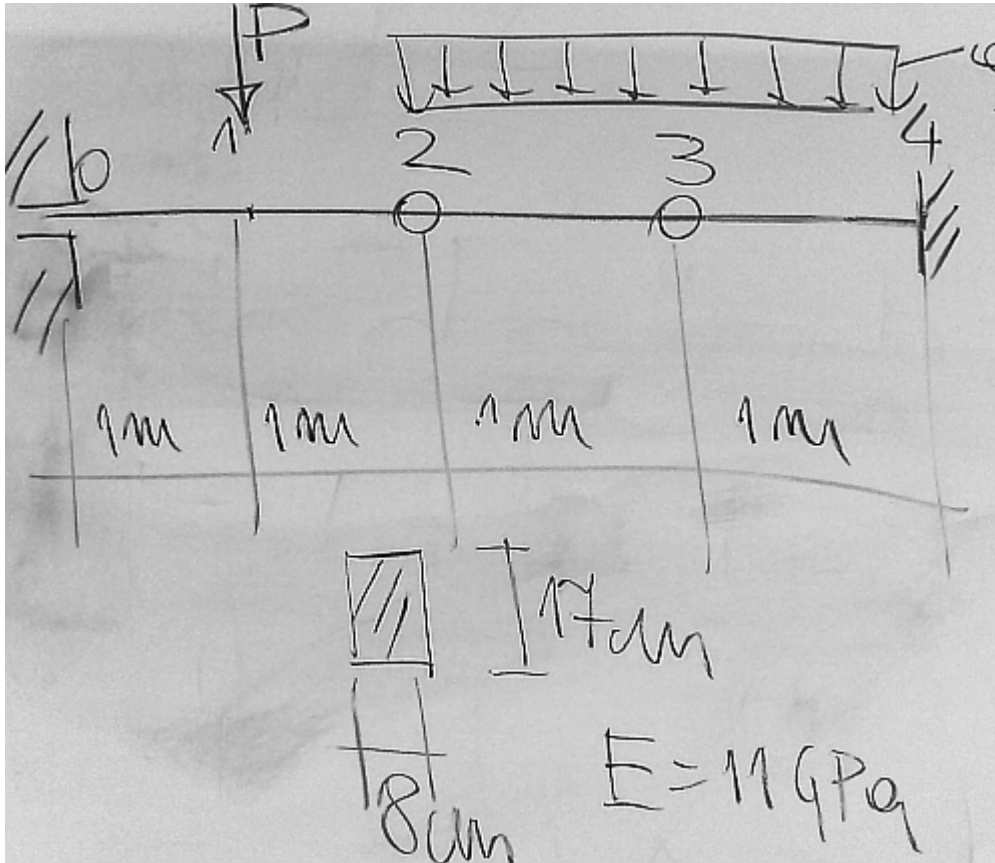


Metoda różnic skończonych - ugięcie belki



$$P := 3 \text{ kN} \quad q := 2 \frac{\text{kN}}{\text{m}} \quad E := 11 \text{ GPa}$$

$$b := 8 \text{ cm} \quad h := 17 \text{ cm}$$

$$L := 4 \text{ m} \quad J := b \cdot \frac{h^3}{12} = 3275.3333 \cdot \text{cm}^4$$

$$n := 4 \quad \Delta := \frac{L}{n} = 1 \text{ m}$$

$$\alpha := \frac{\Delta^2}{E \cdot J} = 2.77557 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{ mm}$

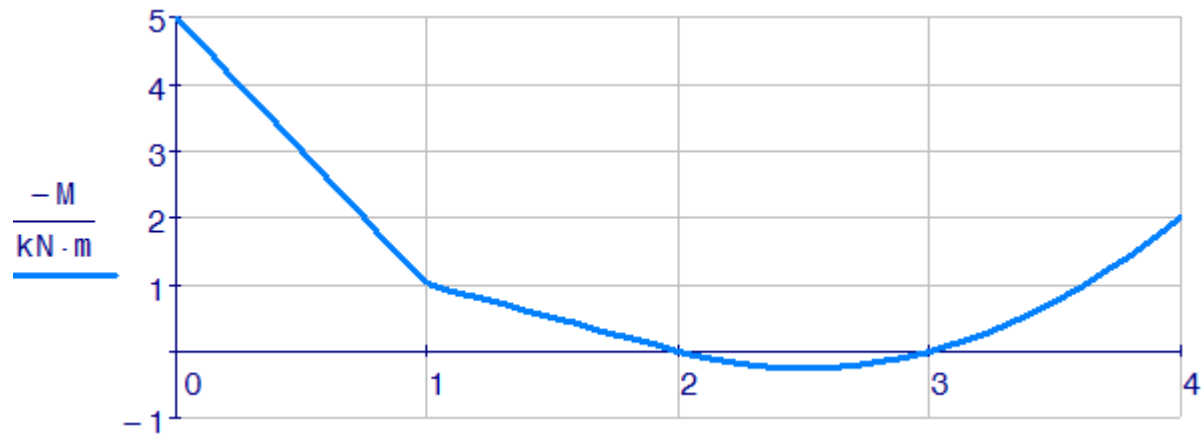
$$T2 := \frac{q \cdot 1 \text{ m}}{2} \quad R0 := P + T2 \quad M0 := P \cdot 1 \text{ m} + T2 \cdot 2 \text{ m}$$

$$M1(x) := -M0 + R0 \cdot x \quad M2(x) := M1(x) - P \cdot (x - 1 \text{ m})$$

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

$\frac{M}{\text{kN} \cdot \text{m}} =$		0
	0	-5
	1	-1
	2	0
	3	0
	4	-2

$\frac{X}{\text{m}} =$		0
	0	0
	1	1
	2	2
	3	3
	4	4



Warunki brzegowe

$$y_0 = 0 \quad \varphi_0 = 0 \quad \text{-----} \rightarrow \quad 2 y_1 = \alpha M_0$$

$$y_4 = 0 \quad \varphi_4 = 0 \quad \text{-----} \rightarrow \quad 2 y_3 = \alpha M_4$$

Równania MRS

$$2 y_1 = \alpha M_0$$

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

$$2 y_3 = \alpha M_4$$

$y =$		0
	0	0.000
	1	-6.939
	2	-16.653
	3	-2.776
	4	0.000

· mm

$$\alpha = 2.77557 \cdot \frac{1}{\text{MN}}$$