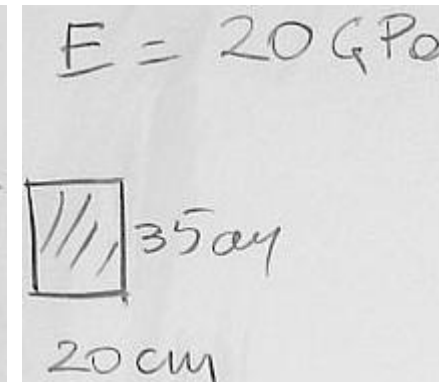
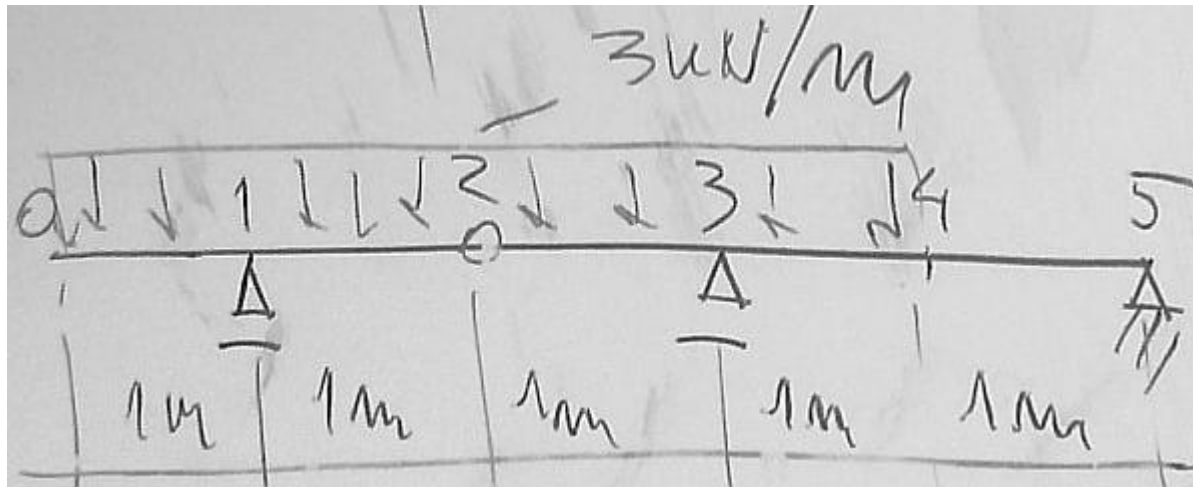


ORIGIN := 0



$$q := 3 \frac{\text{kN}}{\text{m}} \quad P := 0 \text{ kN}$$

$$\underline{L} := 5 \text{ m} \quad b := 20 \text{ cm} \quad h := 35 \text{ cm} \quad \underline{J} := b \cdot \frac{h^3}{12} \quad E := 20 \text{ GPa} \quad J = 71458.333 \cdot \text{cm}^4$$

$$R1 := q \cdot 2 \text{ m} \quad T2 := 0 \quad R3 := \frac{q \cdot 2 \text{ m} \cdot 2 \text{ m}}{2 \text{ m}} \quad R5 := 0$$

$$R1 = 6 \cdot \text{kN} \quad T2 = 0 \cdot \text{kN} \quad R3 = 6 \cdot \text{kN} \quad R5 = 0 \cdot \text{kN}$$

$$n := 5 \quad \Delta := \frac{L}{n} = 1 \text{ m} \quad \alpha := \frac{\Delta^2}{E \cdot J} \quad \alpha = 0.069971 \cdot \frac{1}{\text{MN}}$$

