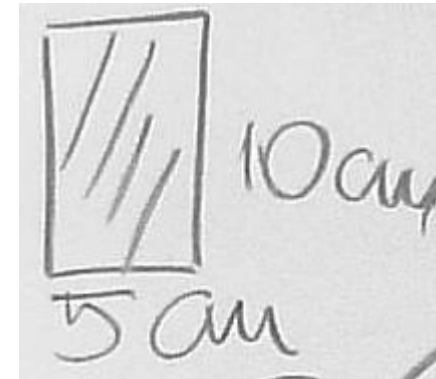
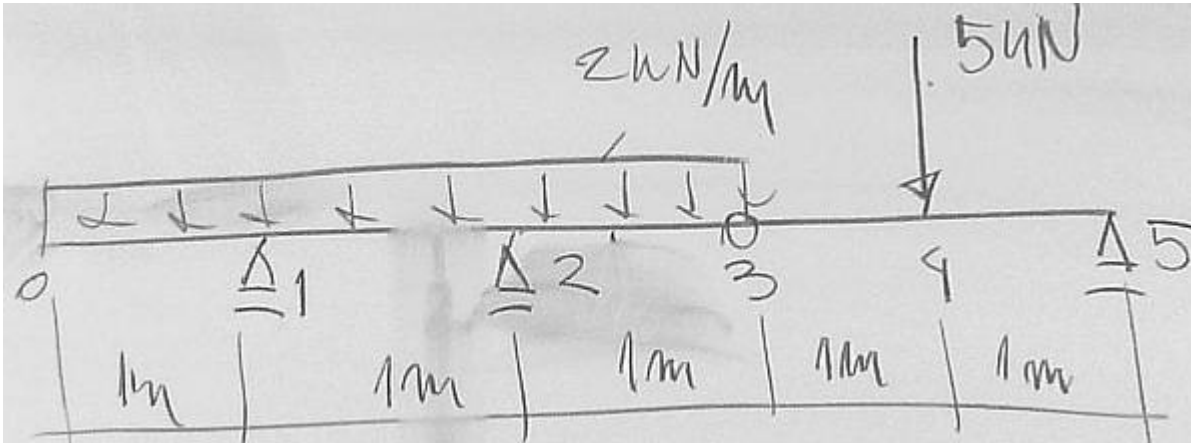


ORIGIN := 0



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

$$P := 5 \text{ kN}$$

$$\underline{L} := 5 \text{ m}$$

$$b := 5 \text{ cm}$$

$$h := 10 \text{ cm}$$

$$\underline{J} := b \cdot \frac{h^3}{12}$$

$$E := 14 \text{ GPa}$$

$$J = 416.667 \cdot \text{cm}^4$$

$$R5 := \frac{P}{2}$$

$$T3 := R5$$

$$R2 := \frac{q \cdot 3 \text{ m} \cdot 0.5 \text{ m} + T3 \cdot 2 \text{ m}}{1 \text{ m}}$$

