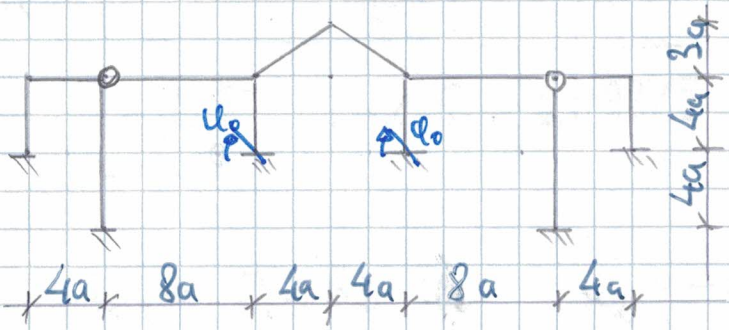
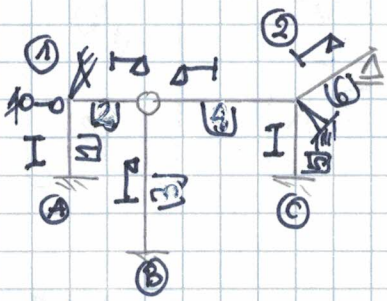
Kolokwium 2.3 r.a. 2025/2026 MK1.

$EJ = const.$ $EA \to \infty$ (M) = ? sch. pod. + UgW





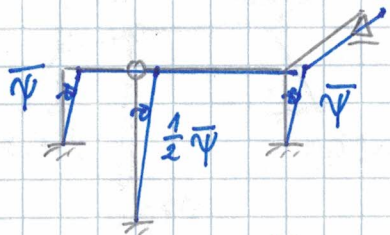
$$q = \begin{bmatrix} u_1 \\ u_2 \\ \psi \end{bmatrix}$$

P.P. $\bar{\psi}^{(1)} = \bar{\psi}^{(5)} = \bar{\psi}$

$\bar{\psi}^{(3)} = \frac{1}{2}\bar{\psi}$

r. r. MP $\quad \Phi_1^{(1)} + \Phi_1^{(2)} = 0 \quad (1)$

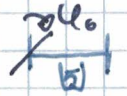
$\Phi_2^{(4)} + \Phi_2^{(5)} + \Phi_2^{(6)} = 0 \quad (2)$



$$\left(\Phi_A^{(1)} + \Phi_1^{(1)}\right)\bar{\psi} + \Phi_B^{(3)}\frac{1}{2}\bar{\psi} + \left(\Phi_C^{(5)} + \Phi_2^{(5)}\right)\bar{\psi} = 0 \quad (3)$$

$\bar{\psi}^{(2)} = \bar{\psi}^{(4)} = \bar{\psi}^{(6)} = 0$

momenty wyjściowe



$$\Phi_C^{05} = \frac{2EJ}{4a}\left[2u_0\right] = \frac{EJ}{a}u_0$$

WT

1) I $\quad \Phi_A^{(1)} = \frac{2EJ}{4a}\left[u_1 - 3\psi\right] = \frac{EJ}{a}\left[\frac{1}{2}u_1 - \frac{3}{2}\psi\right] \cdot (-1)$

$$\Phi_1^{(1)} = \frac{EJ}{a}\left[u_1 - \frac{3}{2}\psi\right]$$

$$\Phi_2^{05} = \frac{1}{2}\frac{EJ}{a}u_0$$

2) ⊢△ $\quad \Phi_1^{(2)} = \frac{3EJ}{4a}\left[u_1\right] = \frac{EJ}{a}\left[\frac{3}{4}u_1\right]$

3) I $\quad \Phi_B^{(3)} = \frac{3EJ}{8a}\left[-\frac{1}{2}\psi\right] = \frac{EJ}{a}\left[-\frac{3}{16}\psi\right] \quad (-\frac{1}{2})$

4) ⊣△ $\quad \Phi_2^{(4)} = \frac{3EJ}{8a}\left[u_2\right] = \frac{EJ}{a}\left[\frac{3}{8}u_2\right]$

5) ⊢△ $\quad \Phi_2^{(6)} = \frac{EJ}{a}\left[\frac{3}{5}u_2\right]$

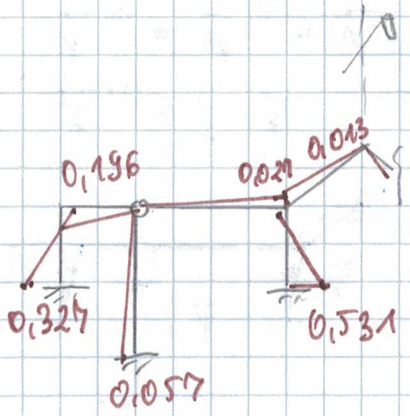
5) I $\quad \Phi_C^{(5)} = \frac{2EJ}{4a}\left[u_2 - 3\psi\right] + \frac{EJ}{a}u_0 = \frac{EJ}{a}\left[\frac{1}{2}u_2 - \frac{3}{2}\psi\right] + \frac{EJ}{a}u_0$

$$\Phi_2^{(5)} = \frac{EJ}{a}\left[u_2 - \frac{3}{2}\psi\right] + \frac{EJ}{a}\left[\frac{1}{2}u_0\right] \quad (-1)$$

Układ r-n MP

$$\frac{EJ}{a}\begin{bmatrix} 1{,}75 & 0 & -1{,}5 \\ 0 & 1{,}975 & -1{,}5 \\ -1{,}5 & -1{,}5 & 6{,}09375 \end{bmatrix}\begin{bmatrix} u_1 \\ u_2 \\ \psi \end{bmatrix} = \begin{bmatrix} 0 \\ -0{,}5 \\ 1{,}5 \end{bmatrix}\frac{EJ}{a}u_0$$

$u_1 = 0{,}262\, u_0 \qquad u_2 = -0{,}021\, u_0 \qquad \psi = 0{,}305\, u_0$



(M) $\left[\frac{EJ}{l}u_0\right]$