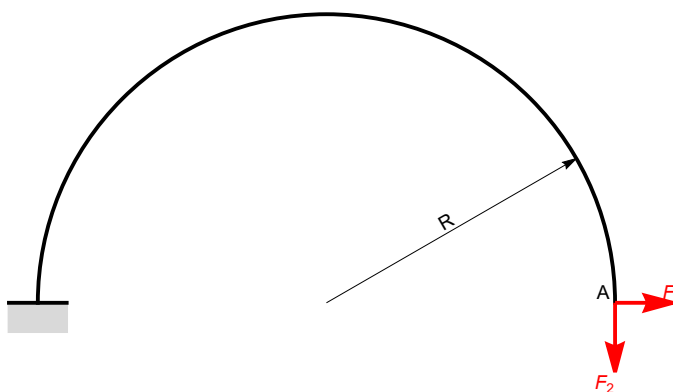


# Půloblouk se dvěma silami

## Zadání



Dáno:

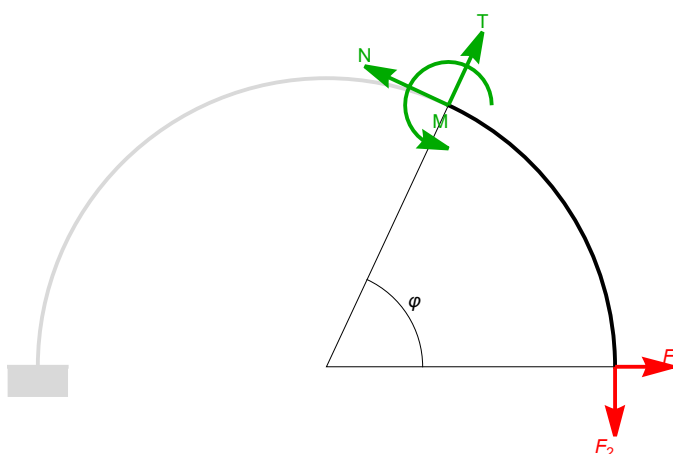
$R, E, J, F_1, F_2$

Určete:

svislý a vodorovný posuv bodu A

## Řešení

Vnitřní ohybový moment



$$M = -R \sin[\varphi] F_1 + R (1 - \cos[\varphi]) F_2.$$

(1)

## Deformační energie

$$U = \int_0^1 \frac{M^2}{2 E J} dl = \int_0^\pi \frac{M^2 R}{2 E J} d\varphi, \quad (2)$$

$$U = \frac{R^3 (\pi F_1^2 - 8 F_1 F_2 + 3 \pi F_2^2)}{4 E J}. \quad (3)$$

## Posuvy

$$u_A = \frac{\partial U}{\partial F_1} = \frac{R^3 (\pi F_1 - 4 F_2)}{2 E J}, \quad (4)$$

$$v_A = \frac{\partial U}{\partial F_2} = \frac{R^3 (-8 F_1 + 6 \pi F_2)}{4 E J}. \quad (5)$$