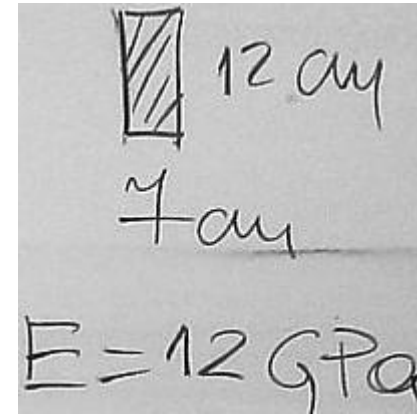
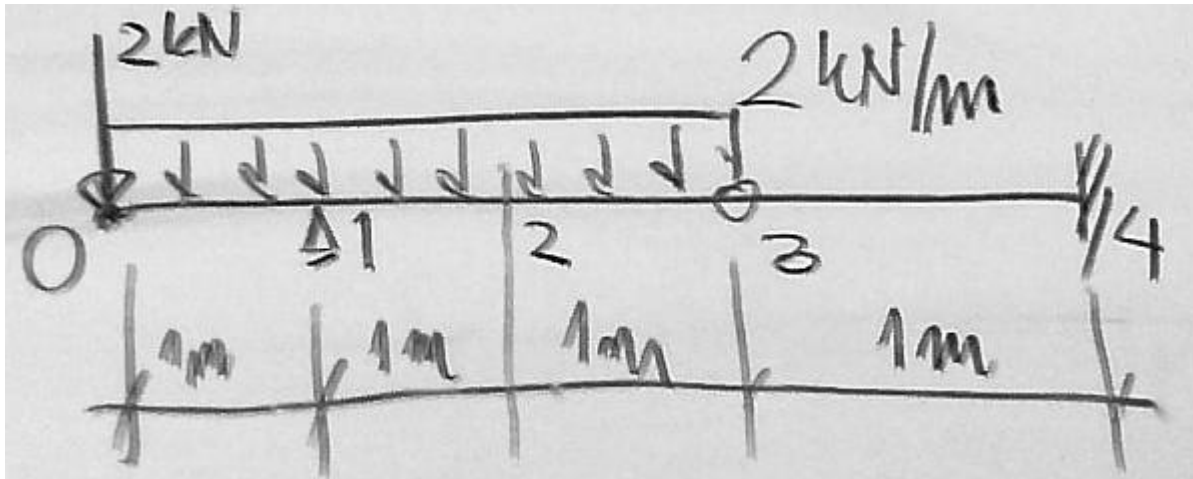


ORIGIN := 0



$$q := 2 \frac{\text{kN}}{\text{m}} \quad P := 2 \text{ kN}$$

$$\underline{L} := 4 \text{ m} \quad b := 7 \text{ cm} \quad h := 12 \text{ cm} \quad \underline{J} := b \cdot \frac{h^3}{12} \quad E := 12 \text{ GPa} \quad J = 1008 \text{ cm}^4$$

$$R1 := \frac{q \cdot 3 \text{ m} \cdot 1.5 \text{ m} + P \cdot 3 \text{ m}}{2 \text{ m}}$$

