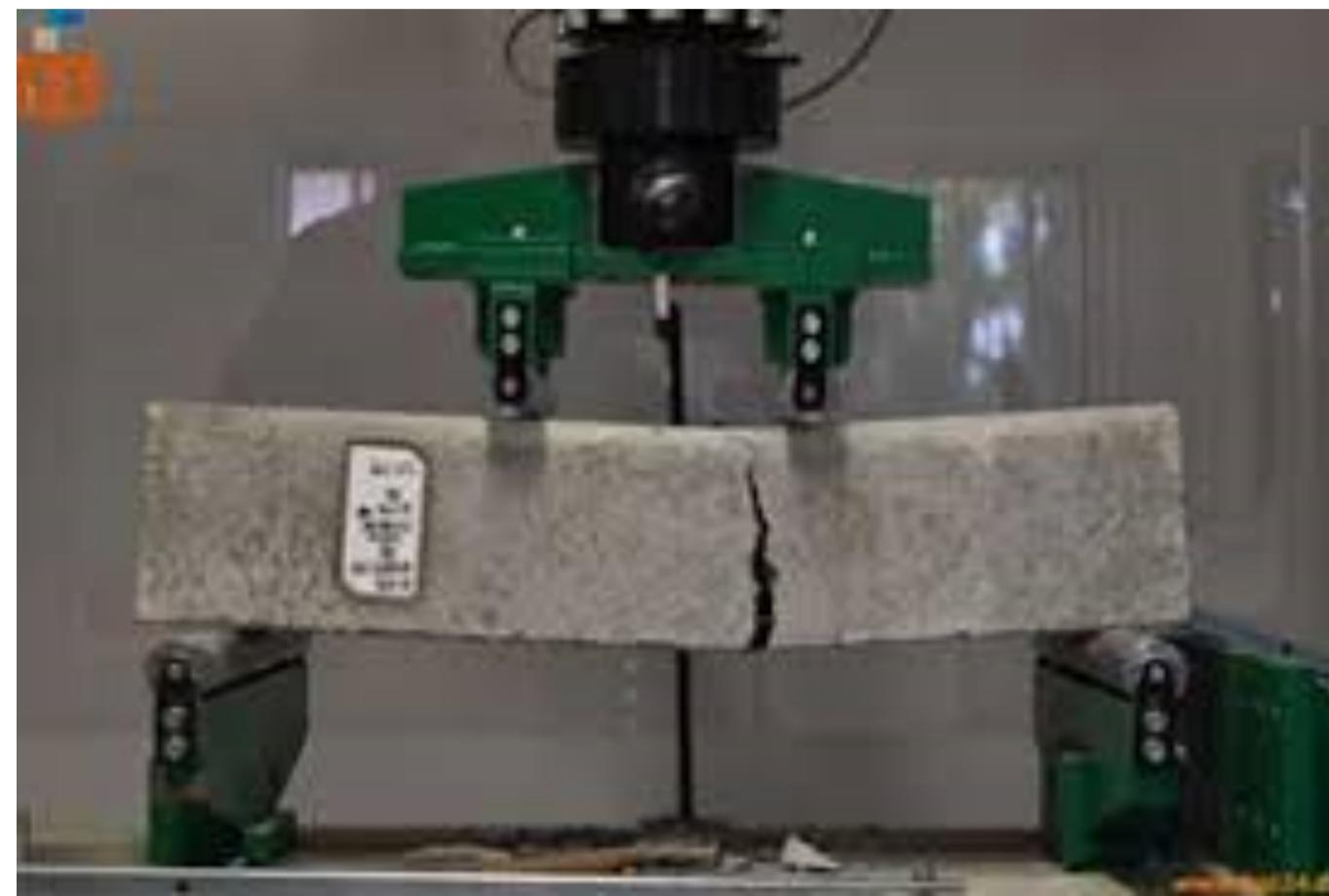
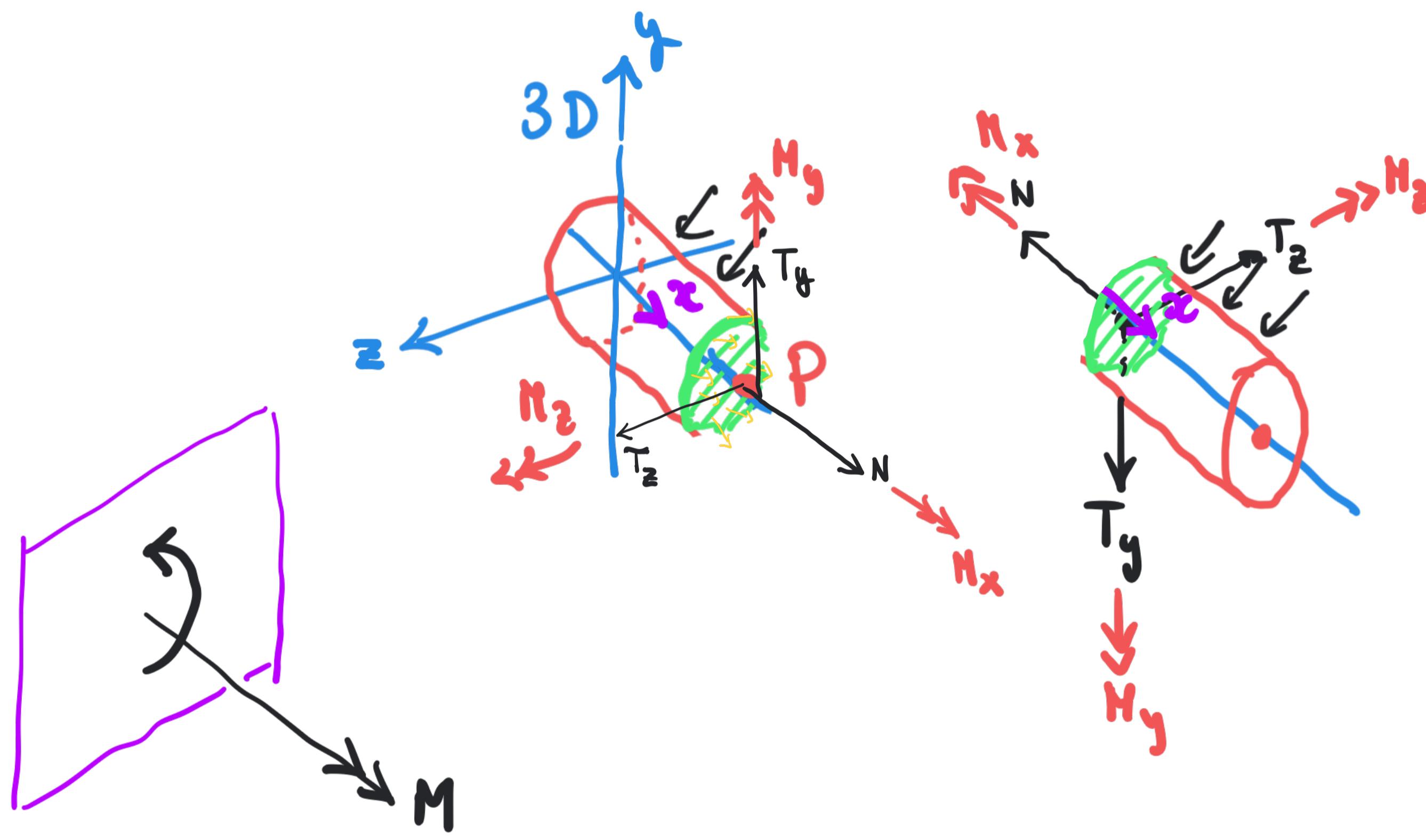


