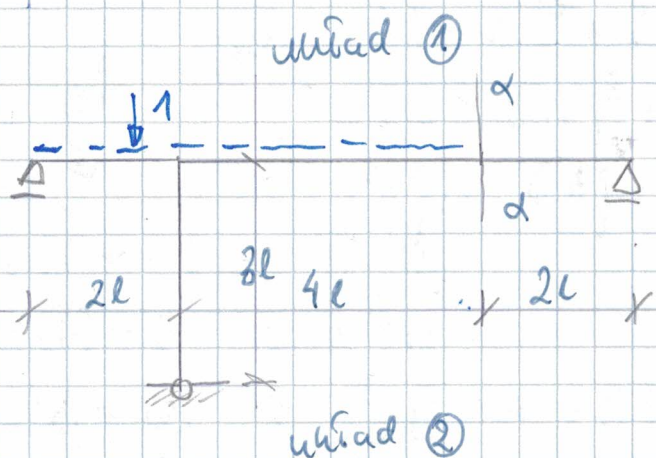


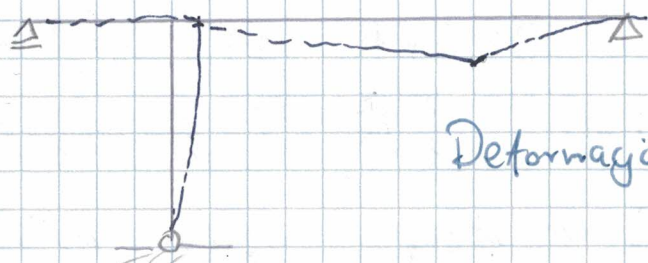


z tw. Bettiego

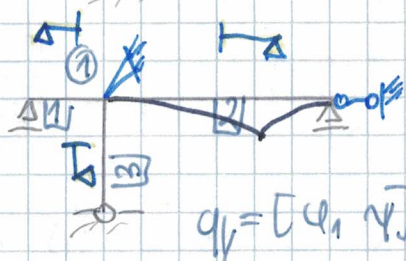
$$L_{12} = 1 \cdot w^{(2)}(y) + M_\alpha(-1)$$

$$L_{21} = 0$$

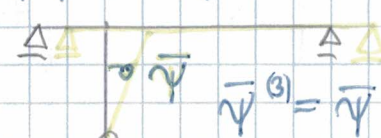
$$M_\alpha(y) = w^{(2)}(y)$$



Deformacja układu ② - MP



p.p. $\bar{\psi}^{(1)} = 0$ $\bar{\psi}^{(2)} = 0$



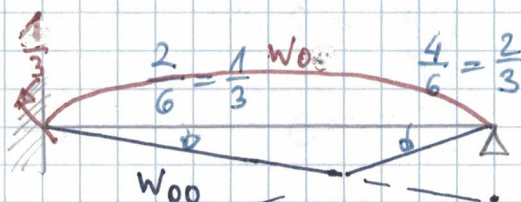
r.r. MP

$$\Phi_1^{(1)} + \Phi_1^{(2)} + \Phi_1^{(3)} = 0 \quad (1)$$

$$\Phi_1^{(3)} \bar{\psi} = 0$$

momenty wywołane w przecie nr 2

$$\Phi_1^{(2)} = \frac{3EI}{6l} \left[-\frac{1}{2} \right] = -\frac{1}{6} \frac{EI}{l}$$



$$w_{00}(x) = \begin{cases} \frac{1}{3}x, & x \leq 4l \\ \frac{2}{3}(6l-x), & x > 4l \end{cases}$$

WT

$$1) \quad \Phi_1^{(1)} = \frac{3EI}{2l} [\psi_1]$$

$$2) \quad \Phi_1^{(2)} = \frac{3EI}{6l} [\psi_1] - \frac{1}{6} \frac{EI}{l} = \frac{1}{2} \frac{EI}{l} [\psi_1] - \frac{1}{6} \frac{EI}{l}$$

$$3) \quad \Phi_1^{(3)} = \frac{3EI}{2l} [\psi_1 - \bar{\psi}]$$

$$\frac{EI}{l} \begin{bmatrix} 3 & -1 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} \psi_1 \\ \bar{\psi} \end{bmatrix} = \begin{bmatrix} \frac{1}{6} \\ 0 \end{bmatrix} \frac{EI}{l} \quad \begin{aligned} \psi_1 &= \frac{1}{12} \\ \bar{\psi} &= \frac{1}{12} \end{aligned}$$

Linia ugięcia prosta nr 1 $\xi = \frac{x}{2l}$



$$w(\xi) = A\xi^3 + B\xi^2 + C\xi + D$$

$$w'(\xi) = 3A\xi^2 + 2B\xi + C$$

$$w''(\xi) = 6A\xi + 2B$$

$$w(0) = 0 \Rightarrow D = 0$$

$$M(0) = 0 \Rightarrow B = 0$$

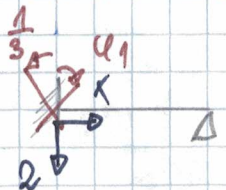
$$\frac{1}{2l}w'(1) = Q_1 \Rightarrow \frac{1}{2l}[3A + C] = \frac{1}{12} \quad A = \frac{l}{12}$$

$$\Rightarrow C = -\frac{l}{12}$$

$$w(1) = 0 \Rightarrow A + C = 0$$

$$w(\xi) = \frac{l}{12}\xi^3 - \frac{l}{12}\xi \quad M_x(\eta) = w(\eta) \quad \eta = \frac{4}{3}l$$

Linia ugięcia prosta nr 2 $\xi = \frac{x}{6l}$



$$\tilde{w}(\xi) = A\xi^3 + B\xi^2 + C\xi + D$$

$$\tilde{w}(0) = 0 \Rightarrow D = 0$$

$$\tilde{w}'(0) = \frac{1}{12} - \frac{1}{3} \Rightarrow \frac{1}{6l}[C] = -\frac{1}{4}$$

$$A = -\frac{3}{4}l$$

$$\tilde{w}(1) = 0 \Rightarrow A + B + C = 0$$

$$\Rightarrow B = \frac{9}{4}l$$

$$\tilde{M}(1) = 0 \Rightarrow -\frac{Eq}{(6l)^3}[6A + 2B] = 0$$

$$C = -\frac{3}{2}l$$

$$\tilde{w}(\xi) = -\frac{3}{4}l\xi^3 + \frac{9}{4}l\xi^2 - \frac{3}{2}l\xi$$

$$w_{00}(\xi) = \begin{cases} 2l\xi, & x \leq \frac{2}{3} \\ 4l(1-\xi), & x > \frac{2}{3} \end{cases}$$

$$w(\xi) = w_{00}(\xi) + \tilde{w}(\xi)$$

$$\eta = \frac{4}{6l}$$

$$M_x(\eta) = w(\eta)$$