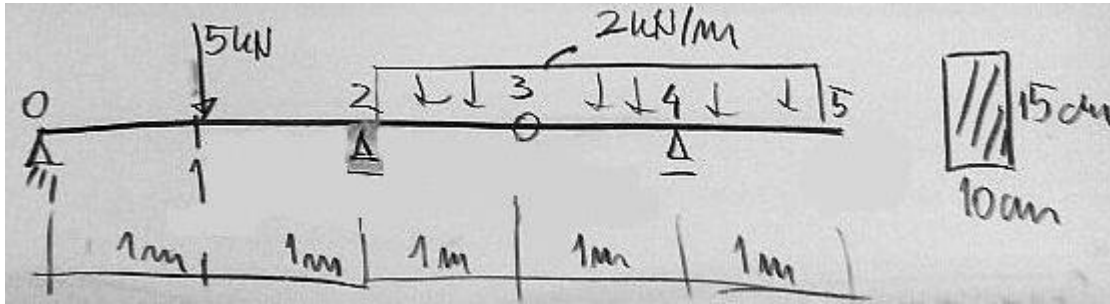


ORIGIN := 0



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

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

$$R4 := \frac{q \cdot 2 \text{ m} \cdot 1 \text{ m}}{1 \text{ m}} \quad T3 := q \cdot 2 \text{ m} - R4 \quad R2 := \frac{P \cdot 1 \text{ m} + T3 \cdot 3 \text{ m} + q \cdot 1 \text{ m} \cdot 2.5 \text{ m}}{2 \text{ m}}$$

$$R0 := T3 + q \cdot 1 \text{ m} + P - R2 \quad T3 = 0 \cdot \text{kN} \quad R0 = 2 \cdot \text{kN} \quad R4 = 4 \cdot \text{kN} \quad R2 = 5 \cdot \text{kN}$$

$$n := 5 \quad \Delta := \frac{L}{n} = 1 \text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 2.37037 \times 10^{-3} \cdot \frac{1}{\text{kN}}$$

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

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

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

$$M4(x) := M3(x) + R4 \cdot (x - 4 \text{ m})$$

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

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

$$i := 2 .. 4 \quad M_i := M3(X_i)$$

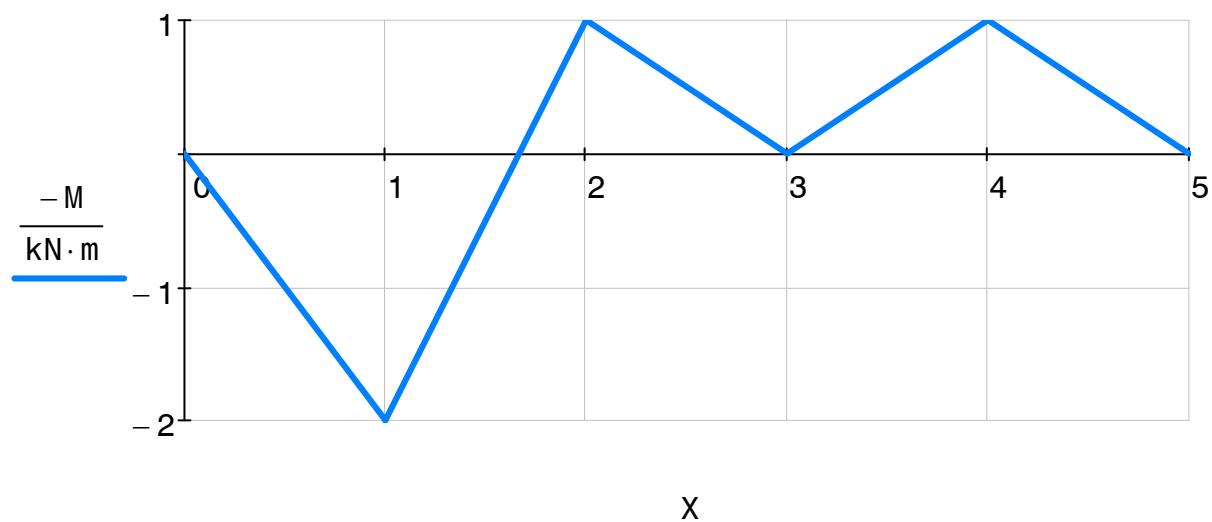
$$i := 4 .. n \quad M_i := M4(X_i)$$

*Układ równań metody różnic skończonych*

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

$$M = \begin{array}{|c|c|} \hline & 0 \\ \hline 0 & 0 \\ \hline 1 & 2 \\ \hline 2 & -1 \\ \hline 3 & 0 \\ \hline 4 & -1 \\ \hline 5 & 0 \\ \hline \end{array} \cdot \text{kN} \cdot \text{m} \quad X = \begin{array}{|c|c|} \hline & 0 \\ \hline 0 & 0 \\ \hline 1 & 1 \\ \hline 2 & 2 \\ \hline 3 & 3 \\ \hline 4 & 4 \\ \hline 5 & 5 \\ \hline \end{array} \text{m}$$

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



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

$y = \begin{pmatrix} 0.0000 \\ -2.3704 \\ 0.0000 \\ 0.0000 \\ 0.0000 \\ -2.3704 \end{pmatrix} \cdot \text{mm}$

