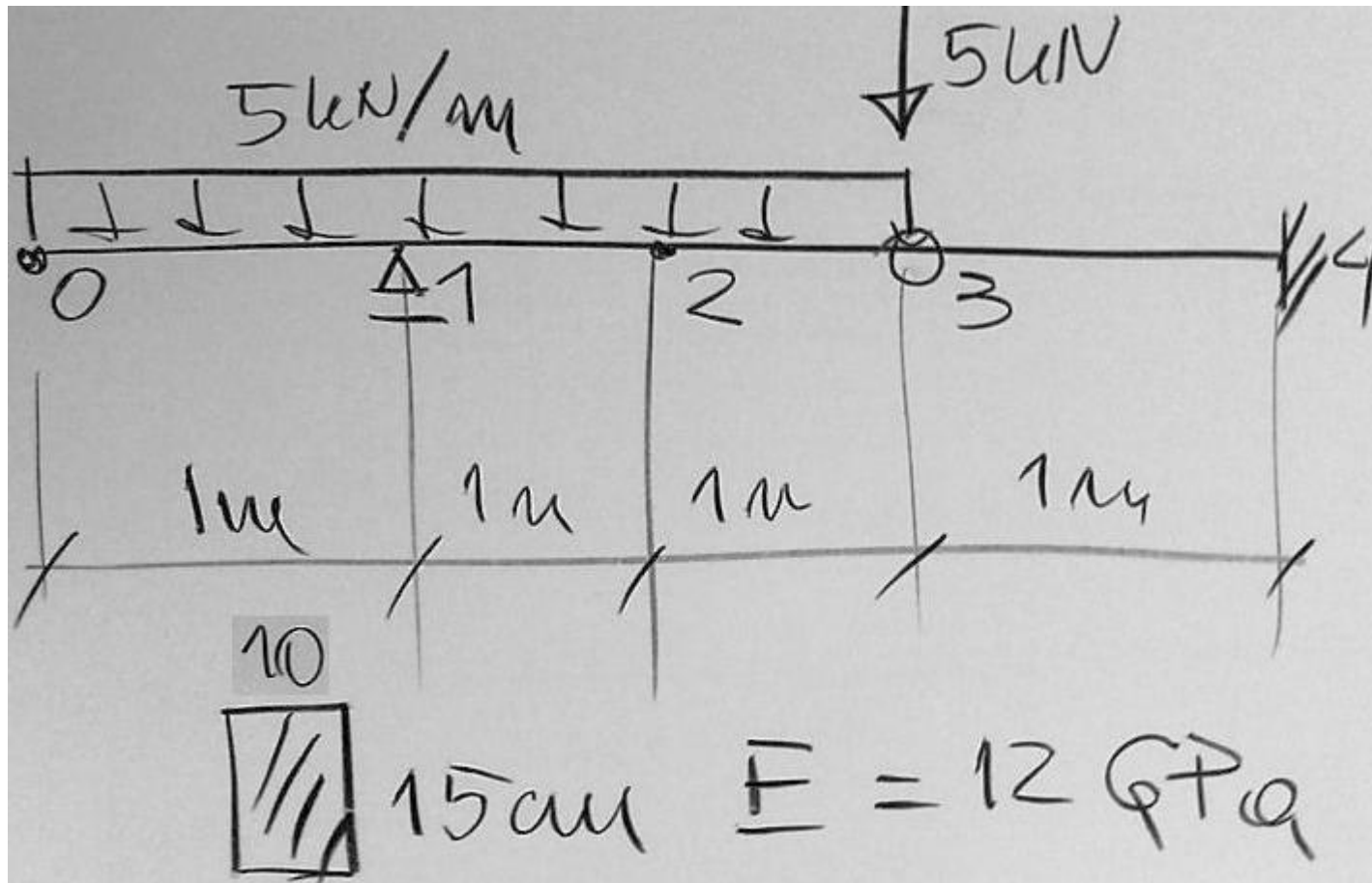


ORIGIN := 0



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

$$L := 4 \text{ m} \quad b := 10 \text{ cm} \quad h := 15 \text{ cm} \quad J := b \cdot \frac{h^3}{12} \quad E := 12 \text{ GPa}$$

$$R1 := \frac{q \cdot 3m \cdot 1.5m}{2m} = 11.25 \text{ kN} \quad R4 := P + q \cdot 3m - R1 = 8.75 \text{ kN}$$

$$M4 := R4 \cdot 1m \quad M4 = 8.75 \cdot \text{kN} \cdot \text{m}$$

$$n := 4 \quad \Delta := \frac{L}{n} = 1 \text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 2.963 \times 10^{-3} \cdot \frac{1}{\text{kN}}$$

