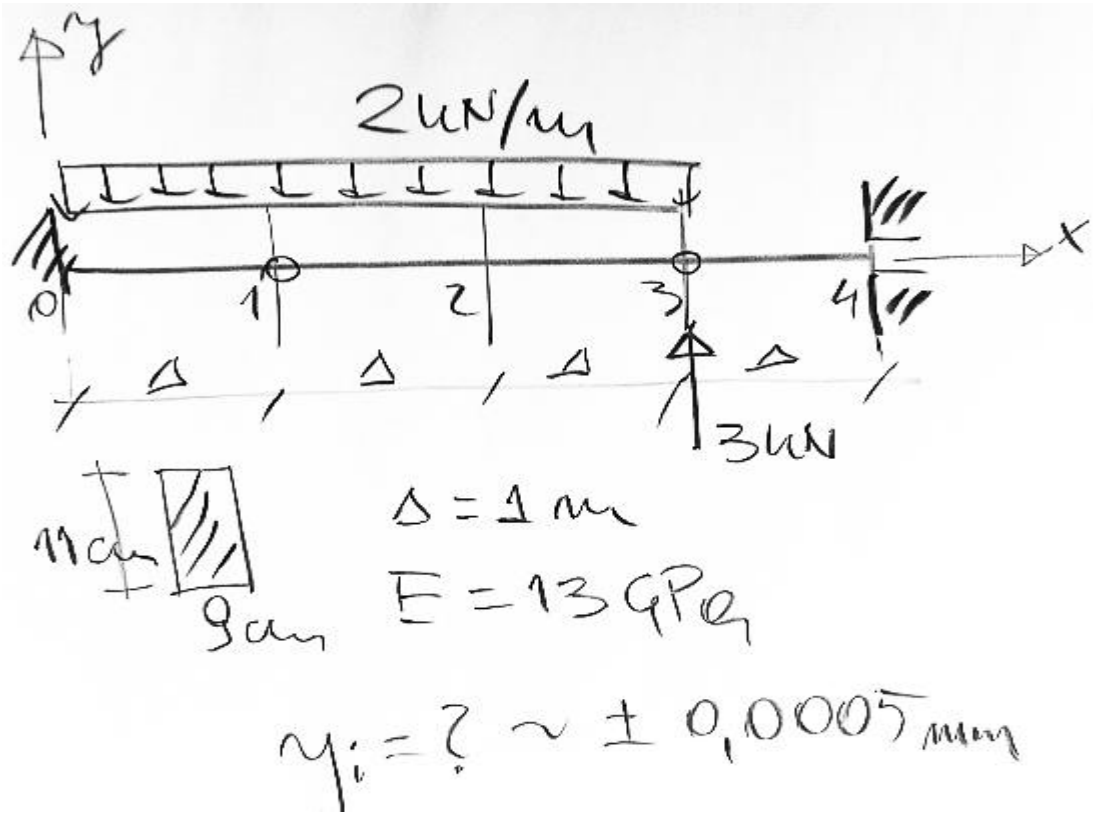
Metoda różnic skończonych - ugięcie belki



$P := 3kN \qquad q := 2\frac{kN}{m} \qquad E := 13GPa$

$b := 9cm \qquad h := 11cm \qquad L := 4 \cdot 1m$

$n := 4 \qquad \Delta := \frac{L}{n} = 1\,m$

$J := b \cdot \frac{h^3}{12} = 998.25 \cdot cm^4$

$\alpha := \frac{\Delta^2}{E \cdot J} = 7.70579 \cdot \frac{1}{MN}$

dokładność y ±0.005mm

$R0 := q \cdot 2\Delta = 4 \cdot kN \qquad M0 := q \cdot \Delta^2 \cdot 1.5 = 3 \cdot kN \cdot m$

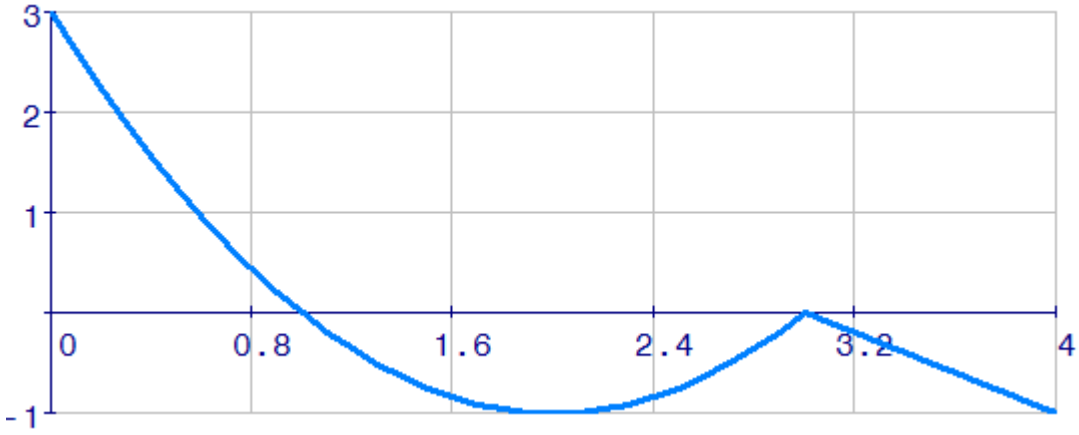
$M1(x) := -M0 + R0 \cdot x - q \cdot \frac{x^2}{2} \qquad M2(x) := M1(x) + q \cdot \frac{(x - 3\Delta)^2}{2} + P \cdot (x - 3 \cdot \Delta)$

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

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

$\frac{X}{m} =$

	0
0	0
1	1
2	2
3	3
4	4



Warunki brzegowe

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

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

Równania MRS

$2\,y_1 = \alpha M_0$

$y_1 - 2\,y_2 + y_3 = \alpha M_1$

$2\,y_3 = \alpha M_4$

$y =$

	0
0	0.000
1	-11.559
2	-7.706
3	3.853
4	0.000

$\cdot mm$

$\alpha = 7.70579 \cdot \frac{1}{MN}$

dokładność y ±0.0005mm