

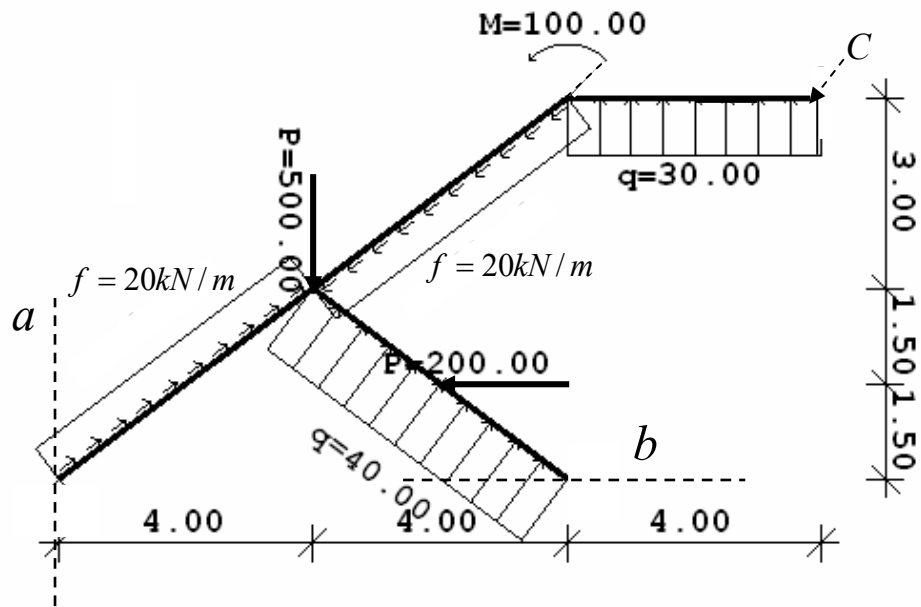
TEHNIČKA MEHANIKA

21. 9. 2006.

grupa **A**

(ime i prezime ; matični broj)

- 1.) Zadani sustav u ravнини uravnotežiti silama na pravcima "a", "b" te momentom u točki C. (15 bodova)

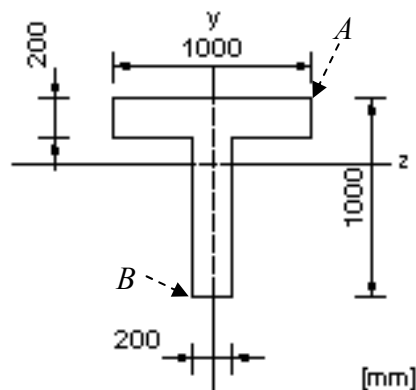


(dimenzije u metrima)

- 2.) Za uravnoteženi sustav iz prvog zadatka izračunati i nacrtati dijagrame unutarnjih sila. (55 bodova; $M=30$; konstrukcija parabola 5; T dijagram 10 ; N dijagram 10)

3.)

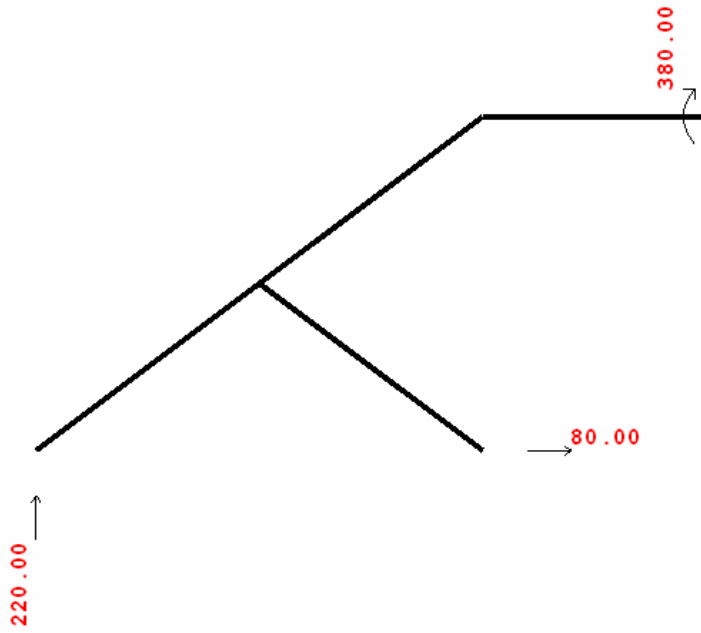
Ako u točki B djeluje tlačno naprežanje $\sigma_B = -900 \text{ kN/m}^2$, odredite koliko iznosi sila u točki A koja uzrokuje to naprežanje. (30 bodova)