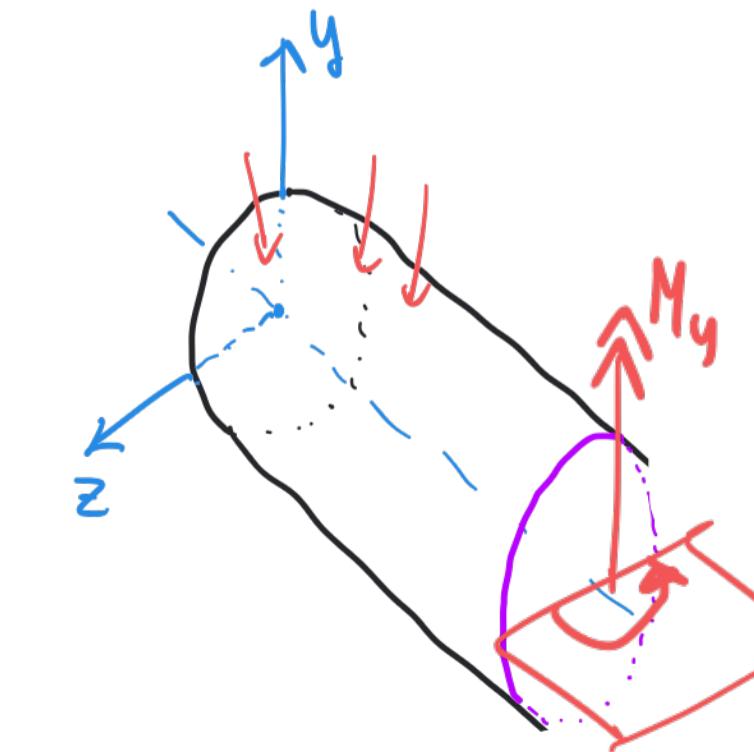
