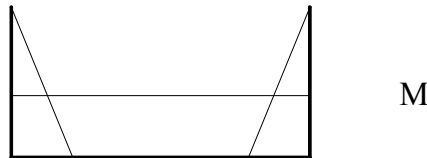
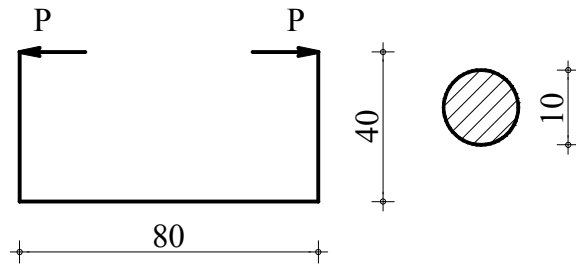


2.4. Potrebno je odrediti silu P s kojom se može opteretiti prikazana konstrukcija ako je poznato dopušteno opterećenje

$$\sigma_{\text{dop}} = 12 \frac{\text{kN}}{\text{cm}^2}$$



$$M_{\text{max}} = P \cdot 40\text{cm}$$

$$N_{\text{max}} = P$$

a)

$$\sigma_{\text{max}} = \frac{N}{A} + \frac{M}{W} = \frac{P}{\frac{d^2\pi}{4}} + \frac{P \cdot 40\text{cm}}{\frac{d^3\pi}{32}}$$

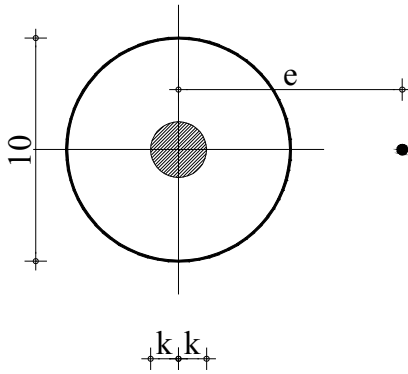
$$\sigma_{\text{max}} = P \left(\frac{4}{d^2\pi} + \frac{32 \cdot 40\text{cm}}{d^3\pi} \right)$$

$$\sigma_{\text{max}} = P \frac{4d + 1280}{d^3\pi} \leq \sigma_{\text{dop}}$$

$$P \leq \sigma_{\text{dop}} \frac{d^3\pi}{4d + 1280\text{cm}} = 12 \frac{\text{kN}}{\text{cm}^2} \cdot \frac{10^3 \text{cm}^3 \cdot \pi}{4 \cdot 10\text{cm} + 1280\text{cm}}$$

$$P \leq 28.56\text{kN}$$

b)



$$k = \frac{d}{8} = \frac{10\text{cm}}{8} = 1.25\text{cm}$$

$$e = \frac{M}{N} = 40\text{cm}$$

$$\sigma_{\max} = \frac{N}{A} \left(1 + \frac{e}{k}\right) \leq \sigma_{\text{dop}}$$

$$P \leq \frac{\sigma_{\text{dop}} \cdot A}{1 + \frac{e}{k}} = \frac{12 \frac{\text{kN}}{\text{cm}^2} \cdot \frac{10^2 \pi}{4} \text{cm}^2}{1 + \frac{40\text{cm}}{1.25\text{cm}}} = 28.56\text{kN}$$