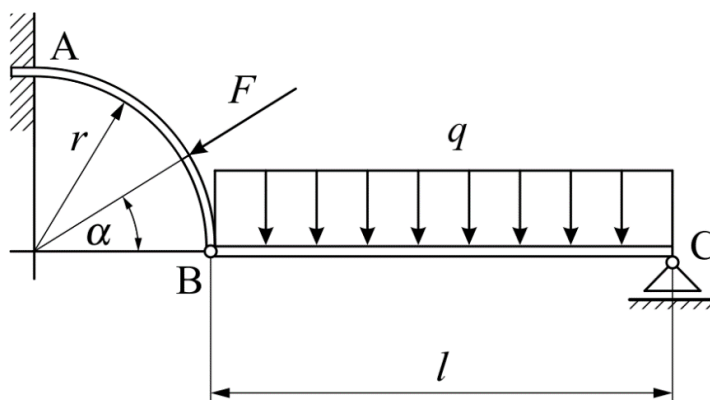


Určete reakce soustavy těles a vnitřní statické účinky v křivém prutu. Dáno:  $F, \alpha, q, r, l$



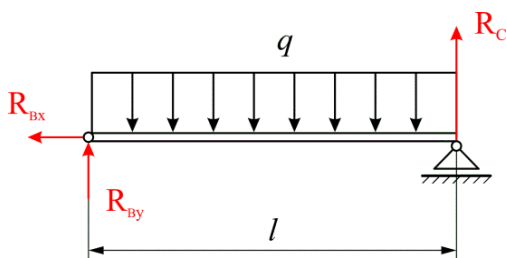
Obr.1

Výpočet stupňů volnosti:

$$n = 3, r = 1, o = 1, t = 1$$

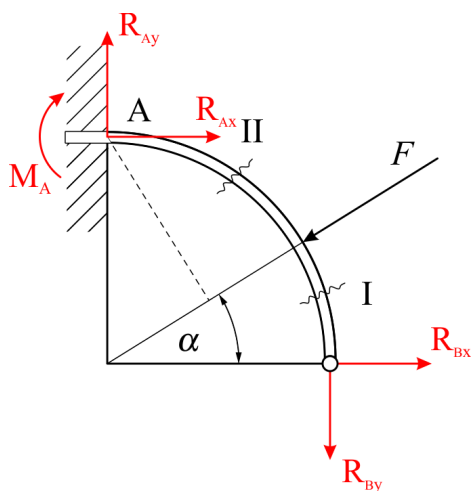
$$i = 3(3 - 1) - 2 \cdot 1 - 1 \cdot 1 - 3 \cdot 1 = 0$$

Výpočet reakcí:



Obr.2

1.  $R_{Bx} = 0$
2.  $R_{By} + R_C - ql = 0$
3.  $R_C \cdot l - \frac{ql^2}{2} = 0$



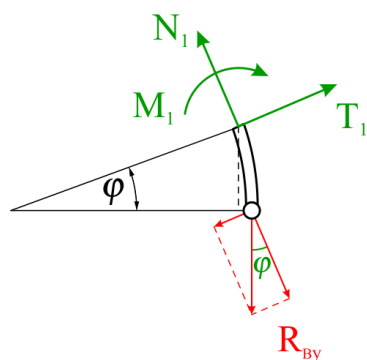
Obr.3

4.  $R_{Ax} + R_{Bx} - F \cos \alpha = 0$
5.  $R_{Ay} - R_{By} - F \sin \alpha = 0$
6.  $M_A + R_{Ax} \cdot r + R_{By} \cdot r = 0$

Z rovnic 1 až 6 vypočteme:

$$\begin{aligned} R_{Bx} &= 0 & R_{Ax} &= F \cos \alpha \\ R_{By} &= \frac{ql}{2} & R_{Ay} &= \frac{ql}{2} + F \sin \alpha \\ R_C &= \frac{ql}{2} & M_A &= -\frac{ql}{2} \cdot r - F r \cos \alpha \end{aligned}$$

Vnitřní statické účinky v řezu I:



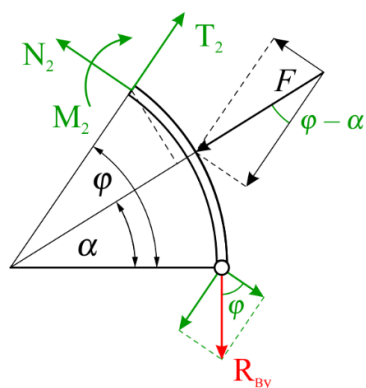
$$\varphi \in \langle 0; \alpha \rangle$$

$$\begin{aligned} N_1 - R_{By} \cos \varphi &= 0 \\ T_1 - R_{By} \sin \varphi &= 0 \\ M_1 + R_{By} r (1 - \cos \varphi) &= 0 \end{aligned}$$

Obr. 4

Vnitřní statické účinky v řezu II:

$$\varphi \in \langle \alpha; \frac{\pi}{2} \rangle$$



$$\begin{aligned} N_2 - R_{By} \cos \varphi + F \sin(\varphi - \alpha) &= 0 \\ T_2 - R_{By} \sin \varphi - F \cos(\varphi - \alpha) &= 0 \\ M_2 + R_{By} \cdot r (1 - \cos \varphi) + F r \sin(\varphi - \alpha) &= 0 \end{aligned}$$

Obr. 5