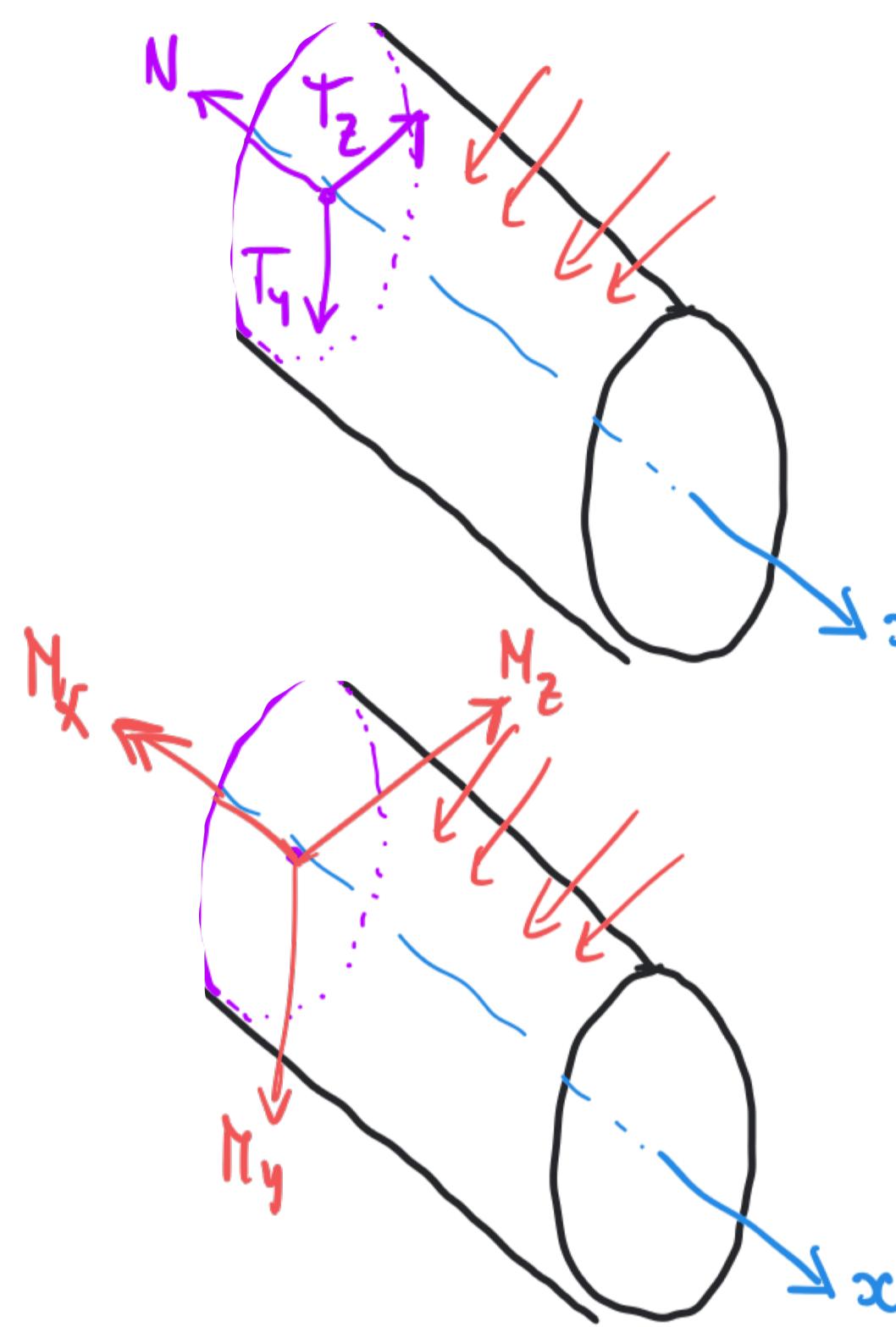
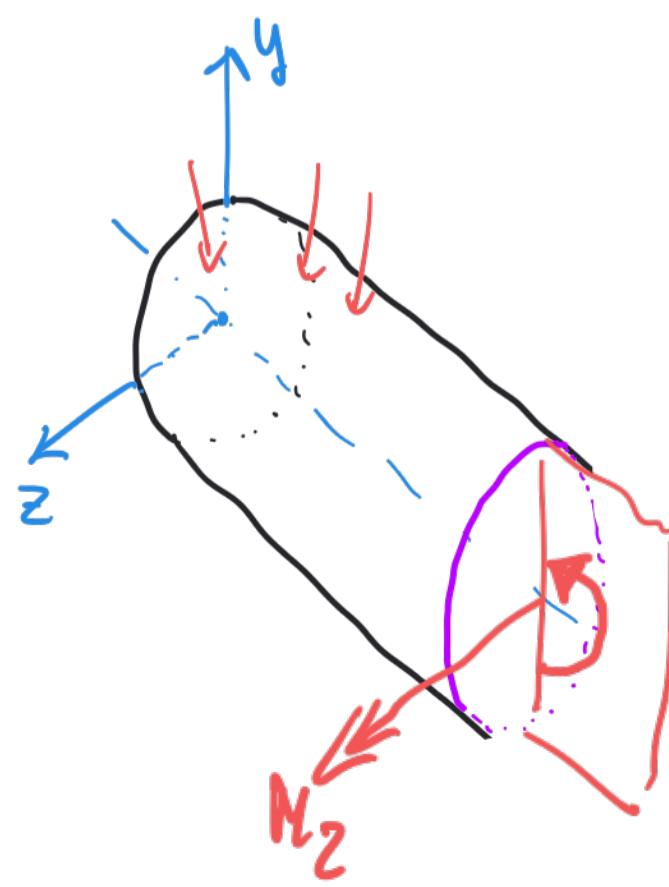
