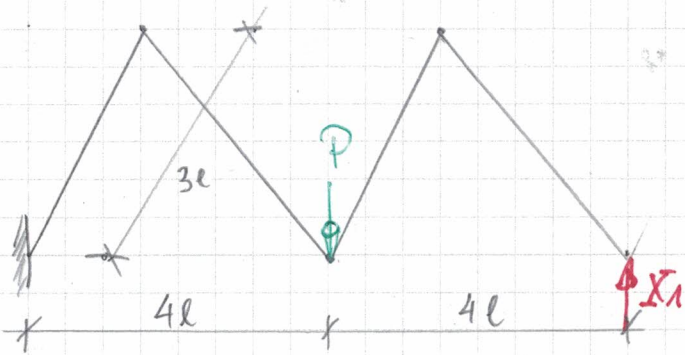


USW



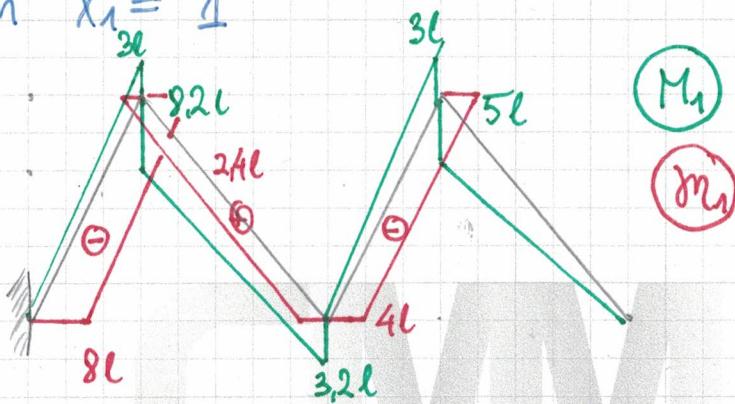
$$E\gamma = \text{const.}$$

$$\gamma\gamma_s = 0,5 E\gamma$$

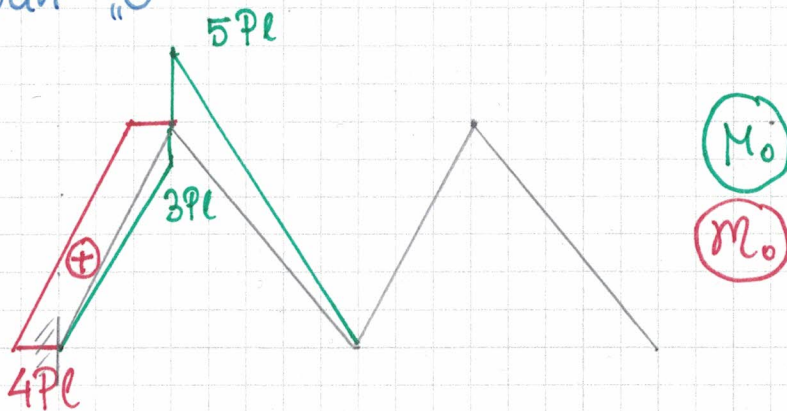
$$\delta_{11} X_1 + \delta_{10} = 0$$

$$X_1 = -\frac{\delta_{10}}{\delta_{11}}$$

Stan $X_1 = 1$



Stan "0"

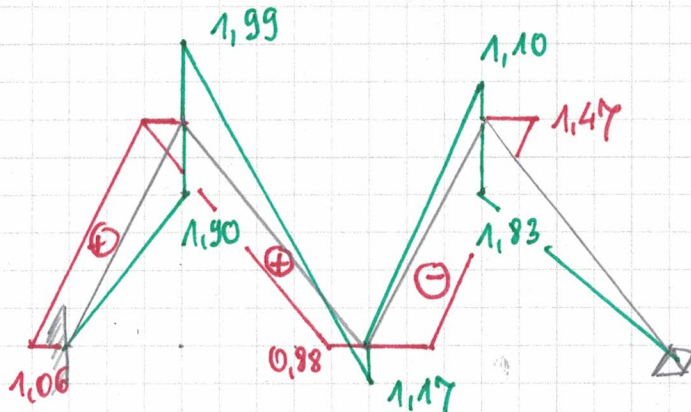


$$\begin{aligned} \delta_{11} &= \frac{1}{E\gamma} \left[\frac{1}{2} \cdot 5l \cdot 5l \cdot \frac{2}{3} 5l + \frac{1}{2} \cdot 3l \cdot 3l \cdot \frac{2}{3} 3l \cdot 2 + \right. \\ &+ \frac{1}{2} 3,2l \cdot 5l \left(\frac{2}{3} 3,2l + \frac{1}{3} 8,2l \right) + \frac{1}{2} 8,2l \cdot 5l \left(\frac{2}{3} 8,2l + \frac{1}{3} 3,2l \right) \left. \right] \\ &+ \frac{2}{E\gamma} \left[4l \cdot 3l \cdot 4l + 2,4l \cdot 5l \cdot 2,4l + 8l \cdot 3l \cdot 8l \right] = \\ &= 770,13 \frac{l^3}{E\gamma} \end{aligned}$$

$$\delta_{10} = \frac{1}{EY} \left[\frac{1}{2} 5Pl \cdot 5l \left(-\frac{2}{3} 8,2l - \frac{1}{3} 3,2l \right) + \frac{1}{2} 3Pl \cdot 3l \left(-\frac{2}{3} 3l \right) \right] + \frac{2}{EY} \left[4Pl \cdot 3l \left(-8l \right) \right] = -282,67 \frac{Pl^3}{EY}$$

$$X_1 = -\frac{\delta_{10}}{\delta_{11}} = 0,367 P$$

Wykres (M) : (m)

