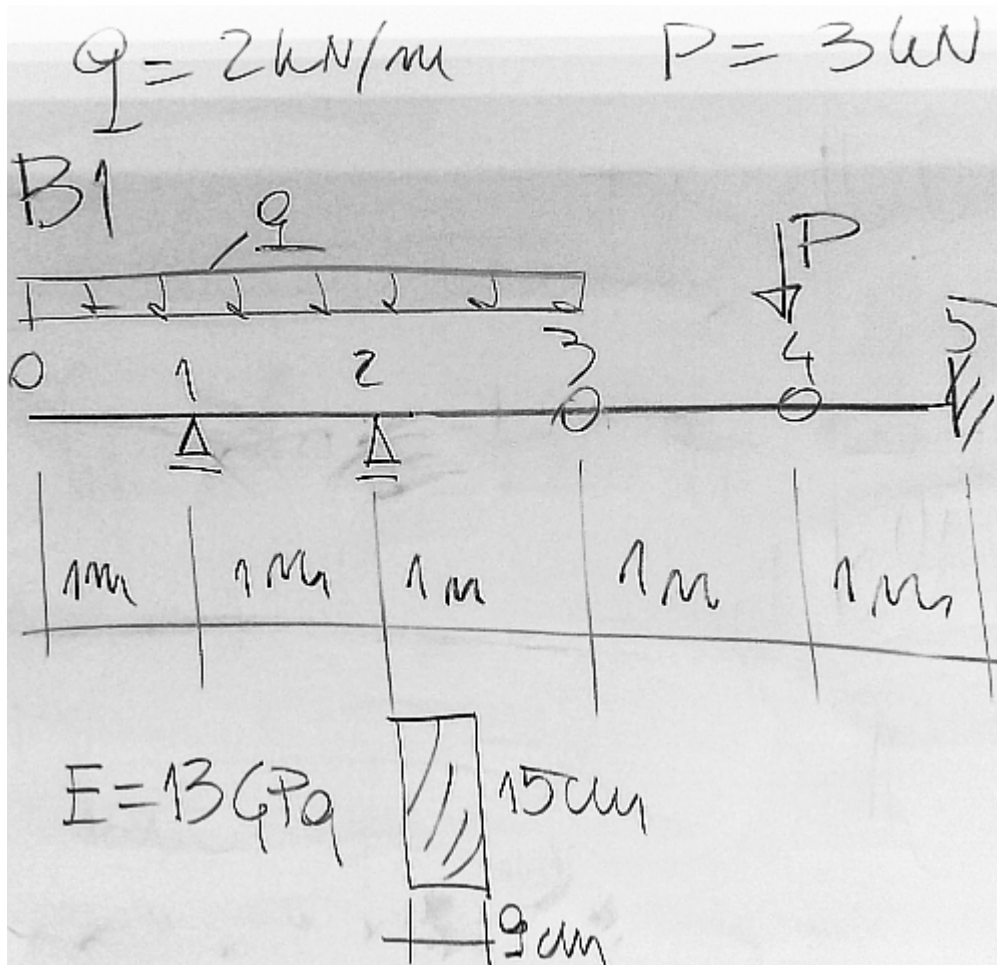


Metoda różnic skończonych - ugięcie belki B1



$$P := 3 \text{ kN} \quad q := 2 \frac{\text{kN}}{\text{m}} \quad E := 13 \text{ GPa}$$

$$b := 9 \text{ cm} \quad h := 15 \text{ cm}$$

$$L := 5 \text{ m} \quad J := b \cdot \frac{h^3}{12} = 2531.25 \cdot \text{cm}^4$$

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

$$\alpha := \frac{\Delta^2}{E \cdot J} = 3.03894 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{ mm}$

$$T3 := 0 \quad R1 := \frac{q \cdot 3 \text{ m}}{2} \quad R2 := R1$$

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

$$M4(x) := M3(x) + q \cdot \frac{(x - 3 \text{ m})^2}{2}$$

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

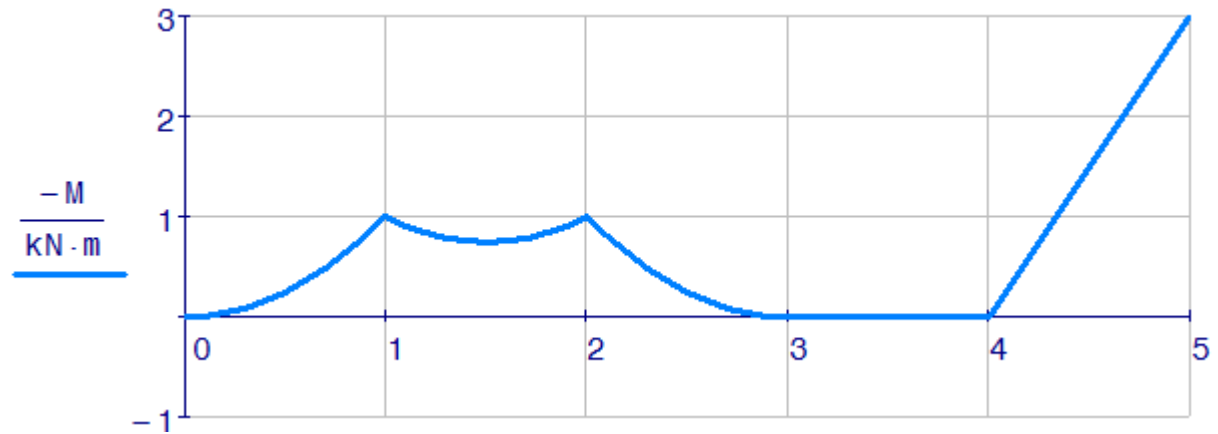
$$M5(x) := M4(x) - P \cdot (x - 4 \text{ m})$$

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

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

$$\frac{X}{\text{m}} =$$

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



Warunki brzegowe

$$y_1 = 0 \quad y_2 = 0 \quad y_5 = 0 \quad \varphi_5 = 0 \quad \text{-----} > \quad 2 y_4 = \alpha M_5$$

Równania MRS

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

$$y_1 - 2 y_2 + y_3 = \alpha M_2$$

$$2 y_4 = \alpha M_5$$

$$y =$$

	0
0	-3.039
1	0.000
2	0.000
3	-3.039
4	-4.558
5	0.000

· mm

$$\alpha = 3.03894 \cdot \frac{1}{\text{MN}}$$