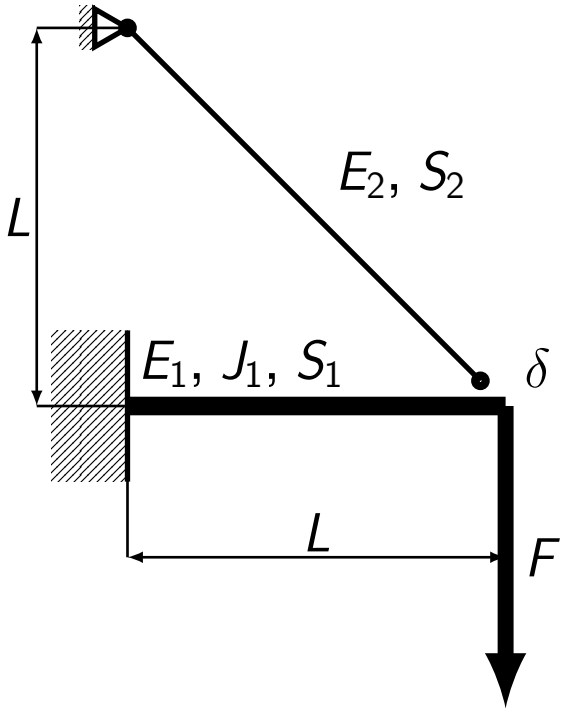
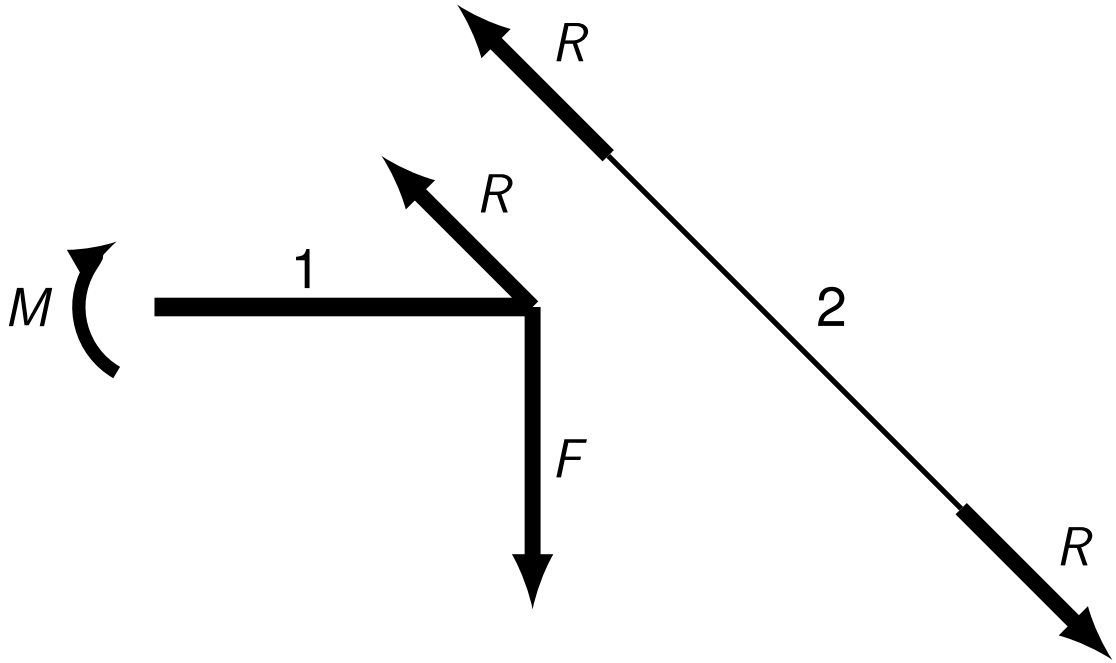
Příklad:

Dáno: E_1, E_2, J_1, S_1, S_2.
Určete ohybový moment ve vetknutí.