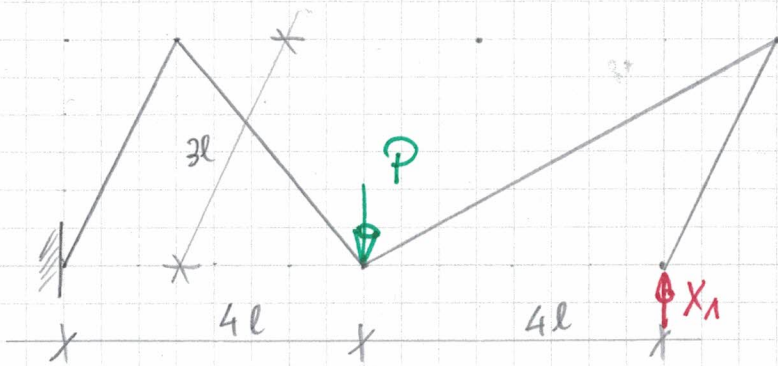


(M) [Pl]

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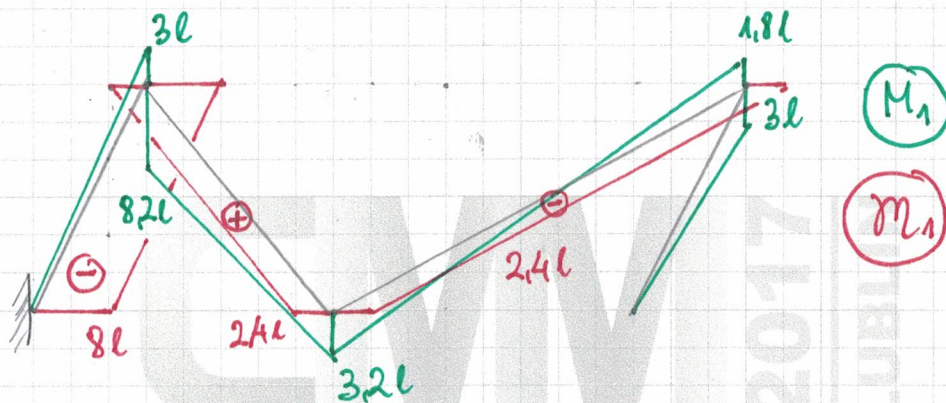
$$EY = \text{const.}$$

$$IY_3 = 0,5 EY$$

$$\delta_{11} X_1 + \delta_{10} = 0$$

$$X_1 = - \frac{\delta_{10}}{\delta_{11}}$$

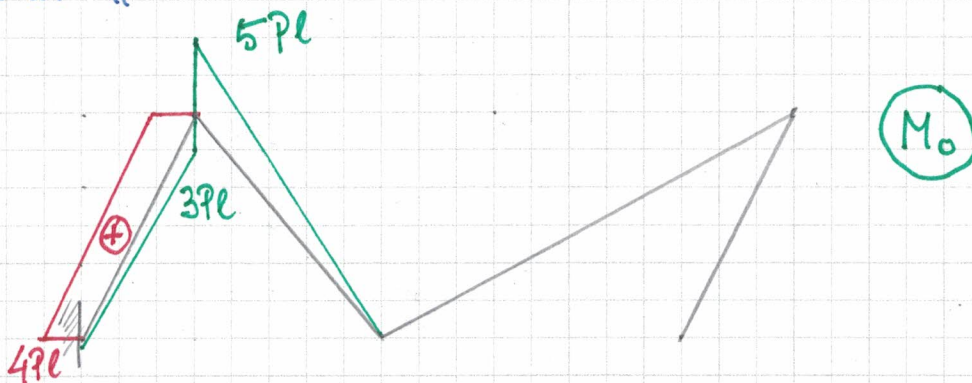
Stan $X_1 = 1$



M_1

M_2

Stan "0"



M_0

$$\begin{aligned} \delta_{11} = \frac{1}{EY} & \left[2 \cdot \frac{1}{2} \cdot 3l \cdot 3l \cdot \frac{2}{3} \cdot 3l + \frac{1}{2} \cdot 1,8l \cdot 5l \left(\frac{2}{3} \cdot 1,8l - \frac{1}{3} \cdot 3,2l \right) + \right. \\ & + \frac{1}{2} \cdot 3,2l \cdot 5l \left(\frac{2}{3} \cdot 3,2l - \frac{1}{3} \cdot 1,8l \right) + \frac{1}{2} \cdot 3,2l \cdot 5l \left(\frac{2}{3} \cdot 3,2l + \frac{1}{3} \cdot 8,2l \right) \\ & + \frac{1}{2} \cdot 8,2l \cdot 5l \left(\frac{2}{3} \cdot 8,2l + \frac{1}{3} \cdot 3,2l \right) \left. \right] + \frac{2}{EY} \left[2,4l \cdot 5l \cdot 2 + \right. \\ & + 8l \cdot 3l \cdot 8l \left. \right] = 702,93 \frac{l^3}{EY} \end{aligned}$$

$$\delta_{10} = \frac{1}{EI} \left[\frac{1}{2} 5Pl \cdot 5l \cdot \left(\frac{2}{3} 8,2l - \frac{1}{3} 3,2l \right) + \frac{1}{2} 3Pl \cdot 3l \cdot \left(-\frac{2}{3} 3l \right) \right] + \frac{2}{EI} \left[4Pl \cdot 3l \cdot (-8l) \right] = -282,67 \frac{Pl^3}{EI}$$

$$X_1 = - \frac{\delta_{10}}{\delta_{11}} = 0,402 P$$

Wykres (M) i (m)