$$R1 := q \cdot 3 \text{ m} - R2 + T3$$

$$R5 = 2.5 \cdot \text{kN}$$

$$T3 = 2.5 \cdot \text{kN}$$

$$R2 = 8 \cdot \text{kN}$$

$$R1 = 0.5 \cdot \text{kN}$$

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

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

$$\alpha = 17.142857 \cdot \frac{1}{\text{MN}}$$

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

$$M2(x) := M1(x) + R1 \cdot (x - 1_m)$$

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

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

$$i := 0 \dots n \quad X_i := i \cdot \Delta$$

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

$$\mathbf{i} := 2 \dots 3 \quad M_{\mathbf{i}} := M3(X_{\mathbf{i}})$$

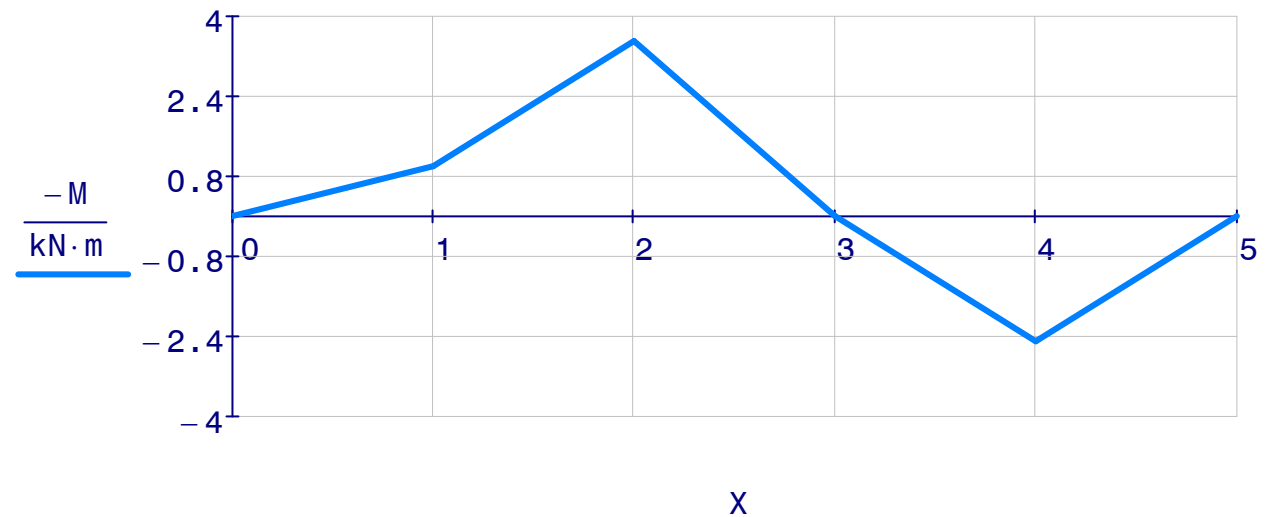
$$i := 4 \dots n \quad M_i := M4(X_i)$$

Układ równań metody różnic skończonych

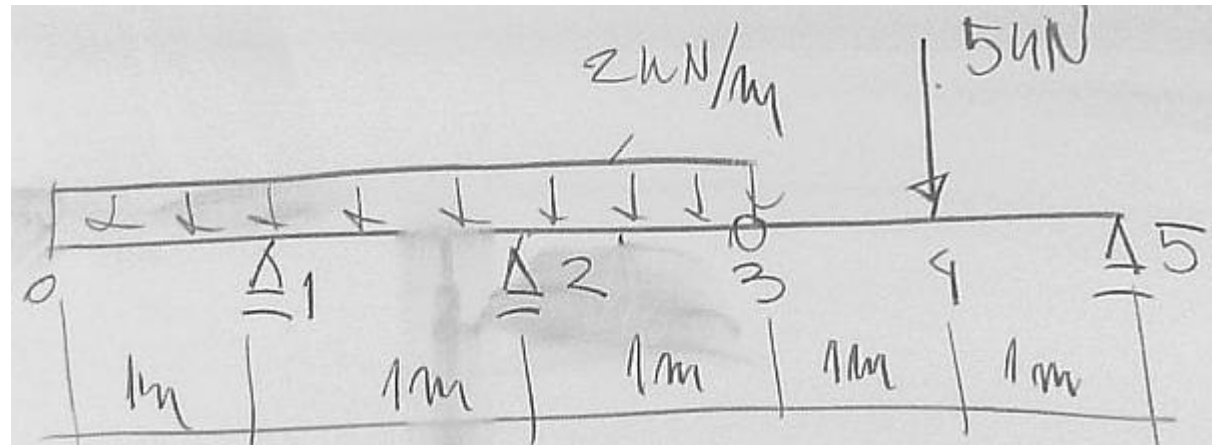
$$A \cdot y = \alpha \cdot M$$

$$M = \begin{bmatrix} & 0 \\ 0 & 0 \\ 1 & -1 \\ 2 & -3.5 \\ 3 & 0 \\ 4 & 2.5 \\ 5 & 0 \end{bmatrix} \cdot \text{kN} \cdot \text{m}$$

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



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



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

$$y = \begin{pmatrix} -17.143 \\ 0 \\ 0 \\ -60 \\ -51.429 \\ 0 \end{pmatrix} \cdot \text{mm}$$

