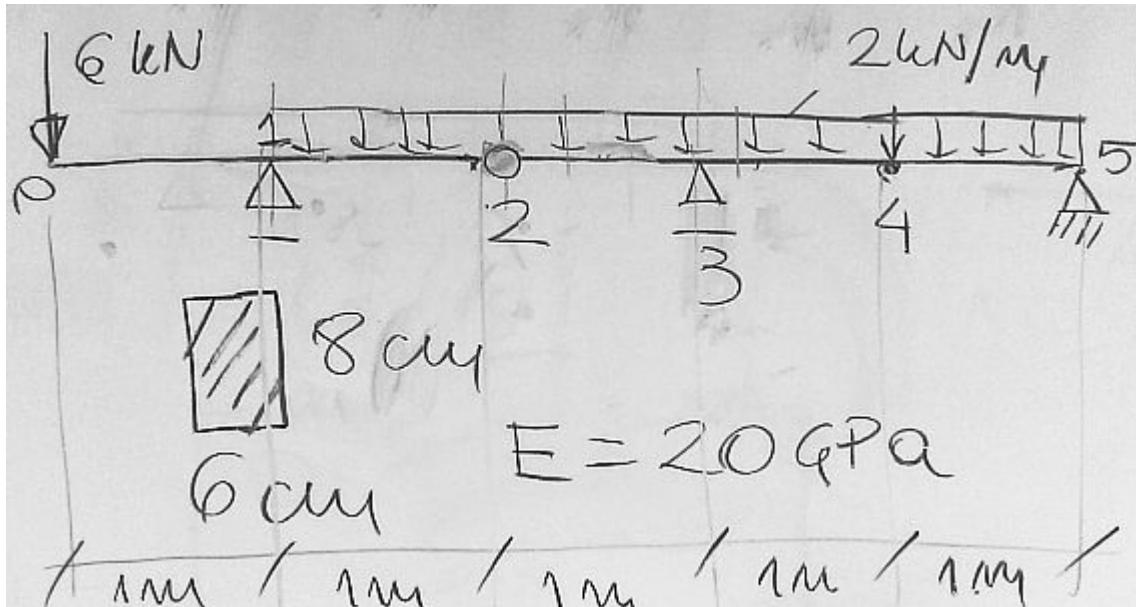


Grupa 1

ORIGIN := 0



$$P := 6 \text{ kN} \quad q := 2 \frac{\text{kN}}{\text{m}}$$

$$\underline{L} := 5 \text{ m} \quad b := 6 \text{ cm} \quad h := 8 \text{ cm} \quad \underline{J} := b \cdot \frac{h^3}{12} \quad E := 20 \text{ GPa}$$

$$R1 := \frac{q \cdot 1 \text{ m} \cdot 0.5 \text{ m} + P \cdot 2 \text{ m}}{1 \text{ m}} = 13 \cdot \text{kN}$$

$$T2 := P + q \cdot 1 \text{ m} - R1 = -5 \cdot \text{kN}$$

$$R3 := \frac{q \cdot 3 \text{ m} \cdot 1.5 \text{ m} + T2 \cdot 3 \text{ m}}{2 \text{ m}} = -3 \cdot \text{kN}$$

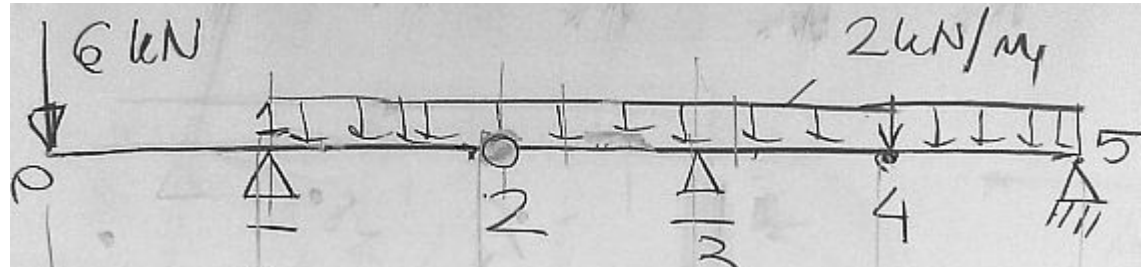
$$R5 := q \cdot 3 \text{ m} + T2 - R3 = 4 \cdot \text{kN}$$