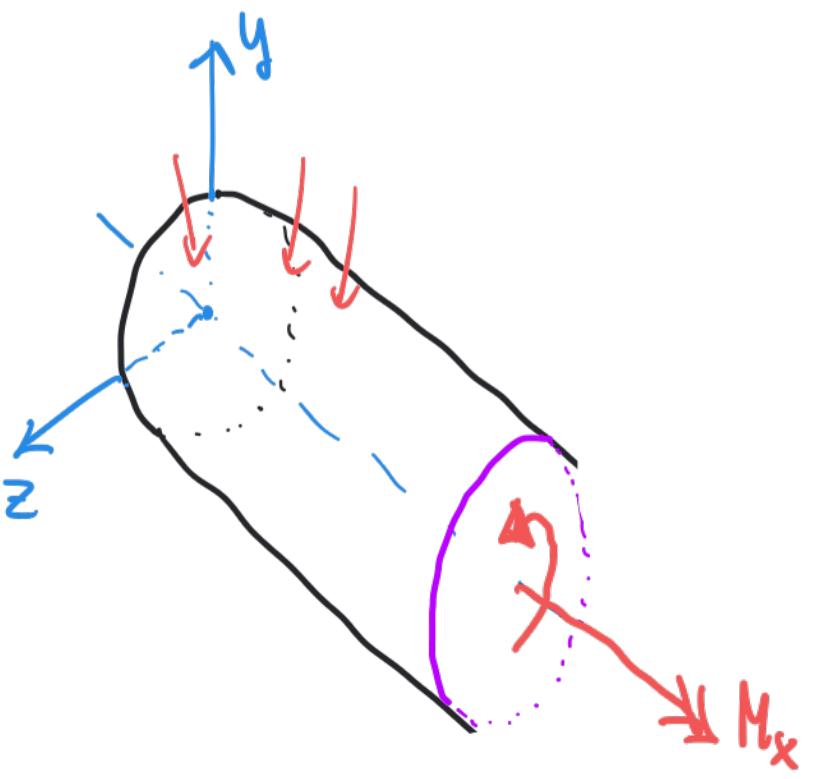