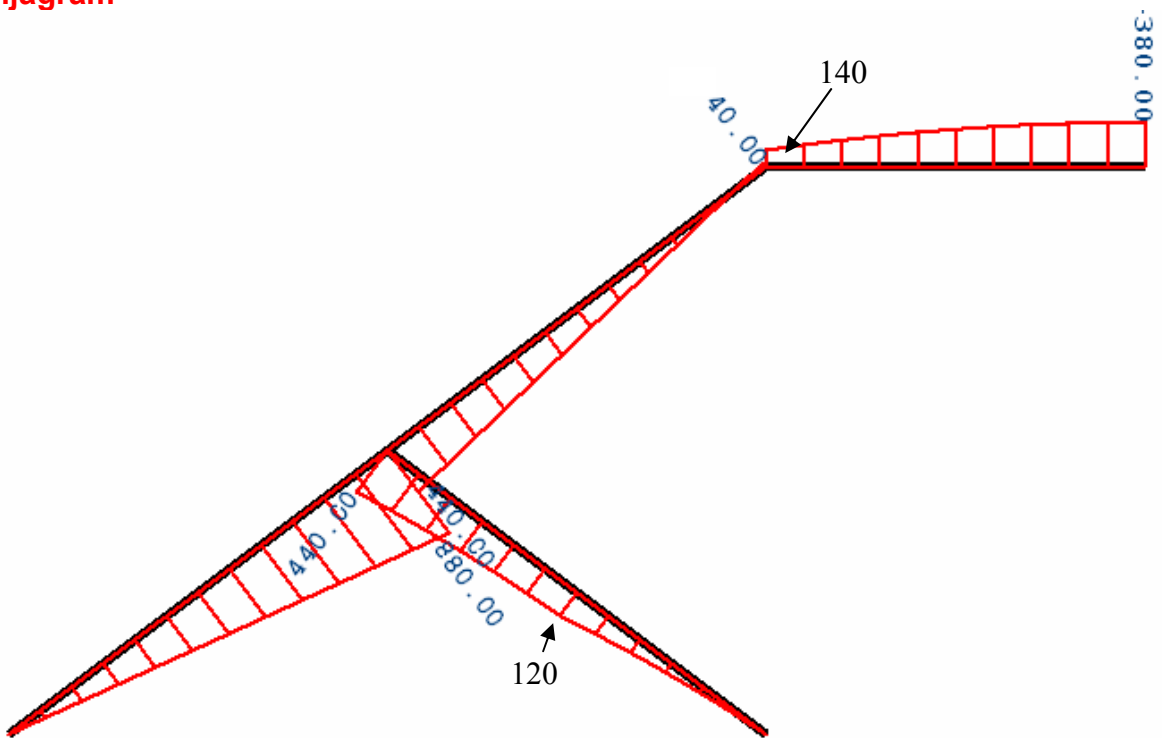
NAPOMENA: Za izlazak na usmeni dio ispita, na pismenom dijelu ispita treba sakupiti najmanje 50 bodova, ali pod uvjetom da je M dijagram u 2. zadatku dobar.

RJEŠENJA 21. 9. 2006.

