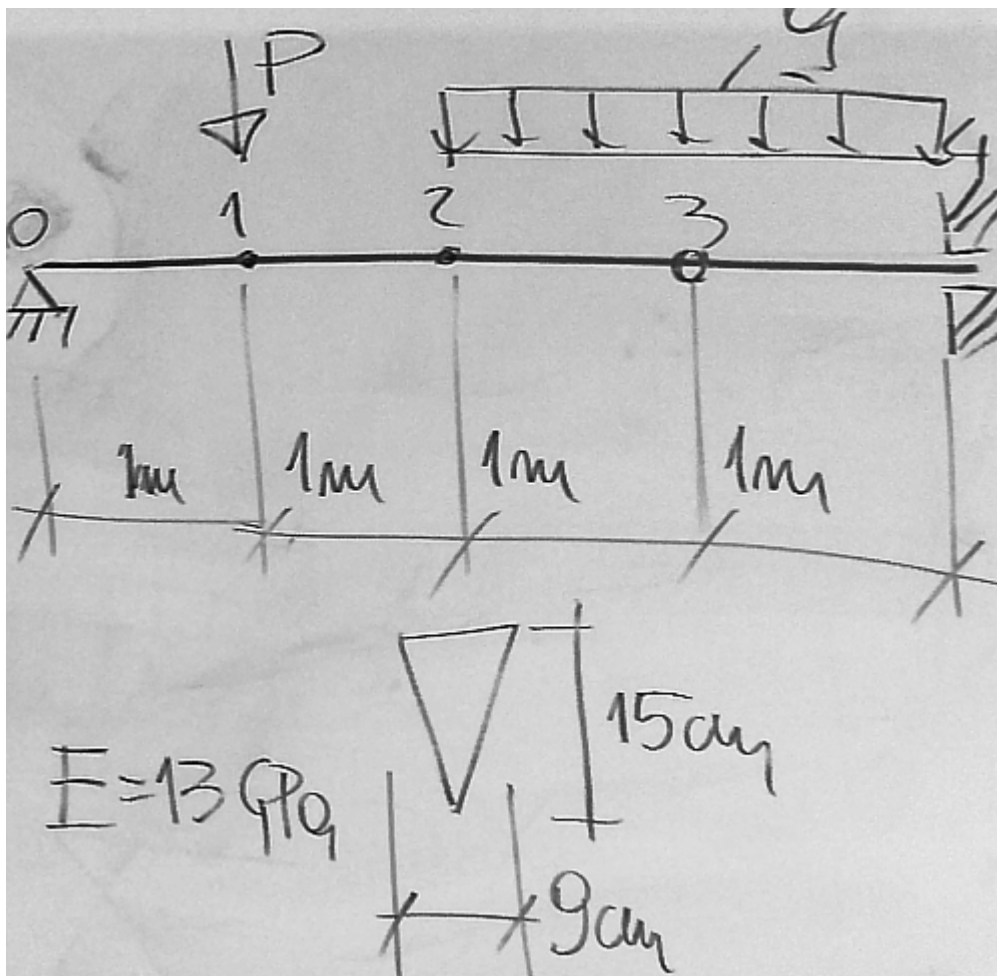


## Metoda różnic skończonych - ugięcie belki A2



$$P := 3\text{kN} \quad q := 2\text{kN/m}$$

$$b := 9\text{cm} \quad h := 15\text{cm}$$

$$L := 4\text{m} \quad J := \frac{bh^3}{12}$$

$$n := 4 \quad \Delta x := \frac{L}{n}$$

$$\alpha := \frac{\Delta x^2}{E \cdot J} = 9.1168 \times 10^{-10}$$

dokładność  $y \pm 0.000$

$$R_0 := \frac{P \cdot 2 + q \cdot 1\text{m} \cdot 0}{3}$$

$$M_1(x) := R_0 \cdot x \quad M_2(x) := M_1(x) - P \cdot (x - 1\text{m})$$

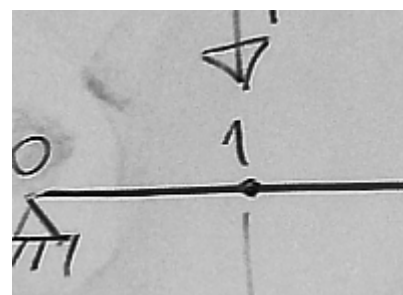
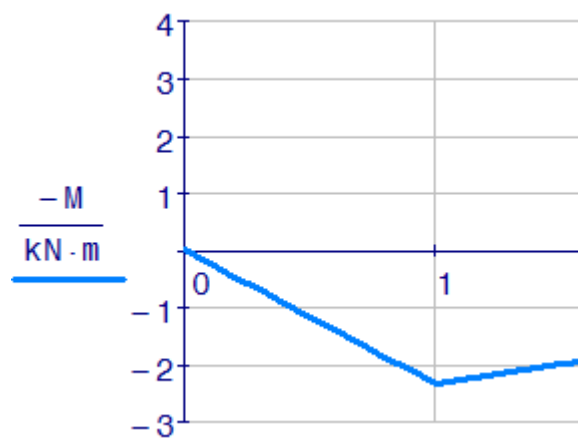
$$M_3(x) := M_2(x) - q \cdot \frac{(x - 2\text{m})^2}{2}$$

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

|   | 0      |
|---|--------|
| 0 | 0      |
| 1 | 2.333  |
| 2 | 1.667  |
| 3 | 0      |
| 4 | -3.667 |

$$\frac{X}{\text{m}} =$$

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



*Warunki brzegowe*

$$y_0 = 0 \quad y_4 = 0 \quad \varphi_4 = 0 \quad \text{-----} > \quad 2y_3 = \alpha M_4$$

*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       |
|---|---------|
| 0 | 0.000   |
| 1 | -24.818 |
| 2 | -28.363 |
| 3 | -16.714 |
| 4 | 0.000   |

· mm

$$\alpha = !$$