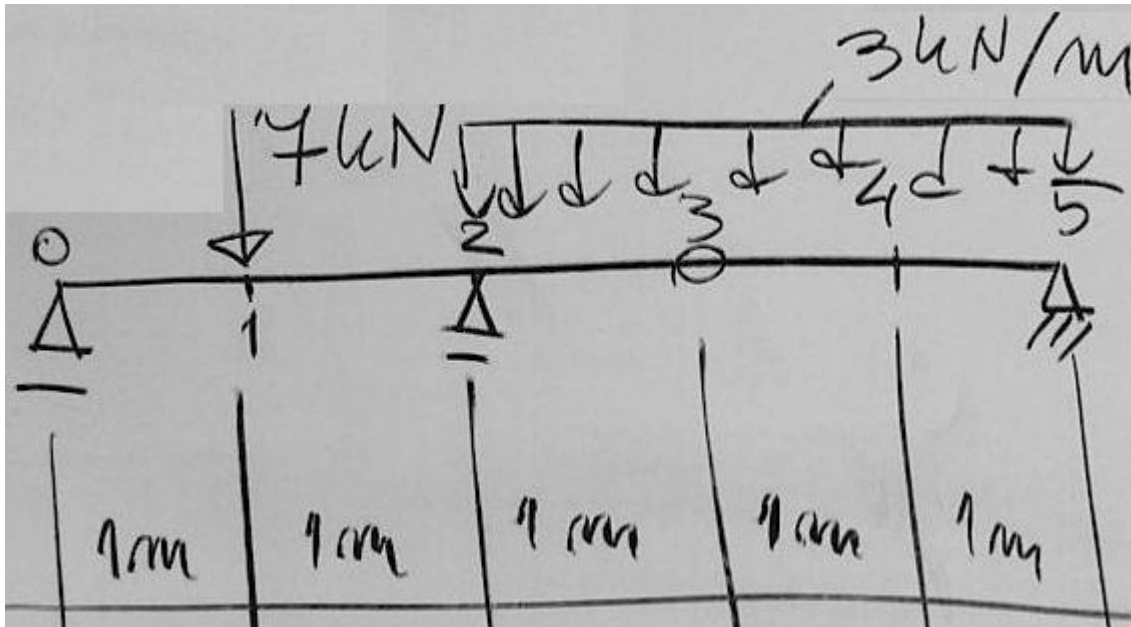


ORIGIN := 0



$$q := 3 \frac{\text{kN}}{\text{m}} \quad P := 7 \text{ kN}$$

$$\underline{L} := 5 \text{ m} \quad b := 12 \text{ cm} \quad h := 14 \text{ cm} \quad \underline{J} := b \cdot \frac{h^3}{12} \quad E := 15 \text{ GPa}$$

$$R5 := \frac{q \cdot 2 \text{ m} \cdot 1 \text{ m}}{2 \text{ m}}$$

$$T3 := q \cdot 2 \text{ m} - R5$$

$$R2 := \frac{q \cdot 1 \text{ m} \cdot 2.5 \text{ m} + P \cdot 1 \text{ m} + T3 \cdot 3 \text{ m}}{2 \text{ m}}$$

$$R0 := q \cdot 3 \text{ m} + P - R2 - R5$$

$$T3 = 3 \cdot \text{kN}$$

$$R0 = 1.25 \cdot \text{kN}$$

$$R2 = 11.75 \cdot \text{kN}$$

$$R5 = 3 \text{ kN}$$

$$n := 5 \quad \Delta := \frac{L}{n} = 1 \text{ m}$$

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

$$\alpha = 2.43 \times 10^{-3} \cdot \frac{1}{\text{kN}}$$

$$M1(x) := R0 \cdot x$$

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

$$M3(x) := M2(x) + R2 \cdot (x - 2m) - q \cdot \frac{(x - 2m)^2}{2}$$

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

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

$$i := 1 \ldots 2 \qquad M_i := M2(X_i)$$

$$i := 2 \ldots n \qquad M_i := M3(X_i)$$

M =

	0
0	0
1	1.25
2	-4.5
3	0
4	1.5
5	0

· kN · m

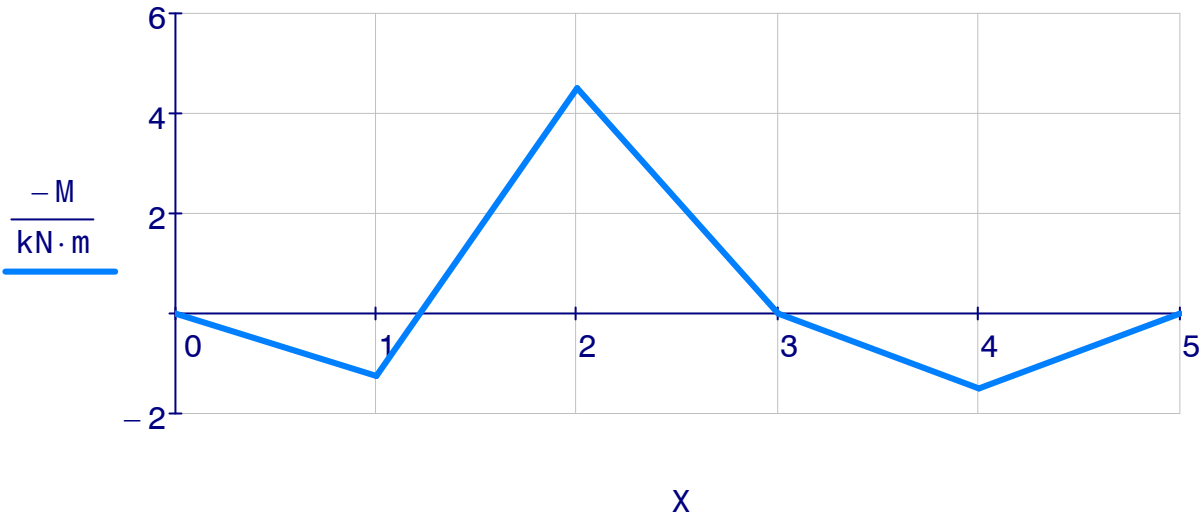
X =

	0
0	0
1	1
2	2
3	3
4	4
5	5

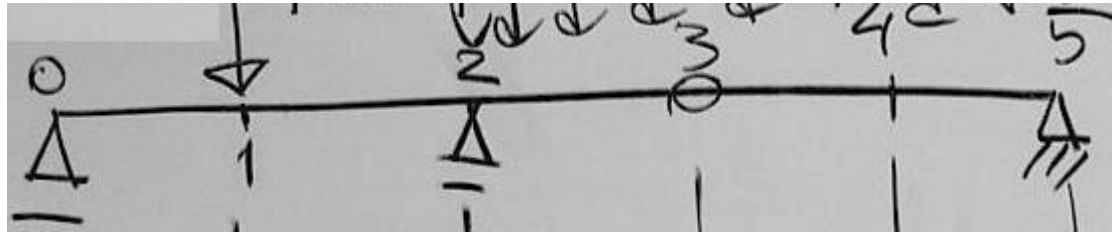
m

Układ równań metody różnic skończonych

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



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



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

$$y = \begin{pmatrix} 0 \\ -1.518 \\ 0 \\ -9.414 \\ -6.529 \\ 0 \end{pmatrix} \cdot \text{mm}$$

