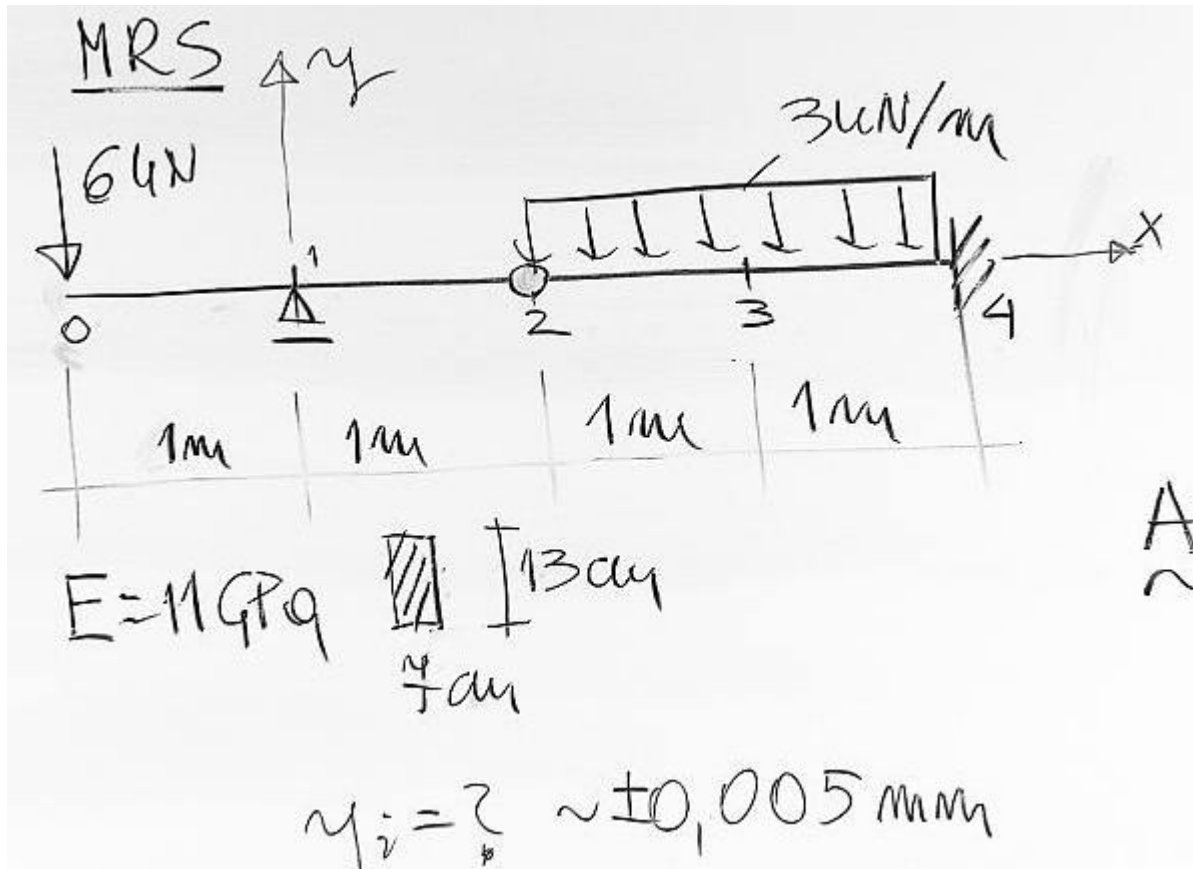


## Metoda różnic skończonych - ugięcie belki



$$P := 6 \text{ kN} \quad q := 3 \frac{\text{kN}}{\text{m}} \quad E := 11 \text{ GPa}$$

$$b := 7 \text{ cm} \quad h := 13 \text{ cm}$$

$$L := 4 \text{ m} \quad J := b \cdot \frac{h^3}{12} = 1281.5833 \cdot \text{cm}^4$$

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

$$\alpha := \frac{\Delta^2}{E \cdot J} = 7.0935 \cdot \frac{1}{\text{MN}}$$

dokładność  $y \pm 0.005 \text{ mm}$

$$R1 := P \cdot 2$$

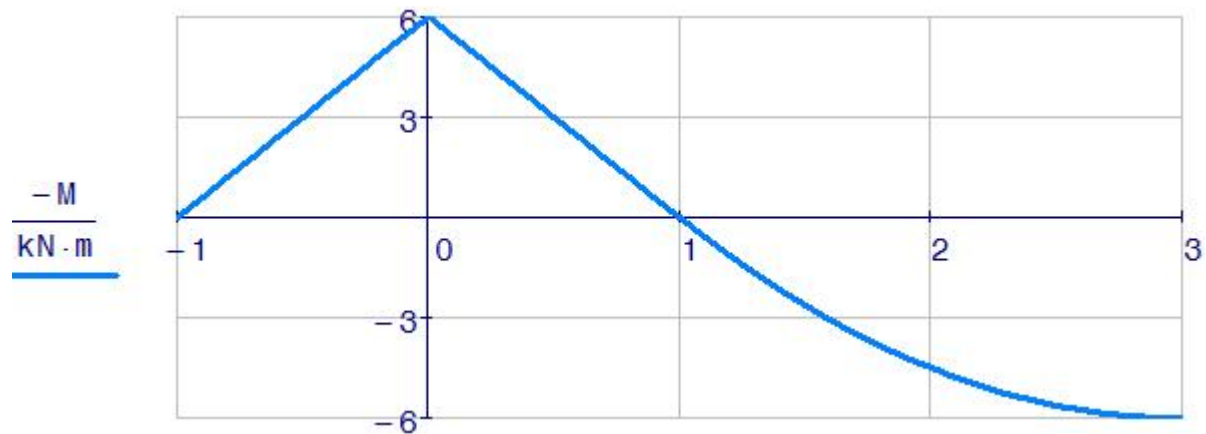
$$M1(x) := -P \cdot (1 \text{ m} + x) \quad M2(x) := M1(x) + R1 \cdot x \quad M3(x) := M2(x) - q \cdot \frac{(x - 1 \text{ m})^2}{2}$$

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

	0
0	0
1	-6
2	0
3	4.5
4	6

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

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



*Warunki brzegowe*

$$y_1 = 0$$

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

*Równania MRS*

$$2 y_3 = \alpha M_4$$

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

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

$$y =$$

	0
0	-117.04
1	0.00
2	74.48
3	21.28
4	0.00

$$\cdot \text{mm}$$

$$\alpha = 7.0935 \cdot \frac{1}{\text{MN}}$$