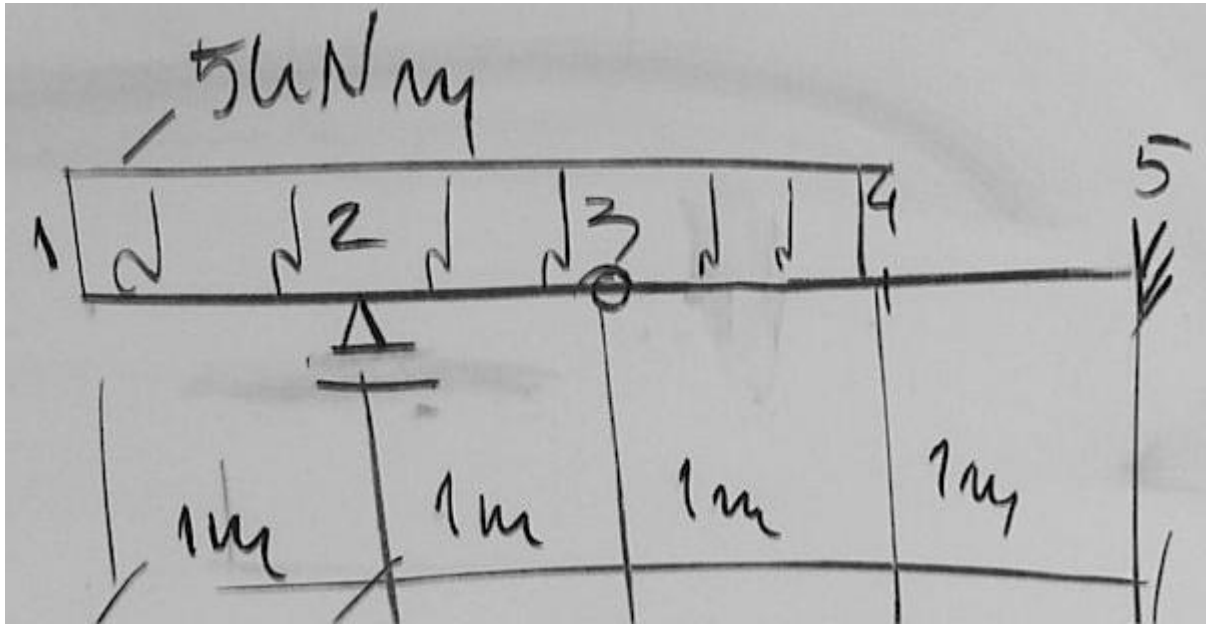
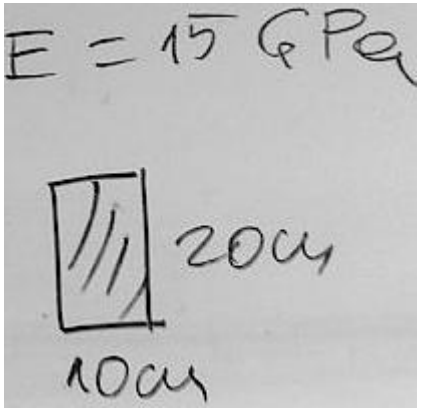
ORIGIN := 0





$q := 5\frac{kN}{m}$ $P := 0kN$

$L := 4m$ $b := 10cm$ $h := 20cm$ $J := b \cdot \frac{h^3}{12}$ $E := 15GPa$ $J = 6666.667 \cdot cm^4$

$R2 := \frac{q \cdot 2m \cdot 1m}{1m}$ $T3 := 0$ $R5 := T3 + q \cdot 1m$ $M5 := T3 \cdot 2m + q \cdot 1m \cdot 1.5m$

$R2 = 10 \cdot kN$ $T3 = 0 \cdot kN$ $R5 = 5 \cdot kN$ $M5 = 7.5 \cdot kN \cdot m$

