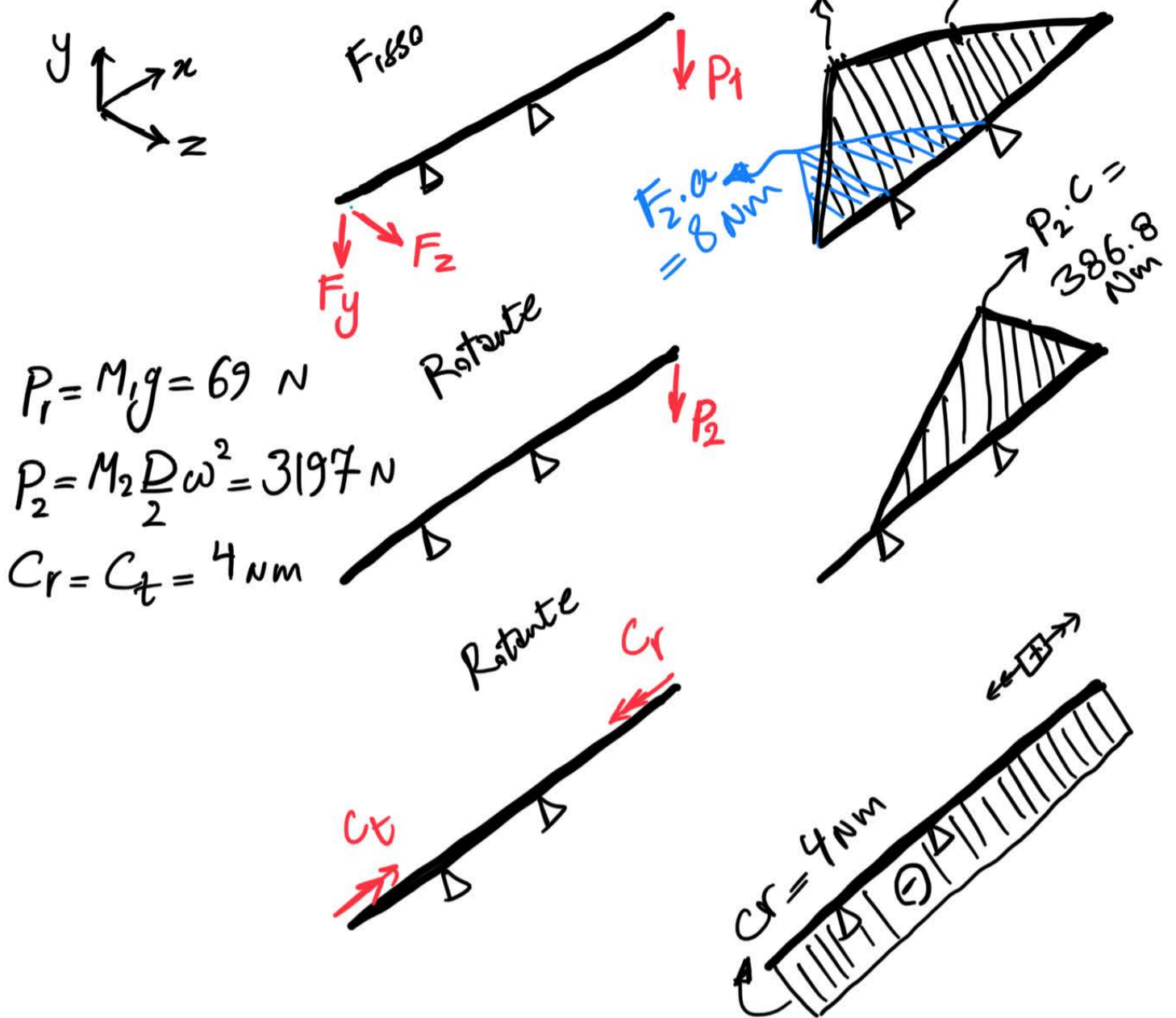


Esercizio 4



Verifica Statica (B-B)

$$M_{F, \max}^B = M_{F, \text{alt}}^B + M_{F, \text{med}}^B = 391.9 \text{ Nm}$$

$$\sigma^B = \frac{32 \cdot M_{F, \max}^B}{\pi d^3} = 499 \text{ MPa} \quad \tau_B = \frac{16 C_t}{\pi d^3} = 3 \text{ MPa}$$

$$\sigma_{VM}^* = \sqrt{(K_{tf} \cdot \sigma^B)^2 + 3(K_{tt} \tau^B)^2} = 898 \text{ MPa} \rightarrow y = 0.67 \quad \times$$

Verifica a Fatica (A-A)

$$M_{F, \text{alt}}^A = \sqrt{M_{F, Fy}^A{}^2 + M_{F, z}^A{}^2} = \sqrt{40^2 + 8^2} = 40.79 \text{ Nm}$$

$$\sigma_a = 52 \text{ MPa} \quad M_{F, \text{med}}^A = 0 \rightarrow \sigma_m = 0$$

$$\tau_m = 3 \text{ MPa} \quad b_2 = b_3 = 0.9 \quad q = 0.9$$

$$\sigma'_{FAF} = \frac{0.5 UTS b_2 b_3}{1 + 0.9(1.8-1)} = 188 \text{ MPa}$$

CONSIDERANDO

$$\tau_m \approx \phi$$

$$y = \frac{188}{52} = 3.63 \quad \checkmark$$

CONSIDERANDO ANCHE Z_m :

$$\sigma_{GR} = \sqrt{P_w^2 + \left(\frac{P'_{f_{a, \bar{r}}}}{Z_{lim}} \right)^2 \cdot Z_m^2} = 52 \text{ TRa}$$

$$y = \frac{P'_{ref}}{P_{at}} = 3.63 \checkmark$$