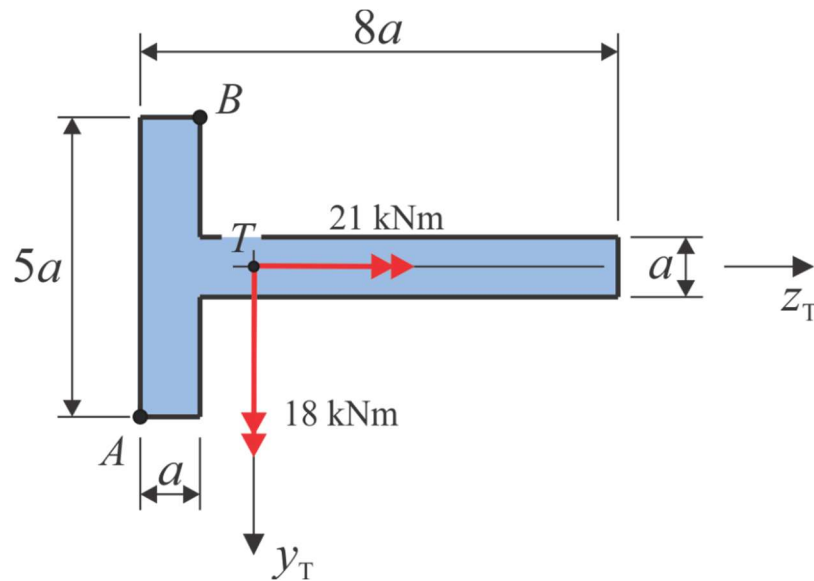


### Dodatna naloga 5

Določite lego nevtralne osi in izračunajte upogibno napetost v točkah A in B ( $a = 35 \text{ mm}$ ).



Rešitev:

- izračunamo težiščne vztrajnostne momente prereza:

$$I_{y_T} = \frac{227}{3} \cdot a^4 = 11354,7 \cdot 10^4 \text{ mm}^4$$

$$I_{z_T} = 11 \cdot a^4 = 1650,7 \cdot 10^4 \text{ mm}^4$$

$$I_{y_T z_T} = 0$$

- ugotovimo:

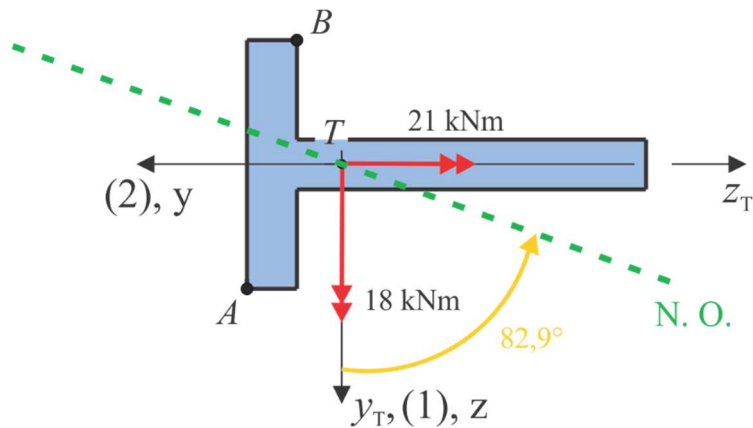
$$I_1 = I_{y_T} = 11354,7 \cdot 10^4 \text{ mm}^4$$

$$I_2 = I_{z_T} = 1650,7 \cdot 10^4 \text{ mm}^4$$

$$M_1 = -18 \text{ kNm}$$

$$M_2 = 21 \text{ kNm}$$

$$\tan \beta = \frac{I_1 M_2}{I_2 M_1} = -8,028 \Rightarrow \beta = -82,9^\circ$$



- koordinate točk A in B v koordinatnem sistemu glavnih vztrajnostnih osi so:

$$y_A = 99,17 \text{ mm} \quad z_A = 87,5 \text{ mm}$$

$$y_B = 64,17 \text{ mm} \quad z_B = -87,5 \text{ mm}$$

- izračunamo upogibne napetosti v točkah A in B:

$$\sigma_{xx,A} = \frac{M_1}{I_1} y_A - \frac{M_2}{I_2} z_A = -127 \text{ MPa}$$

$$\sigma_{xx,B} = \frac{M_1}{I_1} y_B - \frac{M_2}{I_2} z_B = 101 \text{ MPa}$$