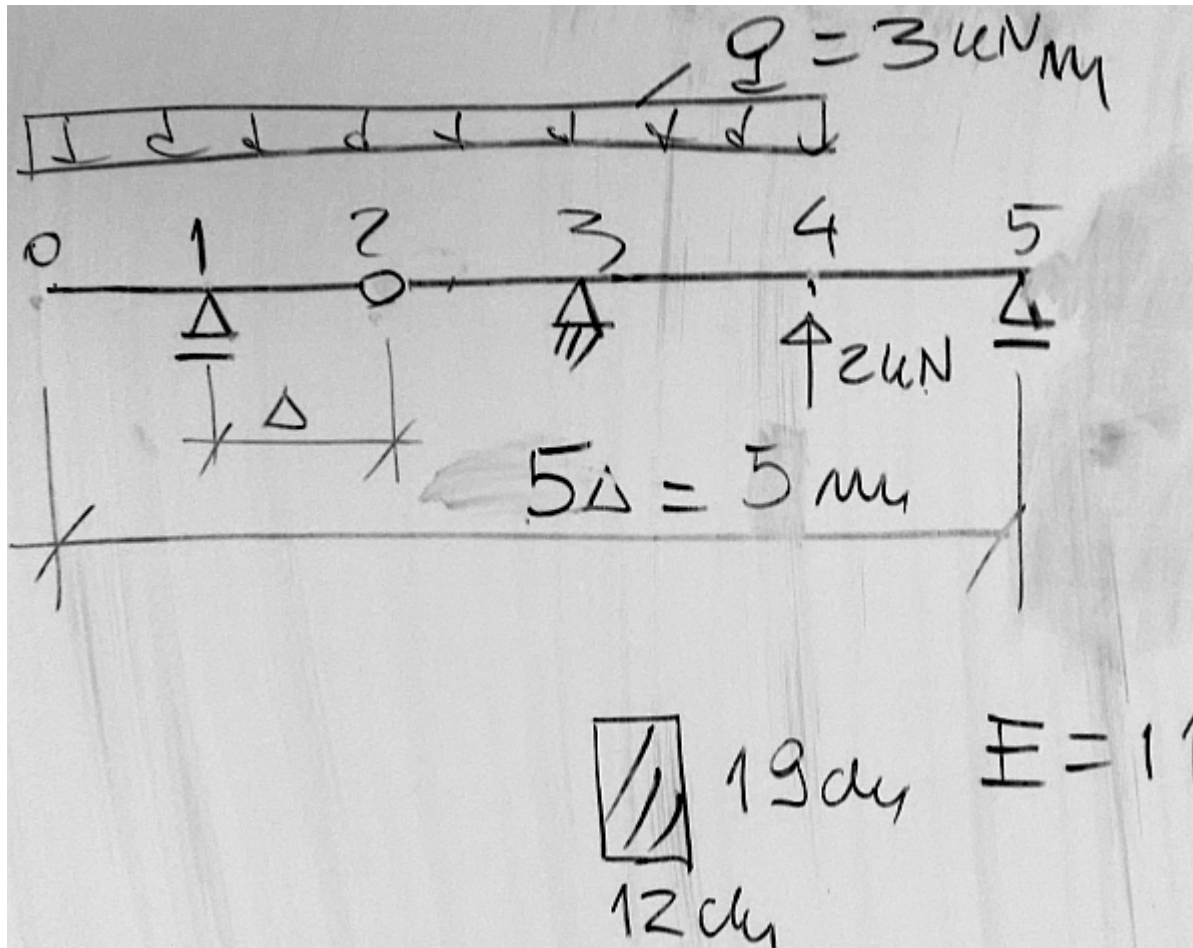


Metoda różnic skończonych - ugięcie belki



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

$$b := 12 \text{ cm} \quad h := 19 \text{ cm}$$

$$L := 5 \text{ m} \quad J := b \cdot \frac{h^3}{12} = 6859 \cdot \text{cm}^4$$

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

$$\alpha := \frac{\Delta^2}{E \cdot J} = 1.3254 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{ mm}$

$$R1 := q \cdot 2 \text{ m} = 6 \cdot \text{kN} \quad R3 := \frac{q \cdot 4 \text{ m} \cdot 3 \text{ m} - P \cdot 1 \text{ m} - R1 \cdot 4 \text{ m}}{2 \text{ m}} = 5 \cdot \text{kN}$$

$$M1(x) := -q \cdot \frac{x^2}{2} \quad M2(x) := M1(x) + R1 \cdot (x - 1 \text{ m}) \quad M3(x) := M2(x) + R3 \cdot (x - 3 \text{ m})$$

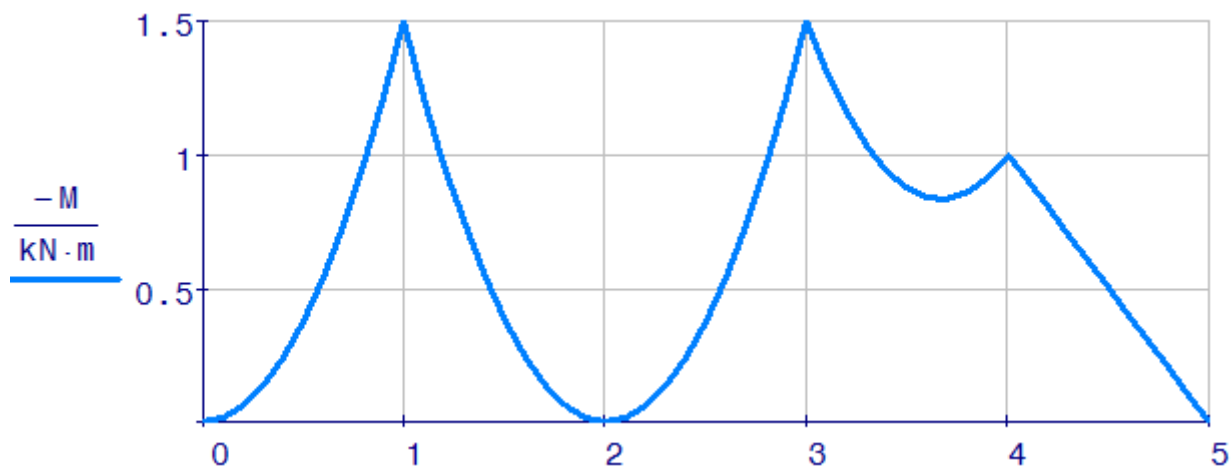
$$M4(x) := M3(x) + P \cdot (x - 4 \text{ m}) + q \cdot \frac{(x - 4 \text{ m})^2}{2}$$

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

	0
0	0
1	-1.5
2	0
3	-1.5
4	-1
5	0

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

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



Warunki brzegowe

$$y_1 = 0 \quad y_3 = 0 \quad y_5 = 0$$

Równania MRS

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

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

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

$$y =$$

	0
0	0.663
1	0.000
2	-2.651
3	0.000
4	0.663
5	0.000

· mm

$$\alpha = 1.3254 \cdot \frac{1}{\text{MN}}$$