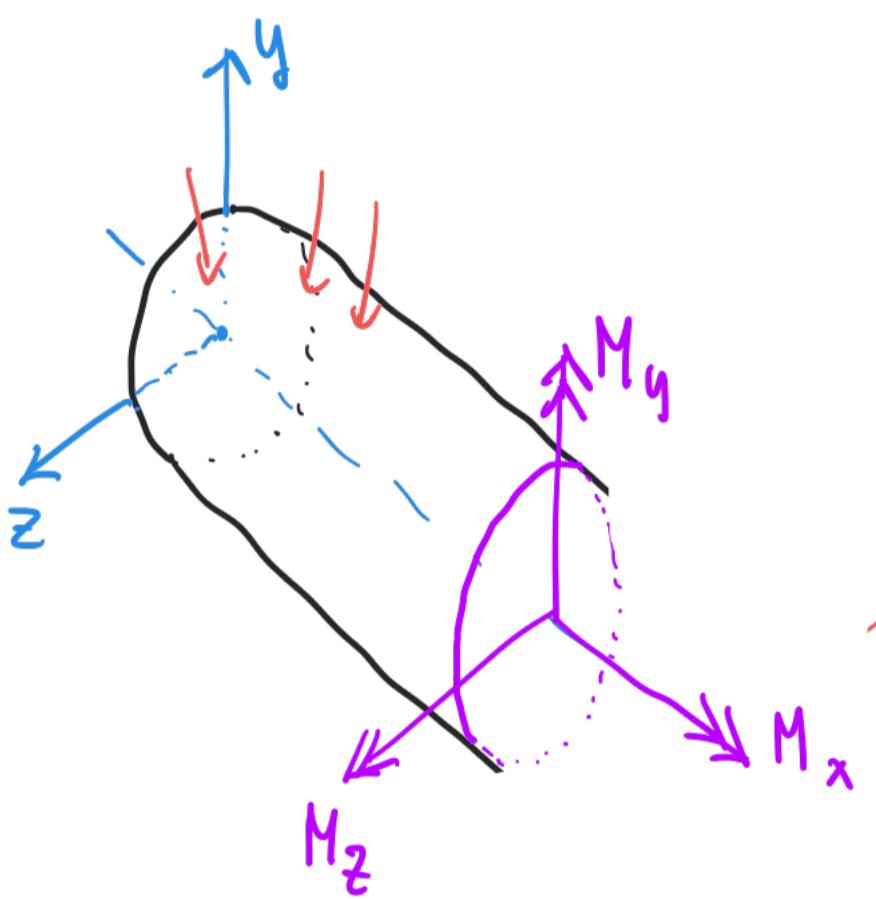
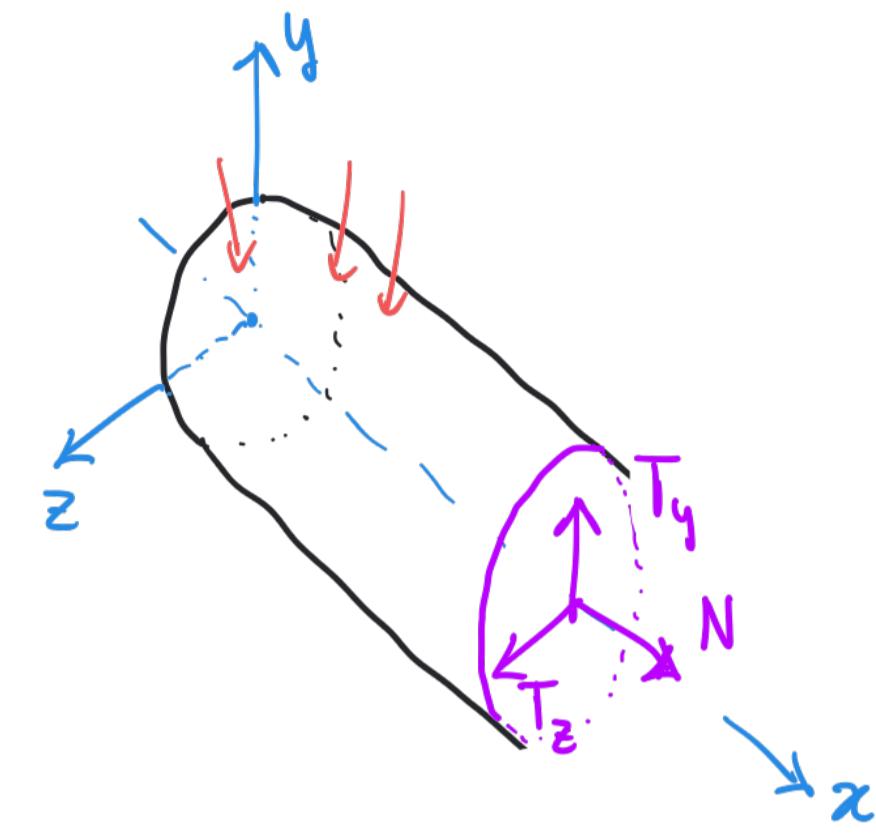