$$n := 5 \quad \Delta := \frac{L}{n} = 1 \text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 19.531 \cdot \frac{1}{\text{MN}}$$

$$M1(x) := -P \cdot x$$

$$M2(x) := M1(x) + R1 \cdot (x - 1\text{m}) - q \cdot \frac{(x - 1\text{m})^2}{2}$$

$$M3(x) := M2(x) + R3 \cdot (x - 3\text{m})$$



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

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

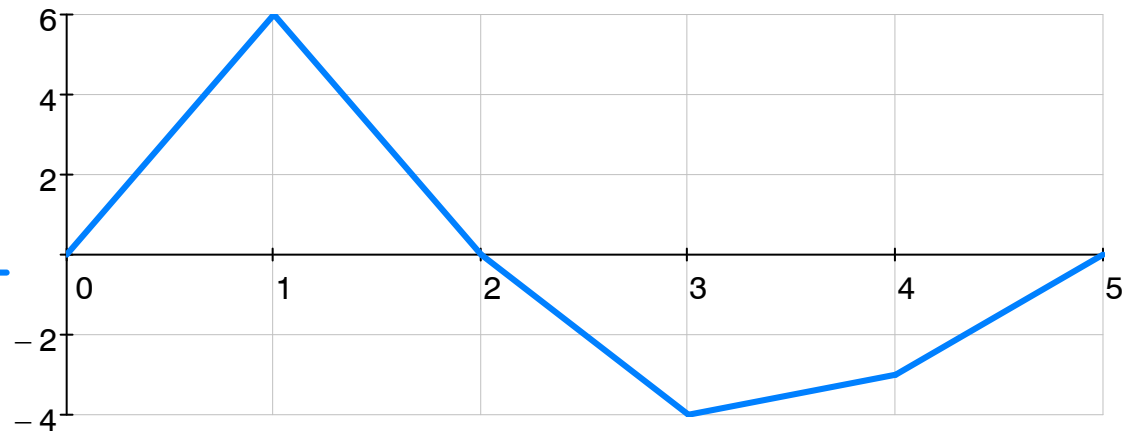
$$i := 2..3 \quad M_i := M2(X_i)$$

$$i := 3..n \quad M_i := M3(X_i)$$

$$M = \begin{array}{|c|c|} \hline & 0 \\ \hline 0 & 0 \\ \hline 1 & -6 \\ \hline 2 & 0 \\ \hline 3 & 4 \\ \hline 4 & 3 \\ \hline 5 & 0 \\ \hline \end{array} \cdot \text{kN} \cdot \text{m}$$