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

$$M2(x) := M1(x) + R1 \cdot (x - 1\text{m})$$

$$M3(x) := M2(x) + R3 \cdot (x - 3\text{m})$$

$$M4(x) := R5 \cdot (L - x)$$

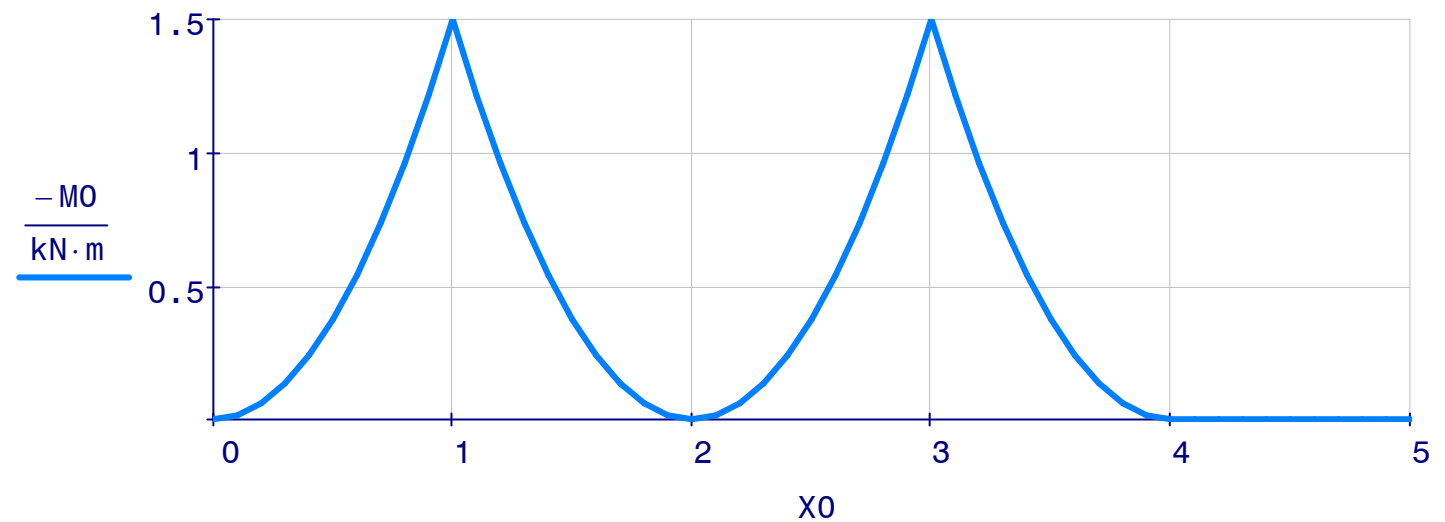
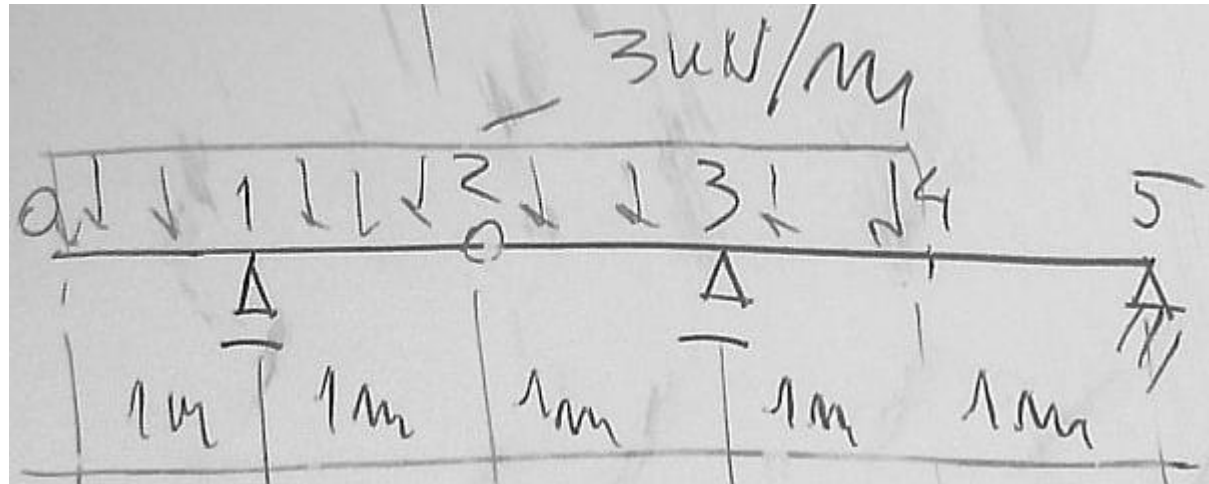
$$i := 0 \dots 10n \quad x0_i := i \cdot \frac{\Delta}{10}$$

