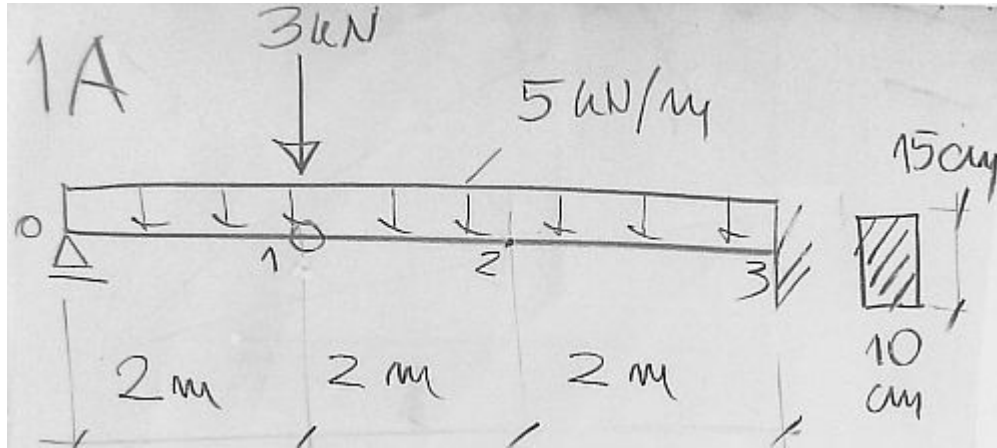


## Metoda różnic skończonych - ugięcie belki



$$P := 3\text{ kN} \quad q := 5 \frac{\text{kN}}{\text{m}} \quad E := 10\text{ GPa}$$

$$L := 6\text{ m} \quad b := 10\text{ cm} \quad h := 15\text{ cm} \quad J := b \cdot \frac{h^3}{12} = 2.8125 \times 10^3 \cdot \text{cm}^4$$

$$R_0 := \frac{q \cdot 2\text{ m}}{2} = 5 \cdot \text{kN}$$

$$n := 3 \quad \Delta := \frac{L}{n} = 2\text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 14.2222 \cdot \frac{1}{\text{MN}}$$

$$M_1(x) := R_0 \cdot x - q \cdot \frac{x^2}{2}$$

$$M_2(x) := M_1(x) - P \cdot (x - 2\text{ m})$$

$i := 0.. n$

$X_i := i \cdot \Delta$

$i := 0.. 1 \quad M_i := M1(X_i)$

$i := 2.. n \quad M_i := M2(X_i)$

M =		0	· kN · m	X =		0	m
	0	0			0	0	
	1	0			1	2	
	2	-26			2	4	
	3	-72			3	6	

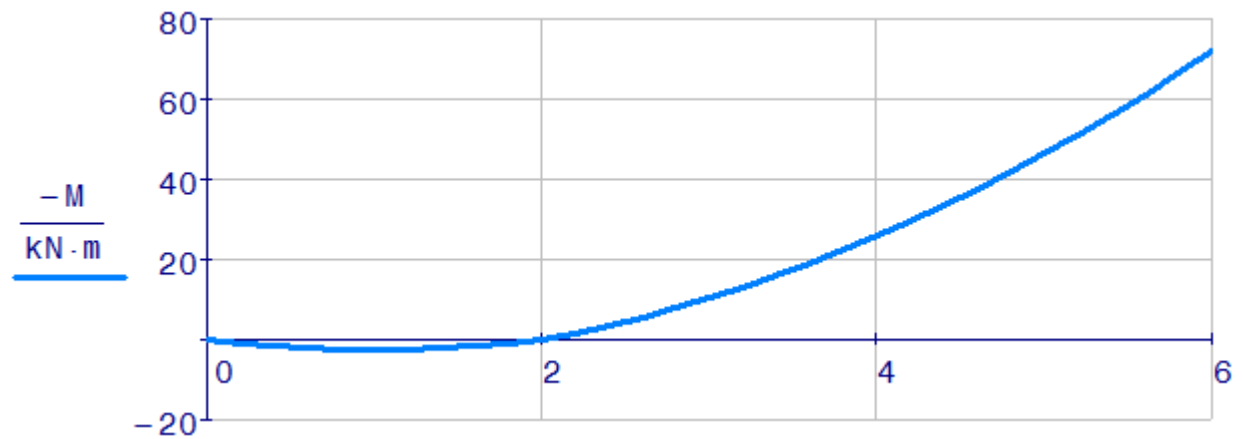
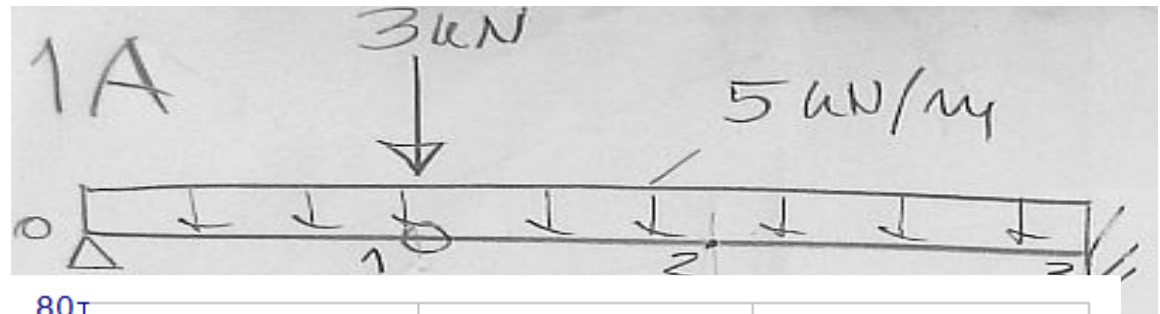
*Równania MRS*

$$y_0 = 0$$

$$y_3 = 0$$

$$\varphi_3 = 0$$

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



$$\alpha = 14.2222 \cdot \frac{1}{\text{MN}}$$

$$2\,y_2 = \alpha M_3$$

M =

	0
0	0
1	0
2	-26
3	-72

· kN · m

y =

	0
0	0.00
1	-1393.78
2	-512.00
3	0.00

· mm