$n := 4$ $\Delta := \frac{L}{n} = 1\,m$ $\alpha := \frac{\Delta^2}{E \cdot J}$ $\alpha = 1 \cdot \frac{1}{MN}$

$$M1(x) := -q \cdot \frac{x^2}{2}$$

$$M2(x) := M1(x) + R2 \cdot (x - 1m)$$

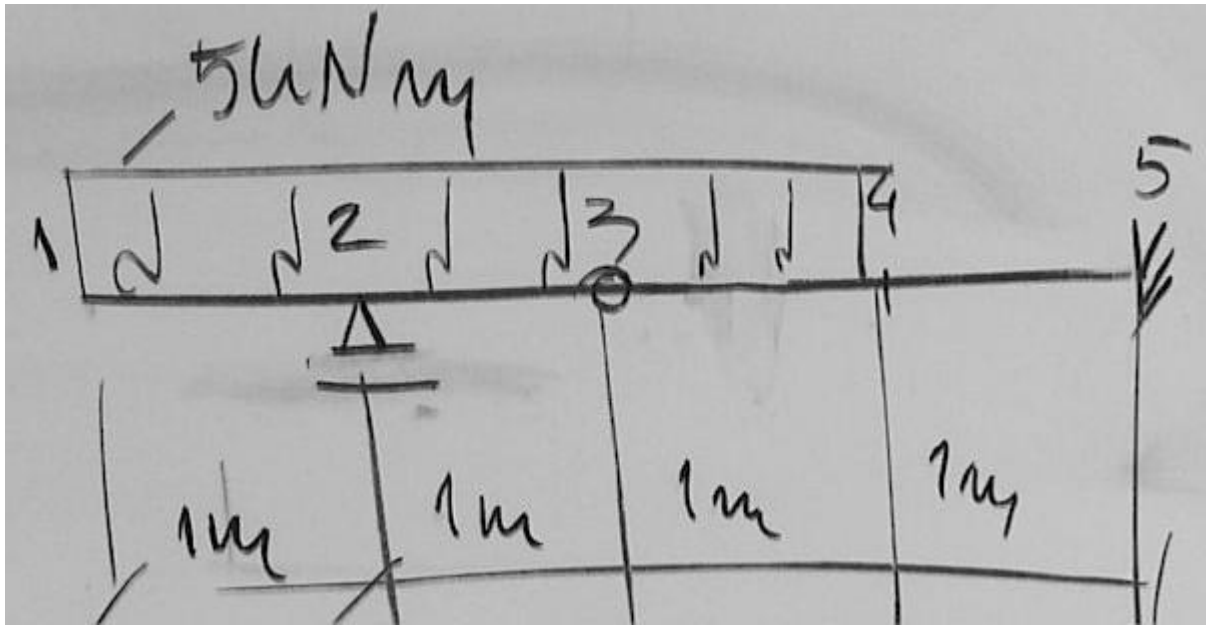
$$M3(x) := -M5 + R5 \cdot (L - x)$$

$i := 0 .. \quad n \qquad X_i := i \cdot \Delta$

$i := 0 .. \quad 1 \qquad M_i := M1(X_i)$

$i := 2 .. \quad 3 \qquad M_i := M2(X_i)$

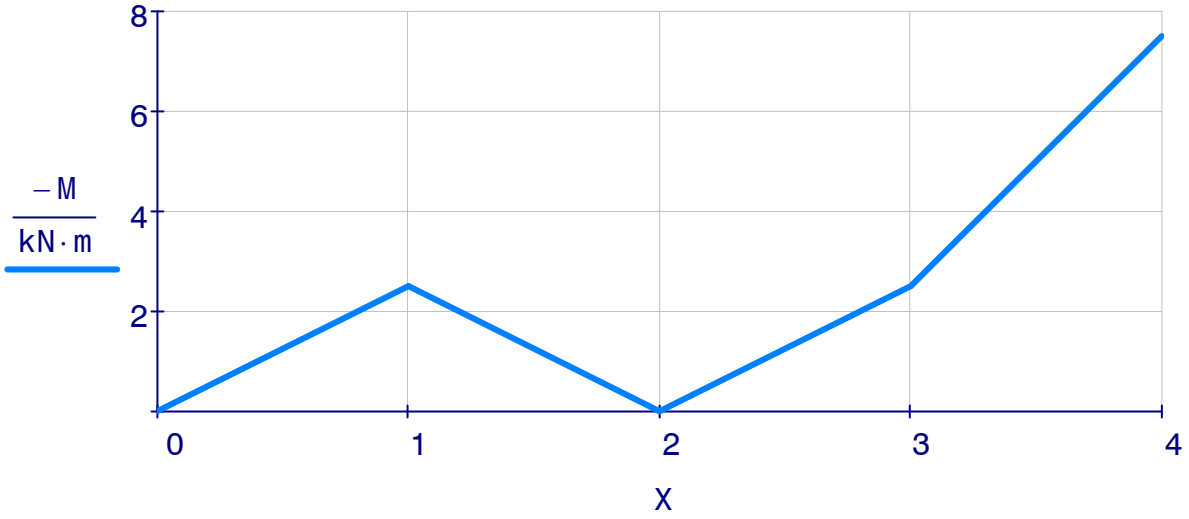
$M_n := -M5$



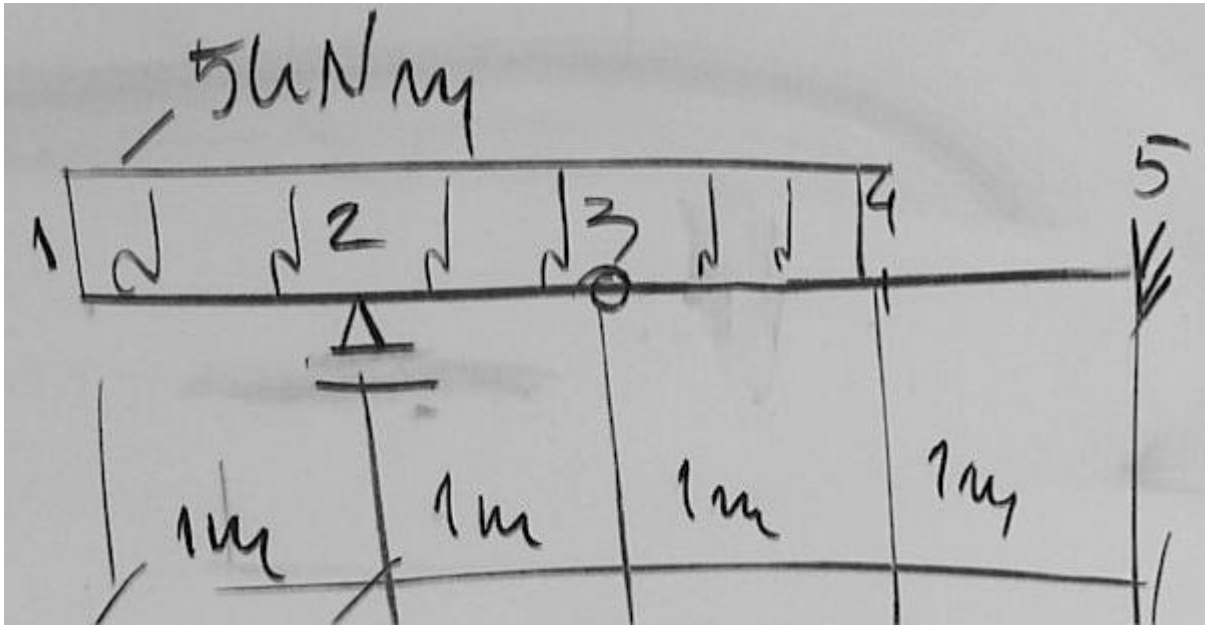
Układ równań metody róznic skończonych

$$A \cdot y = \alpha \cdot M$$

$$M = \begin{array}{|c|c|}\hline & 0 \\ \hline 0 & 0 \\ 1 & -2.5 \\ 2 & 0 \\ 3 & -2.5 \\ 4 & -7.5 \\ \hline \end{array} \cdot kN \cdot m \qquad X = \begin{array}{|c|c|}\hline & 0 \\ \hline 0 & 0 \\ 1 & 1 \\ 2 & 2 \\ 3 & 3 \\ 4 & 4 \\ \hline \end{array} m$$



$$A := \begin{pmatrix} 0 & 1 & 0 & 0 & 0 \\ 1 & -2 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 2 & 0 \end{pmatrix}$$



$y := \mathrm{lsolve}(A, \alpha \cdot M)$

$$y = \begin{pmatrix} 7.5 \\ 0 \\ -10 \\ -3.75 \\ 0 \end{pmatrix} \cdot mm$$