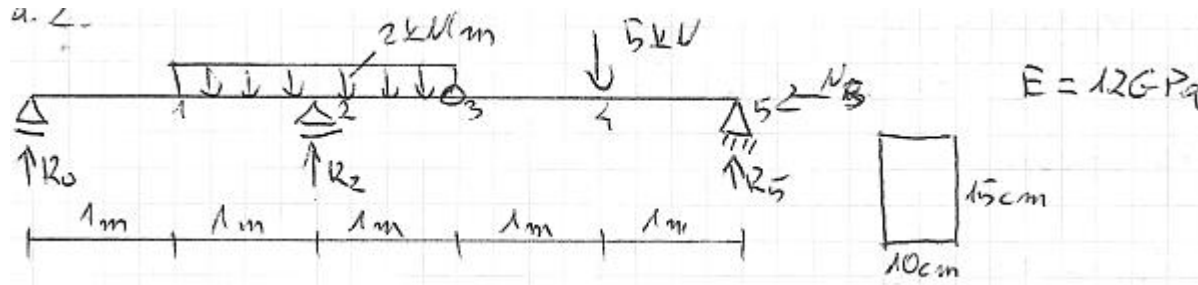


ORIGIN := 0



$$q := 2 \frac{\text{kN}}{\text{m}} \quad P := 5 \text{ kN}$$

$$\underline{L} := 5 \text{ m} \quad b := 10 \text{ cm} \quad h := 15 \text{ cm} \quad \underline{J} := b \cdot \frac{h^3}{12} \quad E := 12 \text{ GPa}$$

$$R5 := \frac{P \cdot 1 \text{ m}}{2 \text{ m}} \quad T3 := P - R5 \quad R2 := \frac{q \cdot 2 \text{ m} \cdot 2 \text{ m} + T3 \cdot 3 \text{ m}}{2 \text{ m}} \quad R0 := q \cdot 2 \text{ m} + T3 - R2$$

$$R5 = 2.5 \text{ kN} \quad T3 = 2.5 \cdot \text{kN} \quad R2 = 7.75 \cdot \text{kN} \quad R0 = -1.25 \cdot \text{kN}$$

$$n := 5 \quad \Delta := \frac{L}{n} = 1 \text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 2.963 \times 10^{-3} \cdot \frac{1}{\text{kN}}$$

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

$$M2(x) := M1(x) - q \cdot \frac{(x - 1\text{m})^2}{2}$$

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

$$M4(x) := R5 \cdot (L - x)$$

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

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

$$i := 2 \ldots 3 \qquad M_i := M3(X_i)$$

$$i := 4 \ldots n \qquad M_i := M4(X_i)$$

M =

	0
0	0
1	-1.25
2	-3.5
3	0
4	2.5
5	0

· kN · m

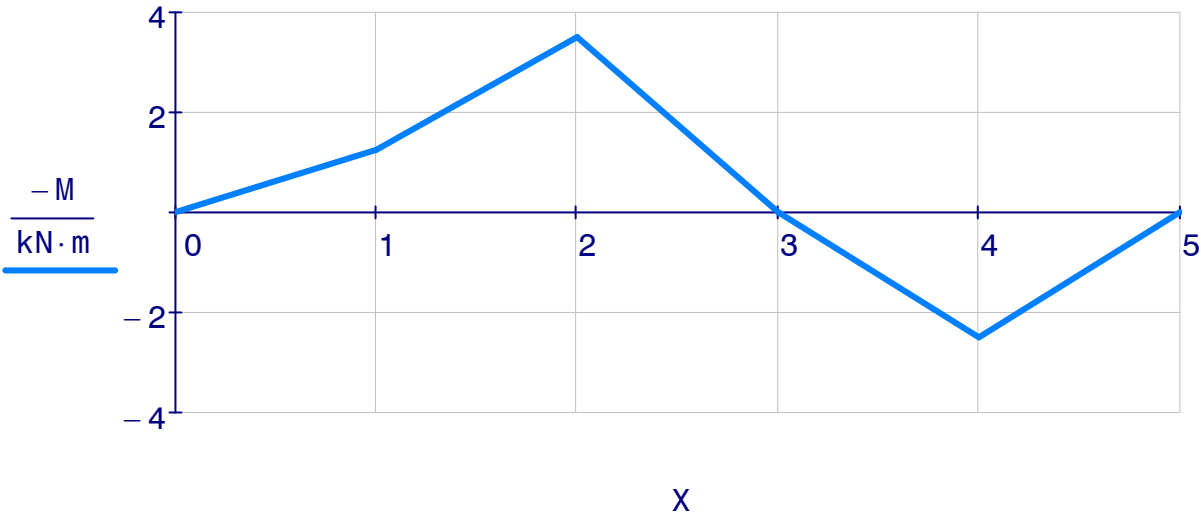
X =

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

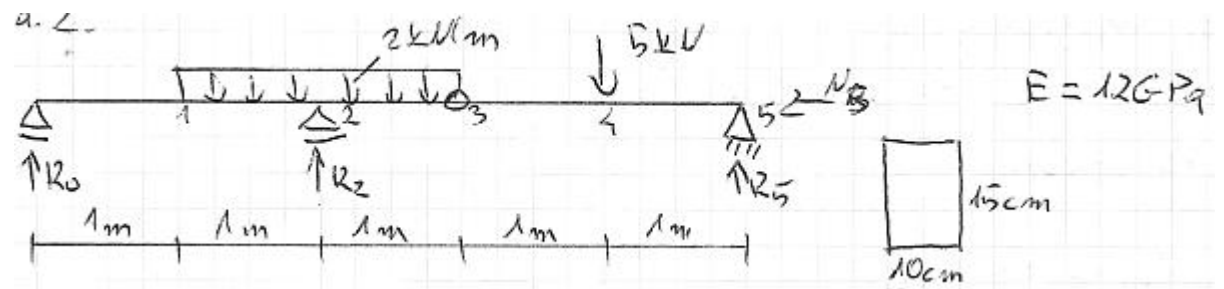
m

Układ równań metody różnic skończonych

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



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



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

$$y = \begin{pmatrix} 0 \\ 1.852 \\ 0 \\ -12.222 \\ -9.815 \\ 0 \end{pmatrix} \cdot \text{mm}$$