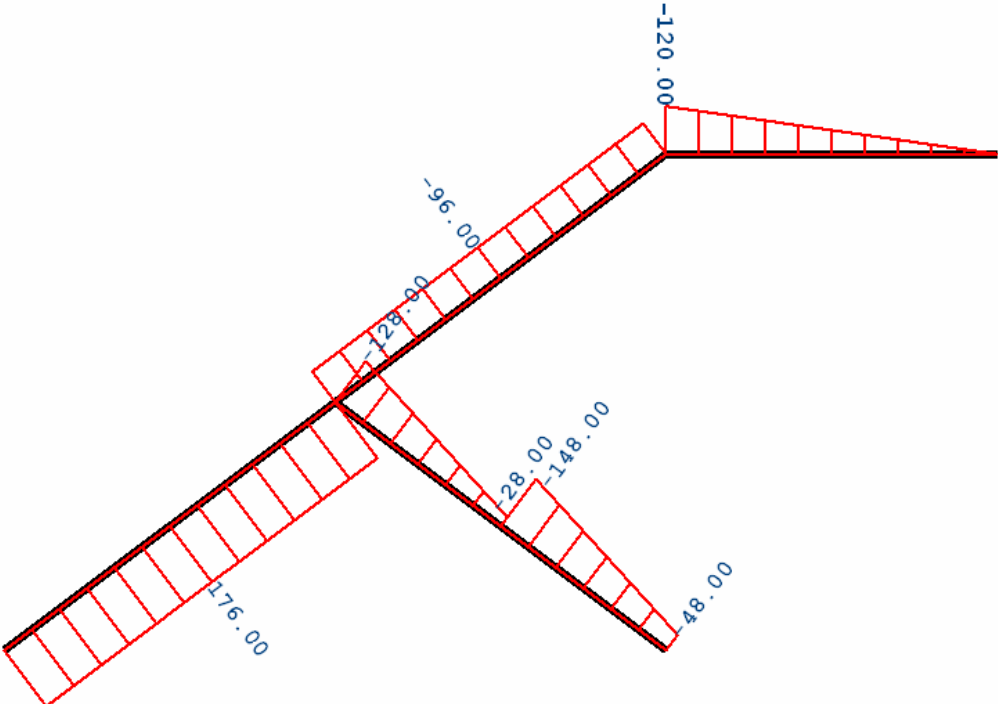
Reakcije



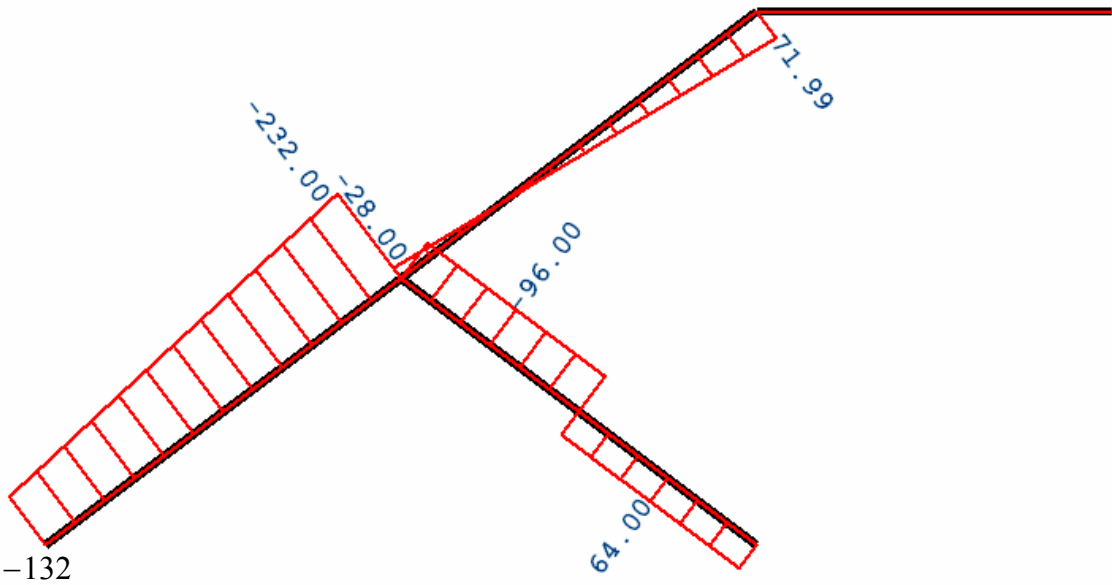
M dijagram



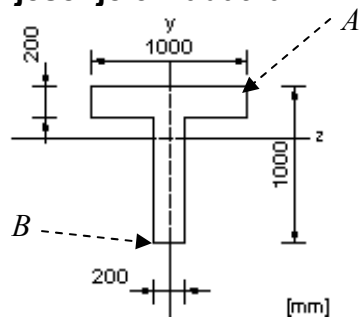
T diagram



N diagram



rješenje 3. zadatka



$$Y_T = 677.8 \text{ mm} = 0.68 \text{ m} = Y_B$$

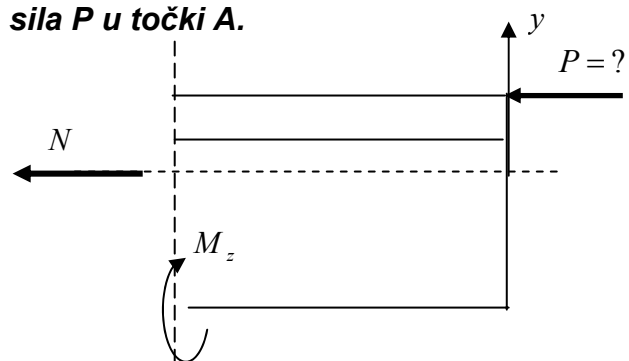
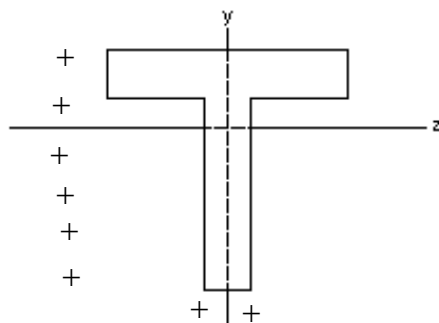
$$Y_A = 322.2 \text{ mm} = 0.32 \text{ m}$$

$$F = 0.36 \text{ m}^2$$

$$I_z = 3.14 \cdot 10^{-2} \text{ m}^4 = 0.0314 \text{ m}^4$$

$$I_y = 1.72 \cdot 10^{-2} \text{ m}^4 = 0.0172 \text{ m}^4$$

Pretpostavimo da djeluje tlačna sila P u točki A .

