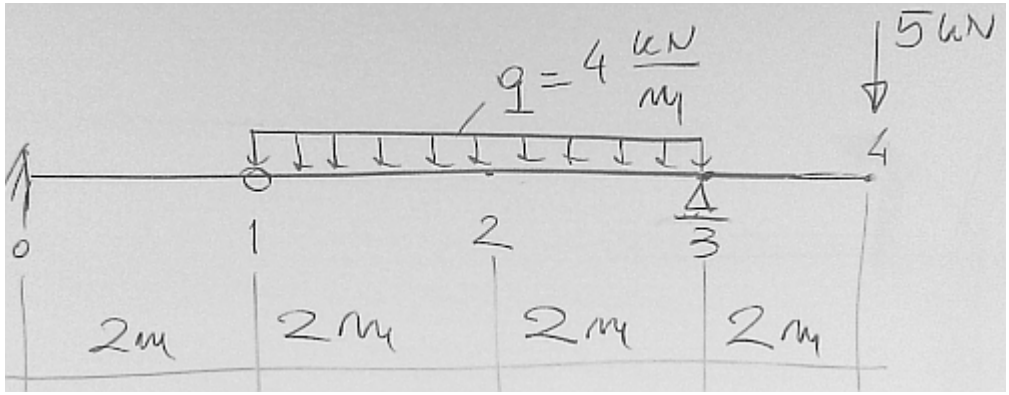
Metoda różnic skończonych - ugięcie belki



$P := 5kN \qquad q := 4\frac{kN}{m} \qquad E := 12GPa$

$L := 8m \qquad b := 12cm \qquad h := 17cm \qquad J := b\cdot\frac{h^3}{12} = 4913\cdot cm^4 \qquad n := 4 \qquad \Delta := \frac{L}{n} = 2\,m$

$R3 := \frac{q\cdot 4m\cdot 2m + P\cdot 6m}{4m} = 15.5\cdot kN$

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

$M1(x) := -P\cdot(8m - x)$

$M2(x) := M1(x) + R3\cdot(6m - x) - q\cdot\frac{(6m - x)^2}{2}$

$M3(x) := M2(x) + q\cdot\frac{(2m - x)^2}{2}$

$M =$

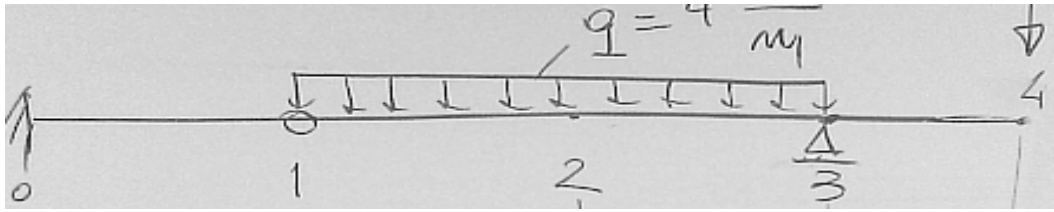
	0
0	-11
1	0
2	3
3	-10
4	0

$\cdot kN \cdot m$

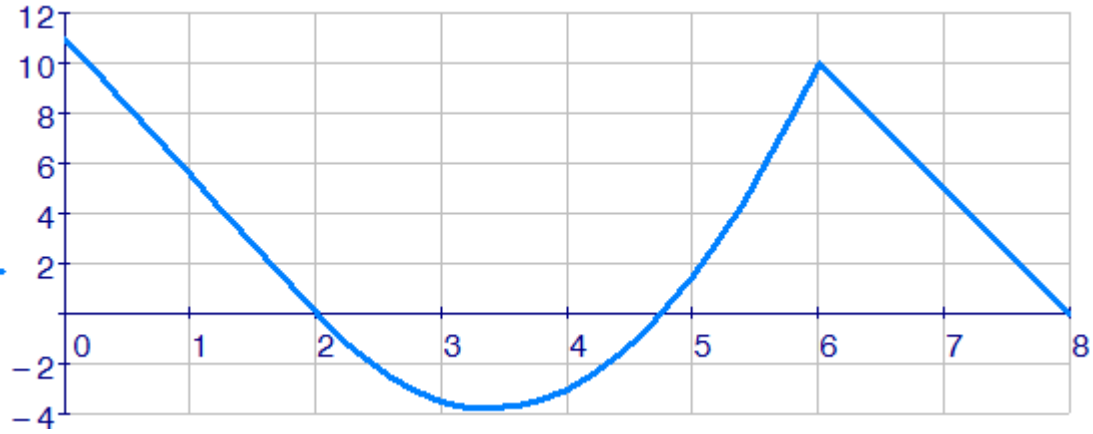
$X =$

	0
0	0
1	2
2	4
3	6
4	8

m



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



Równania MRS

$y_0 = 0 \quad \varphi_0 = 0 \quad y_3 = 0 \quad \alpha = 6.78472 \cdot \frac{1}{MN}$

$2\,y_1 = \alpha M_0$

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

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

$y =$

	0
0	0.00
1	-37.32
2	-28.84
3	0.00
4	-39.01

$\cdot mm$