

3.3. Potrebno je dimenzionirati štap okruglog poprečnog presjeka koji je zglobno pričvršćen ako je poznato:

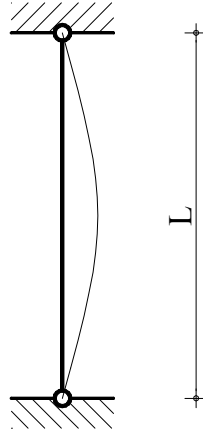
$$L = 2.8\text{m}$$

$$E = 1.6 \cdot 10^4 \frac{\text{kN}}{\text{cm}^2}$$

$$P = 180\text{kN}$$

$$\sigma_p = 25.0 \frac{\text{kN}}{\text{cm}^2}$$

$$v = 6.0$$



$$L_i = L = 2.8\text{m}$$

Karakteristike poprečnog presjeka

$$I_{\min} = \frac{\pi \cdot D^4}{64}$$

Dopuštena i kritična sila

$$P = 180\text{kN} \leq P_{\text{dop}} = \frac{P_{\text{kr}}}{v} \Rightarrow P_{\text{kr}} \geq 1080\text{kN}$$

$$P_{\text{kr}} = \frac{\pi^2 \cdot E \cdot I_{\min}}{L_i^2} \geq 1080\text{kN}$$

$$I_{\min} = \frac{\pi \cdot D^4}{64} \geq \frac{L_i^2}{\pi^2 \cdot E} 1080\text{kN}$$

$$D^4 \geq \frac{64 L_i^2}{\pi^3 \cdot E} 1080\text{kN}$$

$$D^4 \geq 10995.11\text{cm}^4$$

$$D \geq 10.24\text{cm}$$