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

$\frac{-M}{\text{kN} \cdot \text{m}}$



x

Równania MRS

$$y_1 = 0$$

$$y_3 = 0$$

$$y_5 = 0$$

$$y_0 - 2y_1 + y_2 = \alpha M_1$$

$$y_0 + y_2 = \alpha M_1$$

$$y_2 - 2y_3 + y_4 = \alpha M_3$$

$$y_2 + y_4 = \alpha M_3$$

$$y_3 - 2y_4 + y_5 = \alpha M_4$$

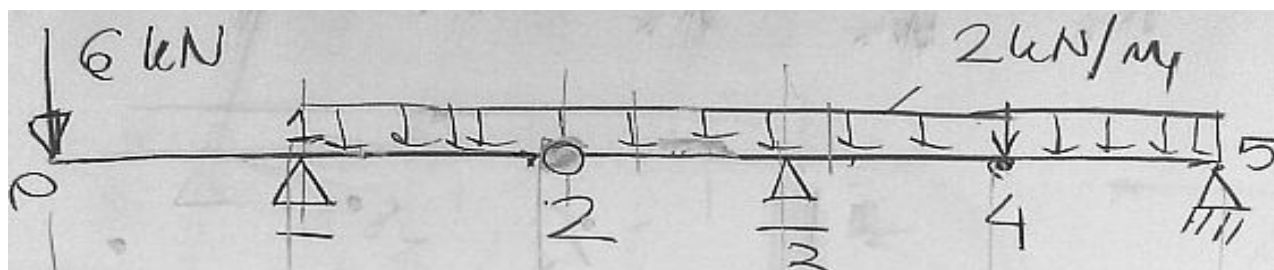
$$-2y_4 = \alpha M_4$$

$$\alpha = 19.531 \cdot \frac{1}{\text{MN}}$$

M =

	0
0	0
1	-6
2	0
3	4
4	3
5	0

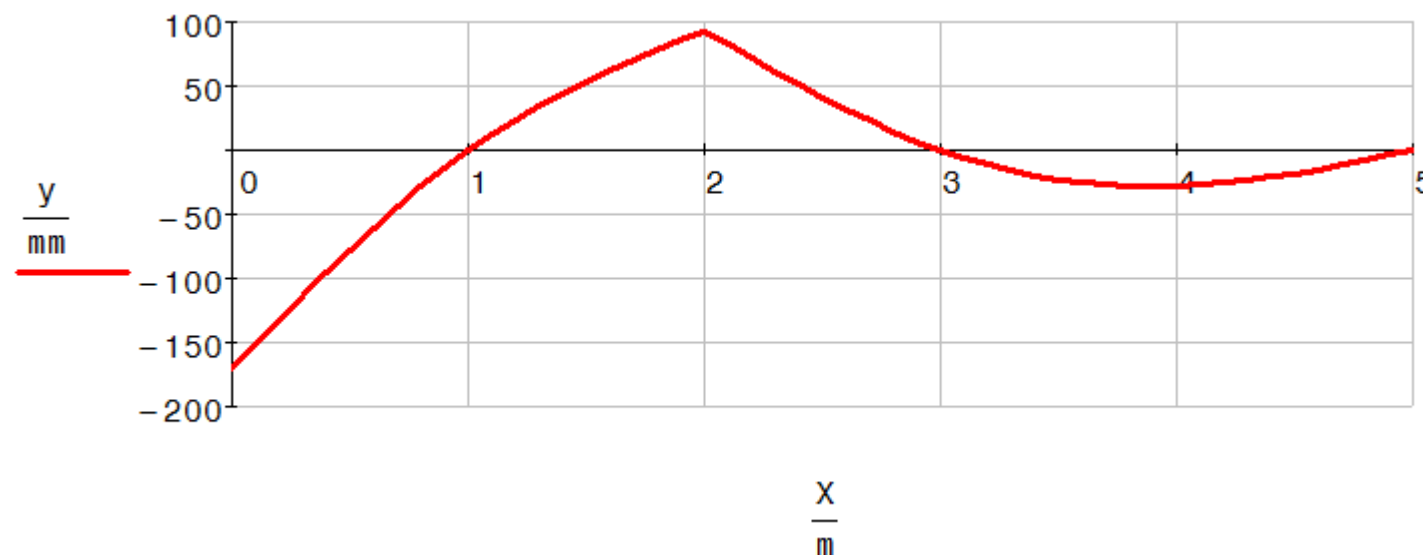
· kN · m



y =

	0
0	-224.61
1	0.00
2	107.42
3	0.00
4	-29.30
5	0.00

· mm



Wartości obliczone przy założeniu $\Delta = 1\text{m}$

Wykres dokładny obliczony przy założeniu $\Delta = 10\text{cm}$