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

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

$$M3(x) := -R4 \cdot (x - 3m)$$

$$i := 0 .. n$$

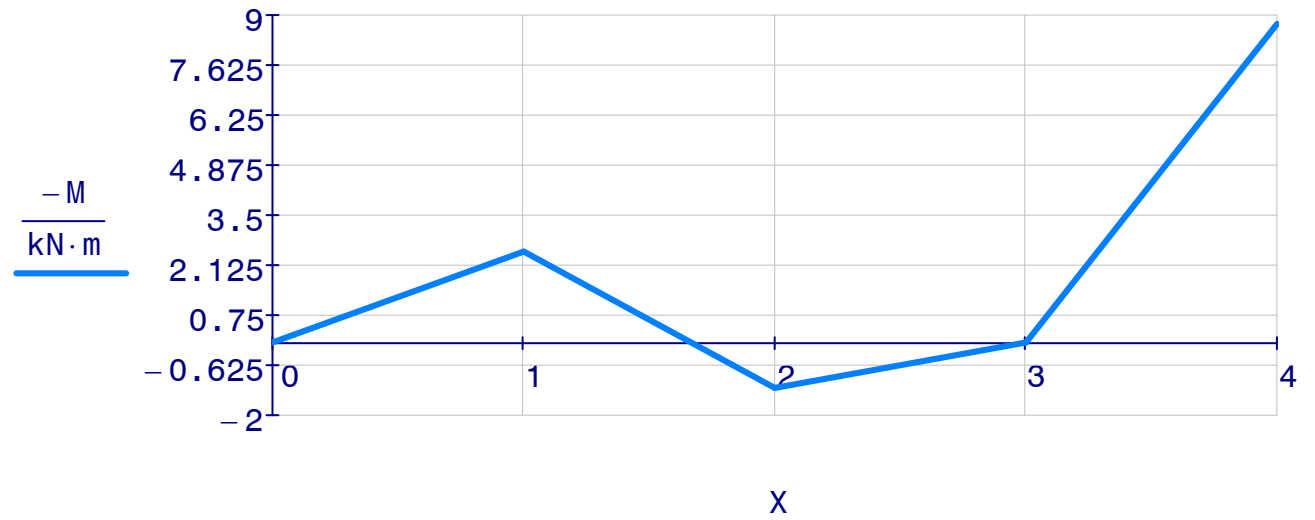
$$X_i := i \cdot \Delta$$

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

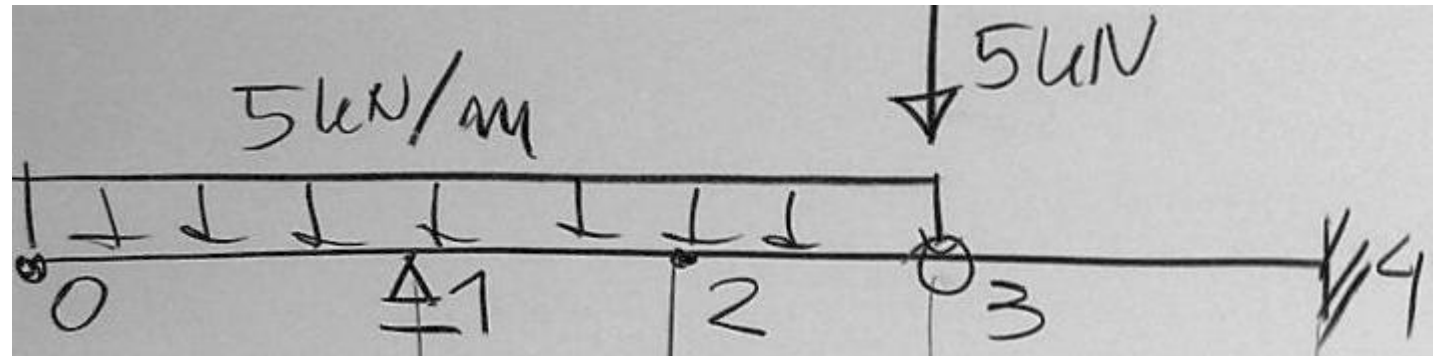
$$i := 1 .. 3 \quad M_i := M2(X_i)$$

$$i := 3 \dots 4 \quad M_i := M3(X_i)$$

$$M = \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 1 & -2.5 \\ 2 & 1.25 \\ 3 & 0 \\ 4 & -8.75 \end{bmatrix} \cdot \text{kN} \cdot \text{m} \quad X = \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 1 & 1 \\ 2 & 2 \\ 3 & 3 \\ 4 & 4 \end{bmatrix} \text{m}$$



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



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

$$y = \begin{pmatrix} 0.926 \\ 0 \\ -8.333 \\ -12.963 \\ 0 \end{pmatrix} \cdot \text{mm}$$