$$T3 := q \cdot 3 \text{ m} + P - R1$$

$$R0 := T3$$

$$M0 := T3 \cdot 1 \text{ m}$$

$$R1 = 7.5 \text{ kN}$$

$$T3 = 0.5 \text{ kN}$$

$$R0 = 0.5 \cdot \text{kN}$$

$$M0 = 0.5 \cdot \text{kN} \cdot \text{m}$$

$$n := 4 \quad \Delta := \frac{L}{n} = 1 \text{ m}$$

$$\alpha := \frac{\Delta^2}{E \cdot J}$$

$$\alpha = 8.267196 \cdot \frac{1}{\text{MN}}$$

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

$$M2(x) := M1(x) + R1 \cdot (x - 1\text{m})$$

$$M3(x) := M2(x) + q \cdot \frac{(x - 3\text{m})^2}{2}$$

$$i := 0 \ldots n \qquad X_i := i \cdot \Delta$$

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

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

$$i := 3 \ldots n \qquad M_i := M3(X_i)$$

	0
0	0
1	-3
2	-0.5
3	0
4	-0.5

· kN · m

	0
0	0
1	1
2	2
3	3
4	4

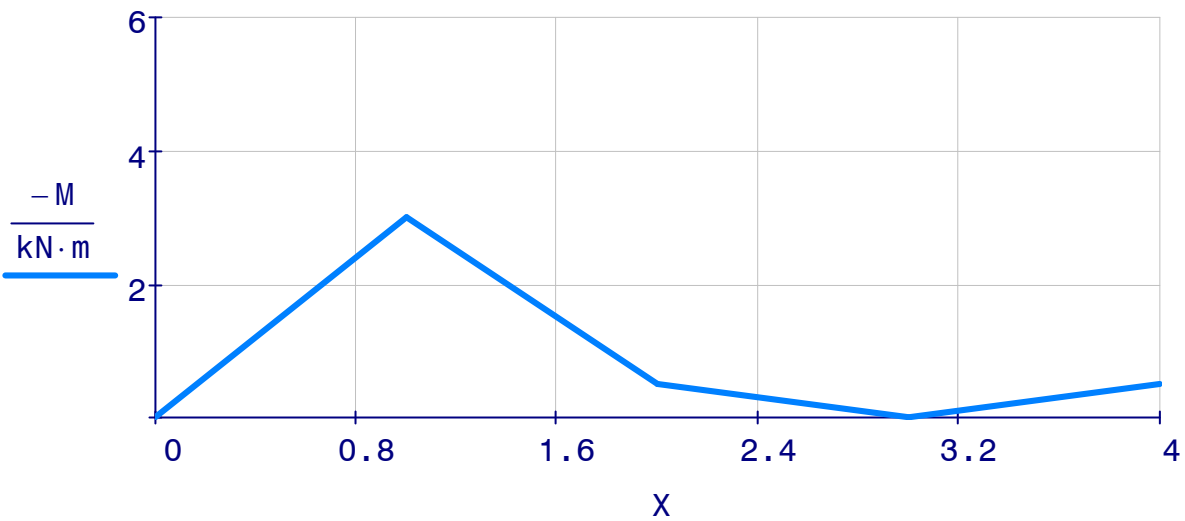
m

M =

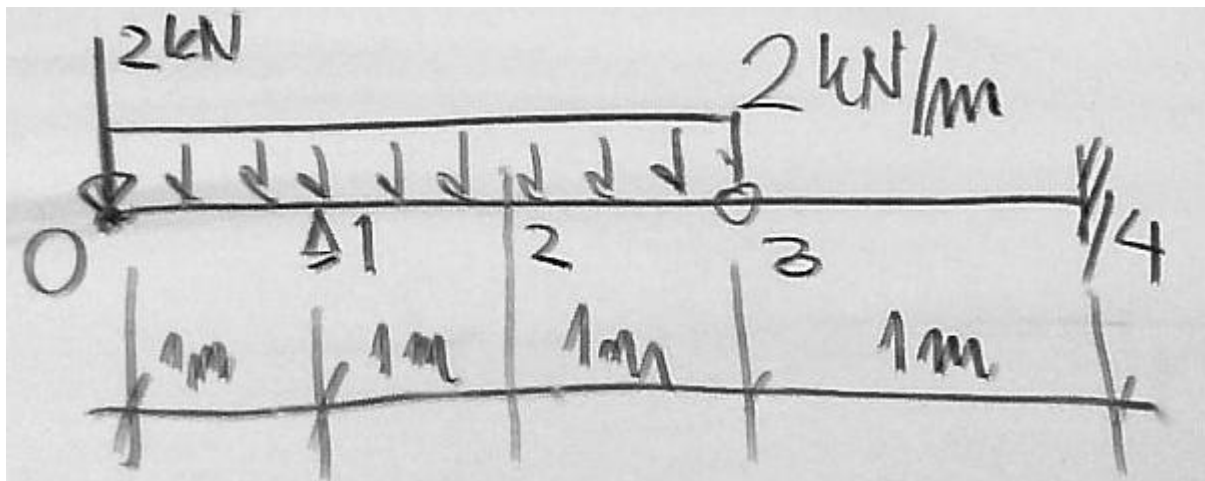
X =

Układ równań metody różnic skończonych

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



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



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

$$y = \begin{pmatrix} -25.835 \\ 0 \\ 1.033 \\ -2.067 \\ 0 \end{pmatrix} \cdot \text{mm}$$