$$i := 0 \dots 10 \quad M0_i := M1(x0_i)$$

$$i := 11 \dots 30 \quad M0_i := M2(x0_i)$$

$$i := 31 \dots 40 \quad M0_i := M3(x0_i)$$

$$i := 41 \dots 10n \quad M0_i := M4(x0_i)$$



$$i := 0 .. n \quad X_i := i \cdot \Delta$$

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

$$i := 2 .. 3 \quad M_i := M2(X_i)$$

$$i := 4 .. n \quad M_i := M4(X_i)$$

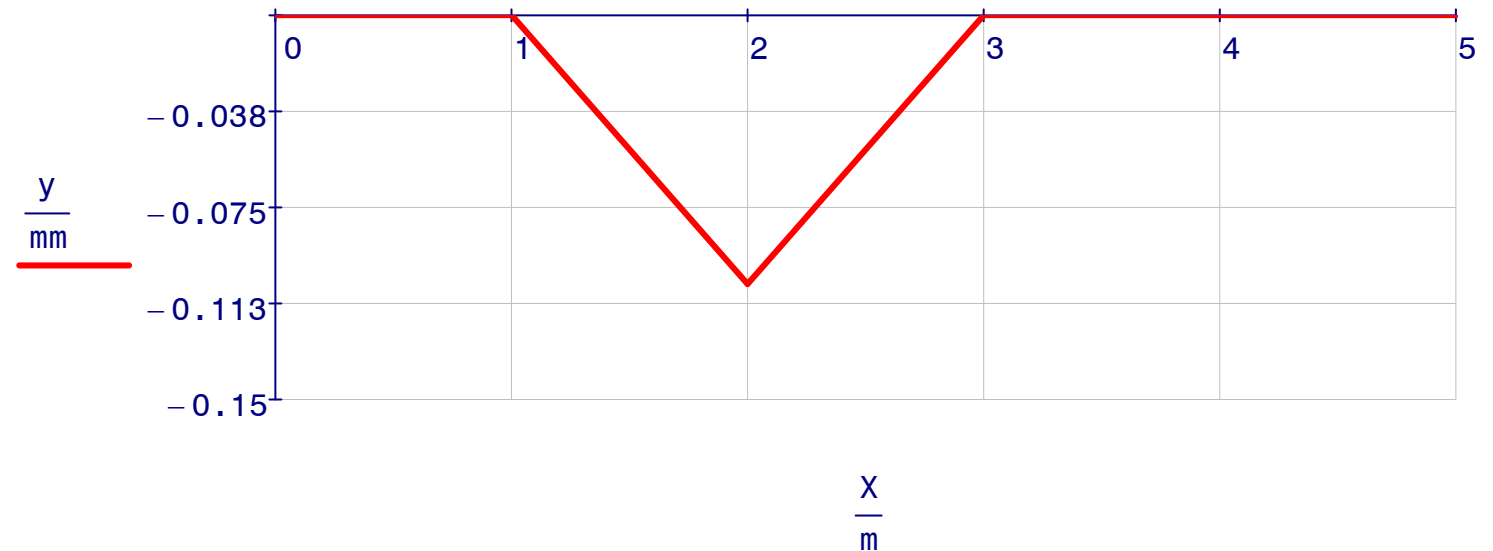
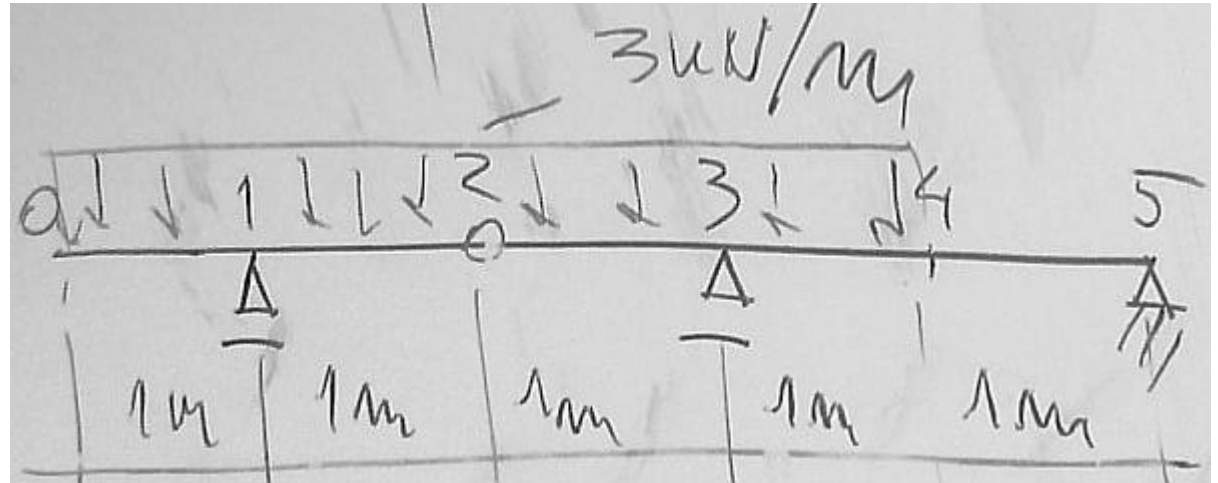
$$A := \begin{pmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & -2 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -2 & 1 & 0 \\ 0 & 0 & 0 & 1 & -2 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$y := \text{lsolve}(A, \alpha \cdot M)$$

$$y = \begin{pmatrix} 0 \\ 0 \\ -0.105 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot \text{mm}$$

Układ równań metody różnic skończonych

$$A \cdot y = \alpha \cdot M$$



```
i := 1 .. 49
```

```
A0i,i := -2    A0i,i-1 := 1    A0i,i+1 := 1    A050,50 := 1
```

```
i := 0 .. 50    A00,i := 0    A020,i := 0    A00,10 := 1    A020,30 := 1
```

```
y0 := lsolve(A0,  $\frac{\alpha}{10} \cdot M0$ )
```