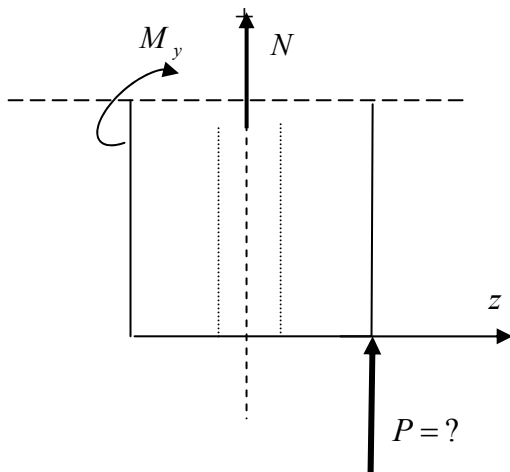


$$\sum X = 0; -N - P = 0; N = -PkN$$

$$\sum M_z = 0; -M_z + P \cdot y_A = 0; M_z = P \cdot 0.32 \text{ kNm}$$

$$\sum M_y = 0; -M_y + P \cdot z_A = 0; M_y = P \cdot 0.5 \text{ kNm}$$

$$\sigma_B = \pm \frac{N}{F} \pm \frac{M_z}{I_z} y_B + \frac{M_y}{I_y} z_B$$



$$-900 = -\frac{P}{0.36} + \frac{0.32P}{0.0314} \cdot 0.68 + \frac{0.50P}{0.0172} \cdot 0.1 =$$

$$-900 = (-2.78 + 6.93 + 2.90)P$$

$$-900 = 7.05P$$

$$P = \frac{-900}{7.05} = -127.7 \text{ kN}$$

U točki A djeluje **vlačna** sila intenziteta 127.7 kN .