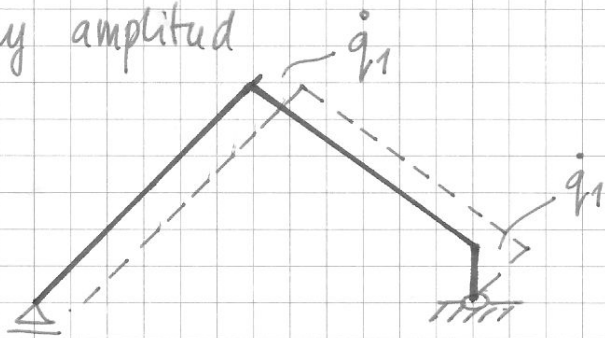
$$\theta = \sqrt{\frac{EJ}{mL^3}}$$



Współrzędne Lagrange'a



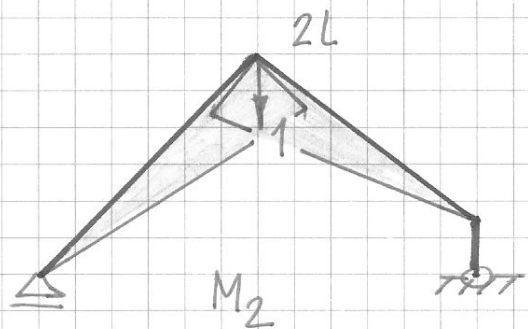
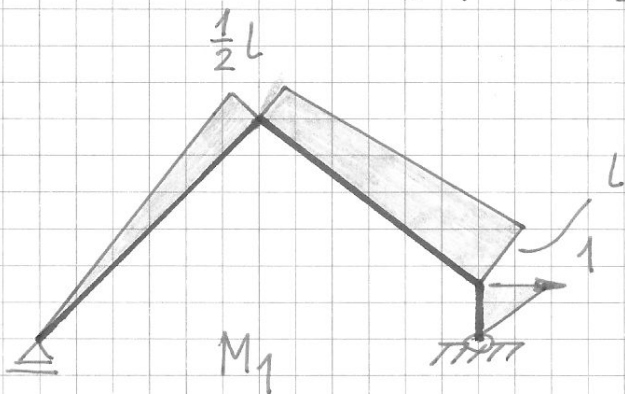
Plany amplitud

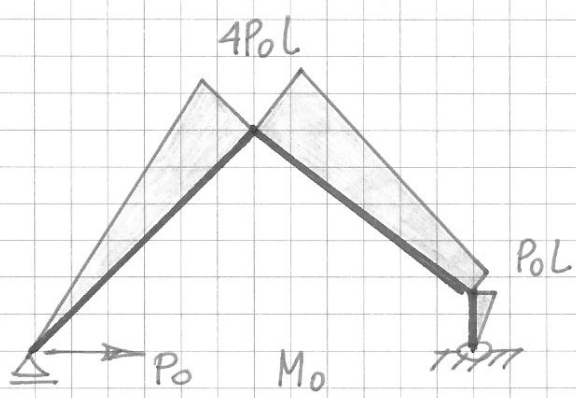


Energia kinetyczna

$$2E_k = m \left[ \left( \dot{q}_1 - \frac{3}{4} \dot{q}_2 \right)^2 + \dot{q}_2^2 \right] + 2m \dot{q}_1^2 = \dot{q}^T M \dot{q}$$

$$M = \begin{bmatrix} 3 & -\frac{3}{4} \\ -\frac{3}{4} & \frac{25}{16} \end{bmatrix} m$$



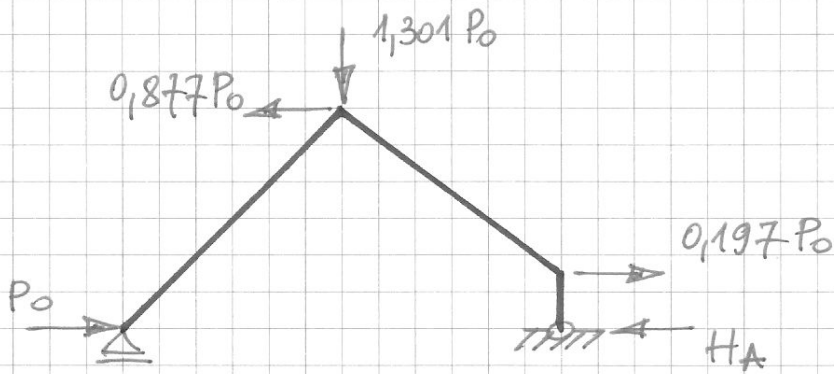


$$D = \begin{bmatrix} 3,721 & -5,219 \\ -5,219 & 14,209 \end{bmatrix} \frac{L^3}{EJ}$$

$$D_0 = \begin{bmatrix} 12,855 \\ -30,085 \end{bmatrix} \frac{P_0 L^3}{EJ}$$

$$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$(I - \theta^2 D I M) q_L = D_0 \Rightarrow q_L = \begin{bmatrix} 0,098 \\ 1,301 \end{bmatrix} \frac{P_0 L^3}{EJ}$$



$$H_A = 0,32 P_0$$