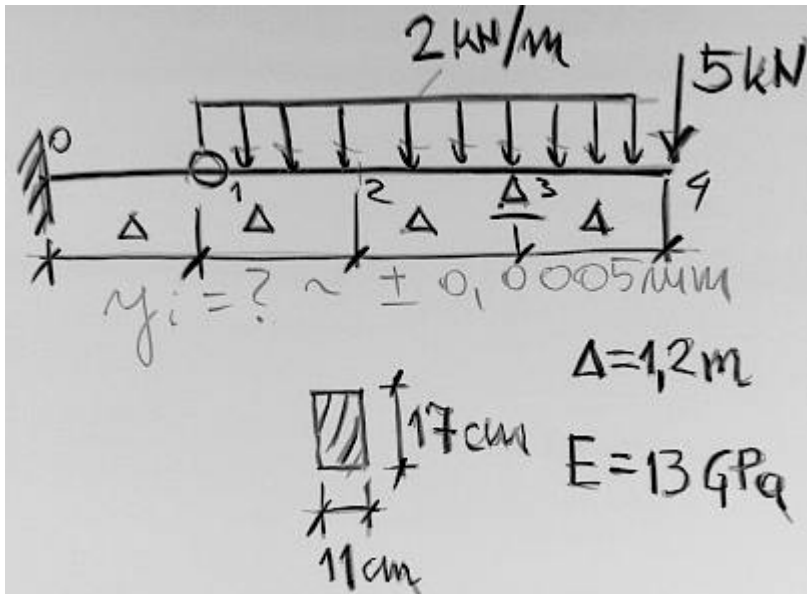


Metoda różnic skończonych - ugięcie belki Grupa1



$$P := 5 \text{ kN} \quad q := 2 \frac{\text{kN}}{\text{m}} \quad E := 13 \text{ GPa}$$

$$b := 11 \text{ cm} \quad h := 17 \text{ cm} \quad \Delta := 1.2 \text{ m}$$

$$n := 4 \quad L := 4 \cdot \Delta = 4.8 \text{ m}$$

$$J := b \cdot \frac{h^3}{12} = 4503.5833 \cdot \text{cm}^4$$

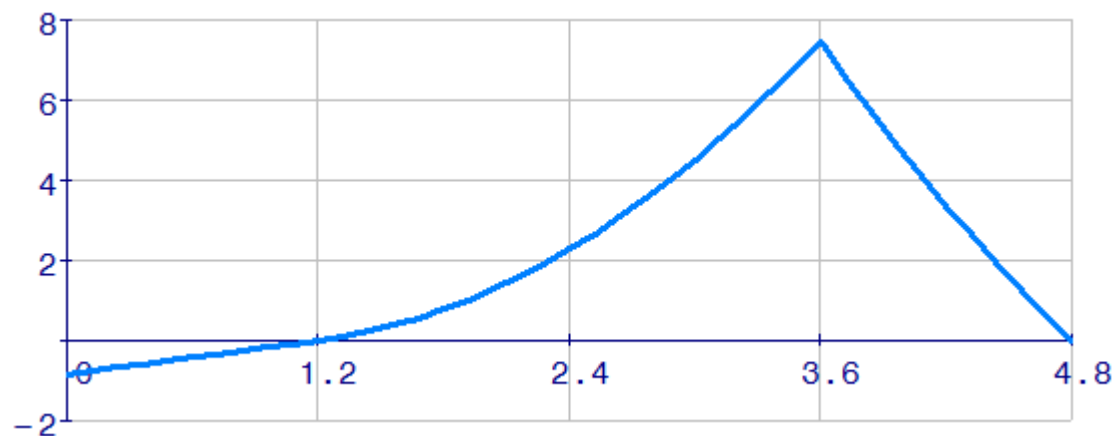
$$\alpha := \frac{\Delta^2}{E \cdot J} = 2.45958 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{ mm}$

$$R3 := \frac{q \cdot 3\Delta \cdot 1.5 + P \cdot 3}{2} = 12.9 \cdot \text{kN} \quad M1(x) := -q \cdot \frac{(L-x)^2}{2} - P \cdot (L-x)$$

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

$\frac{M}{\text{kN} \cdot \text{m}} =$		0	$\frac{X}{\text{m}} =$		0
	0	0.84		0	0
	1	-0		1	1.2
	2	-2.28		2	2.4
	3	-7.44		3	3.6
	4	0		4	4.8



Warunki brzegowe

$$y_1 = 0 \quad \varphi_1 = 0 \quad \text{-----} \rightarrow \quad 2y_1 = \alpha M_0 \quad y_3 = 0$$

Równania MRS

$$2y_1 = \alpha M_0$$

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

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

$y =$		0	$\cdot \text{mm}$
	0	-0.000	
	1	1.033	
	2	3.320	
	3	0.000	
	4	-21.620	

$$\alpha = 2.45958 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{mm}$

