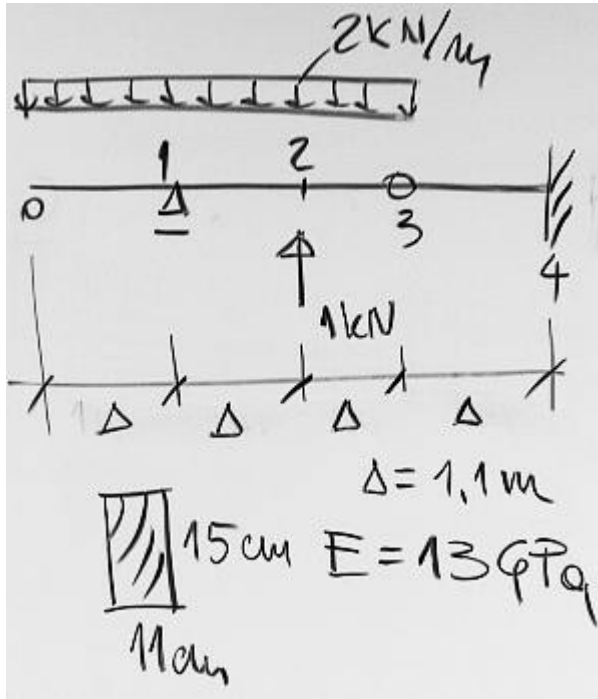


Metoda różnic skończonych - ugięcie belki Grupa1



$$P := 1 \text{ kN} \quad q := 2 \frac{\text{kN}}{\text{m}} \quad E := 13 \text{ GPa}$$

$$b := 11 \text{ cm} \quad h := 15 \text{ cm} \quad \Delta := 1.1 \text{ m}$$

$$n := 4 \quad L := 4 \cdot \Delta = 4.4 \text{ m}$$

$$J := b \cdot \frac{h^3}{12} = 3093.75 \cdot \text{cm}^4$$

$$\alpha := \frac{\Delta^2}{E \cdot J} = 3.00855 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{ mm}$

$$R1 := \frac{q \cdot 3\Delta \cdot 1.5 - P \cdot 1}{2} = 4.45 \cdot \text{kN}$$

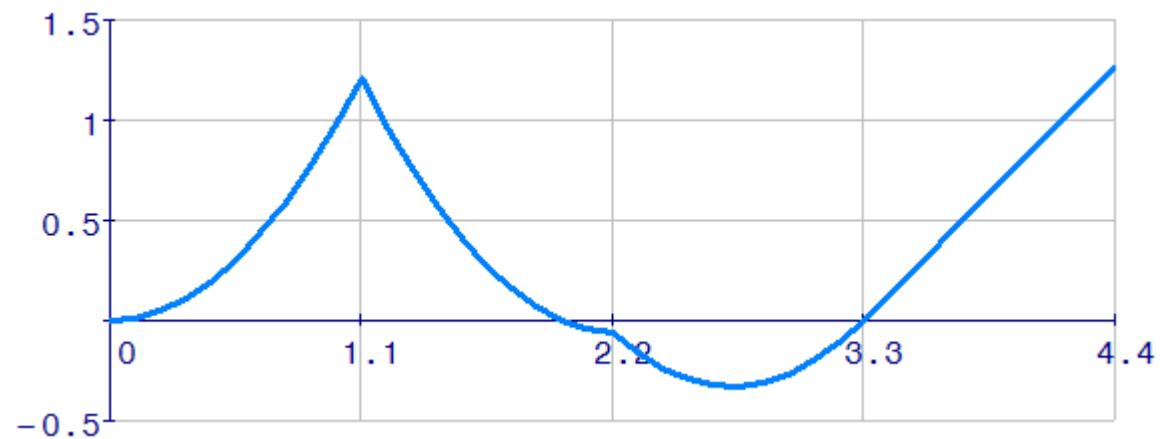
$$M1(x) := -q \cdot \frac{x^2}{2}$$

$$M2(x) := M1(x) + R1 \cdot (x - \Delta)$$

$$M3(x) := M2(x) + P \cdot (x - 2\Delta)$$

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

$\frac{M}{\text{kN} \cdot \text{m}} =$		0	$\frac{X}{\text{m}} =$		0
	0	0		0	0
	1	-1.21		1	1.1
	2	0.055		2	2.2
	3	0		3	3.3
	4	-1.265		4	4.4



Warunki brzegowe

$$y_1 = 0 \quad y_4 = 0 \quad \varphi_4 = 0 \quad \text{-----} \rightarrow 2y_3 = \alpha M_4$$

Równania MRS

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

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

$$2y_3 = \alpha M_4$$

$y =$		0	$\cdot \text{mm}$
	0	-2.606	
	1	0.000	
	2	-1.034	
	3	-1.903	
	4	0.000	

$$\alpha = 3.00855 \cdot \frac{1}{\text{MN}}$$

dokładność $y \pm 0.0005 \text{mm}$