Řešení:



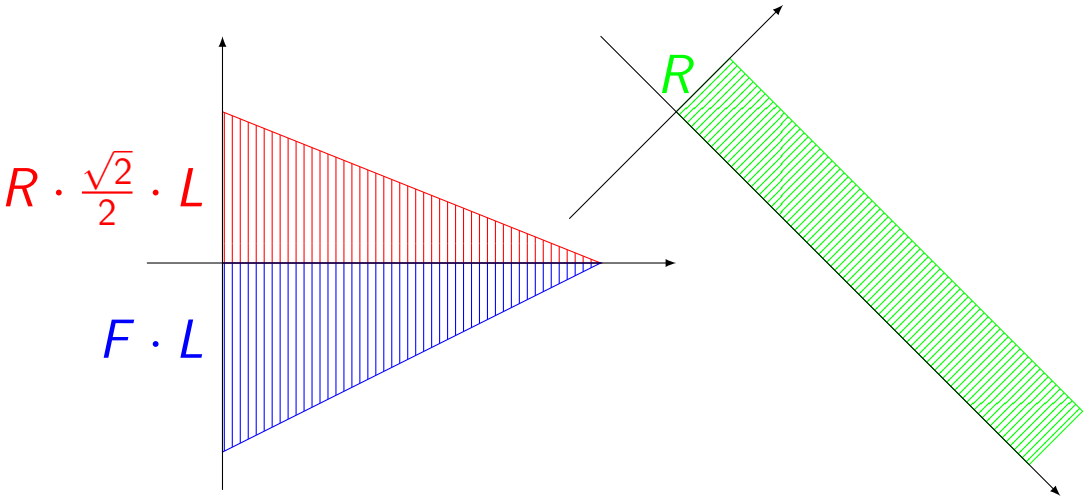
Rovnováha sil:

$$N_1 = -R \cdot \frac{\sqrt{2}}{2}$$

$$\frac{M}{L} = -F + R \cdot \frac{\sqrt{2}}{2}$$

$$N_2 = R$$

Řešení:



$$N_1 = -R \cdot \frac{\sqrt{2}}{2}$$

$$M_1 = R \cdot \frac{\sqrt{2}}{2} \cdot x - F \cdot x$$

$$N_2 = R$$

$$n_1 = \frac{\partial N_1}{\partial R} = -\frac{\sqrt{2}}{2}$$

$$m_1 = \frac{\partial M_1}{\partial R} = \frac{\sqrt{2}}{2} \cdot x$$

$$n_2 = 1$$

Řešení:

deformační podmínka:

$$\frac{\partial U}{\partial R} = \delta$$

$$\int_0^L \frac{N_1 \cdot n_1}{E_1 \cdot S_1} \cdot dx + \int_0^L \frac{M_1 \cdot m_1}{E_1 \cdot J_1} \cdot dx + \int_0^{L \cdot \sqrt{2}} \frac{N_2 \cdot n_2}{E_2 \cdot S_2} \cdot dx = \delta$$

$$\frac{L \cdot R}{2 \cdot E_1 \cdot S_1} + \frac{L^3 \cdot R - \sqrt{2} \cdot F \cdot L^3}{6 \cdot E_1 \cdot J_1} + \frac{\sqrt{2} \cdot L \cdot R}{E_2 \cdot S_2} = \delta$$

$$R = \frac{\left(\sqrt{2} \cdot E_2 \cdot F \cdot L^3 + 6 \cdot \delta \cdot E_1 \cdot E_2 \cdot J_1\right) \cdot S_1 \cdot S_2}{\left(E_2 \cdot L^3 \cdot S_1 + 3 \cdot E_2 \cdot J_1 \cdot L\right) \cdot S_2 + 3 \cdot 2^{\frac{3}{2}} \cdot E_1 \cdot J_1 \cdot L \cdot S_1}$$

$$M = L \cdot \left(-F + R \cdot \frac{\sqrt{2}}{2}\right)$$