SOLLECITAZIONI INTERNE

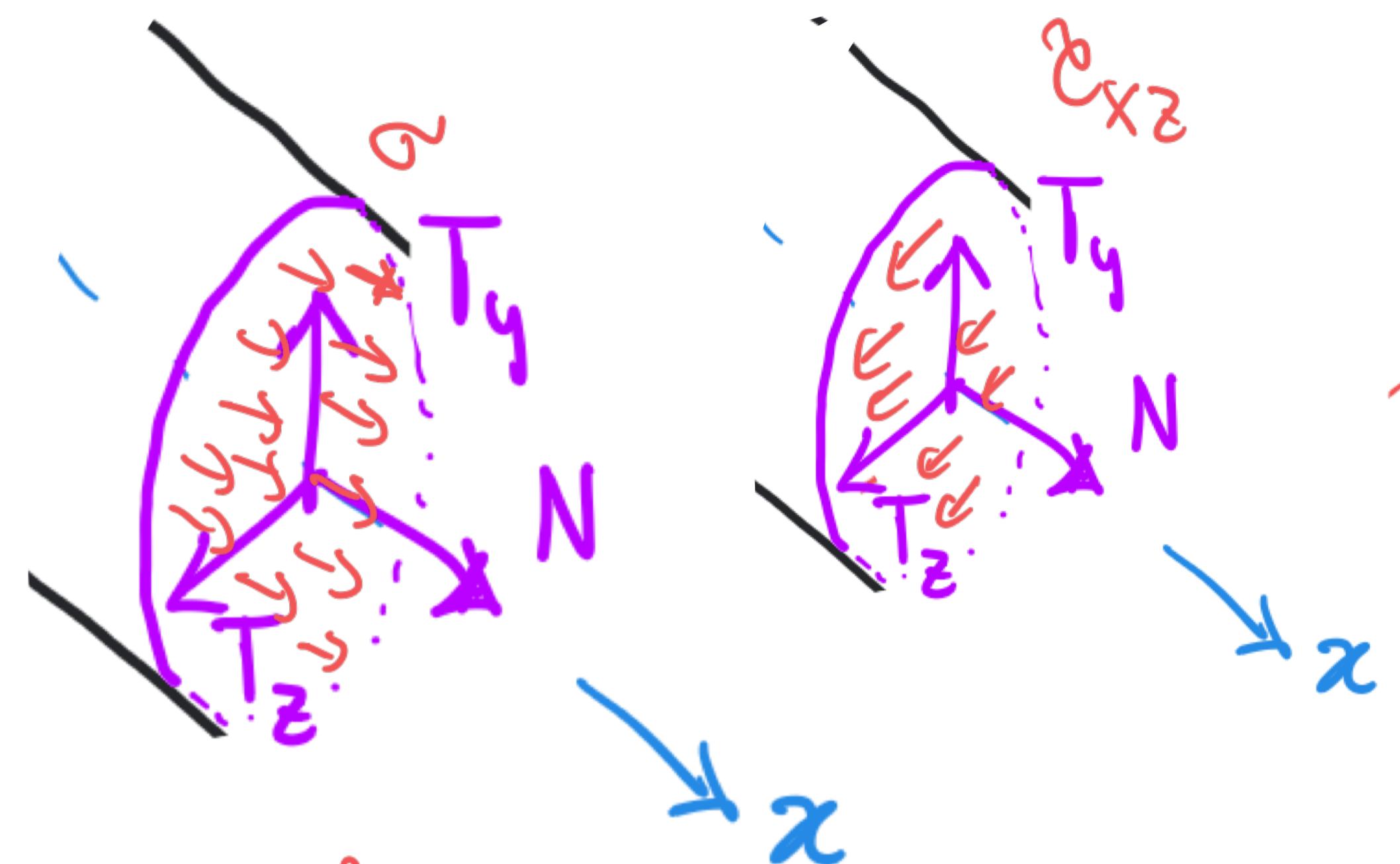
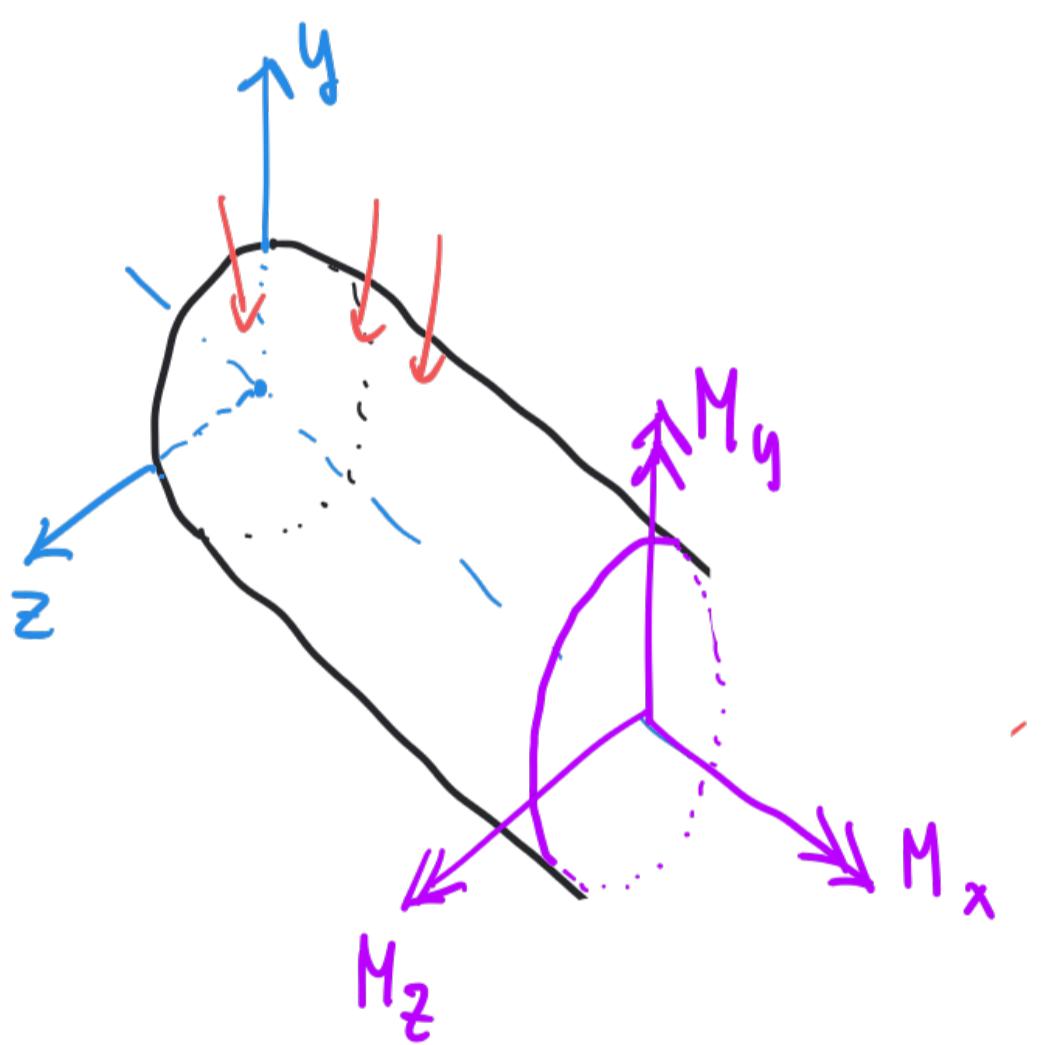
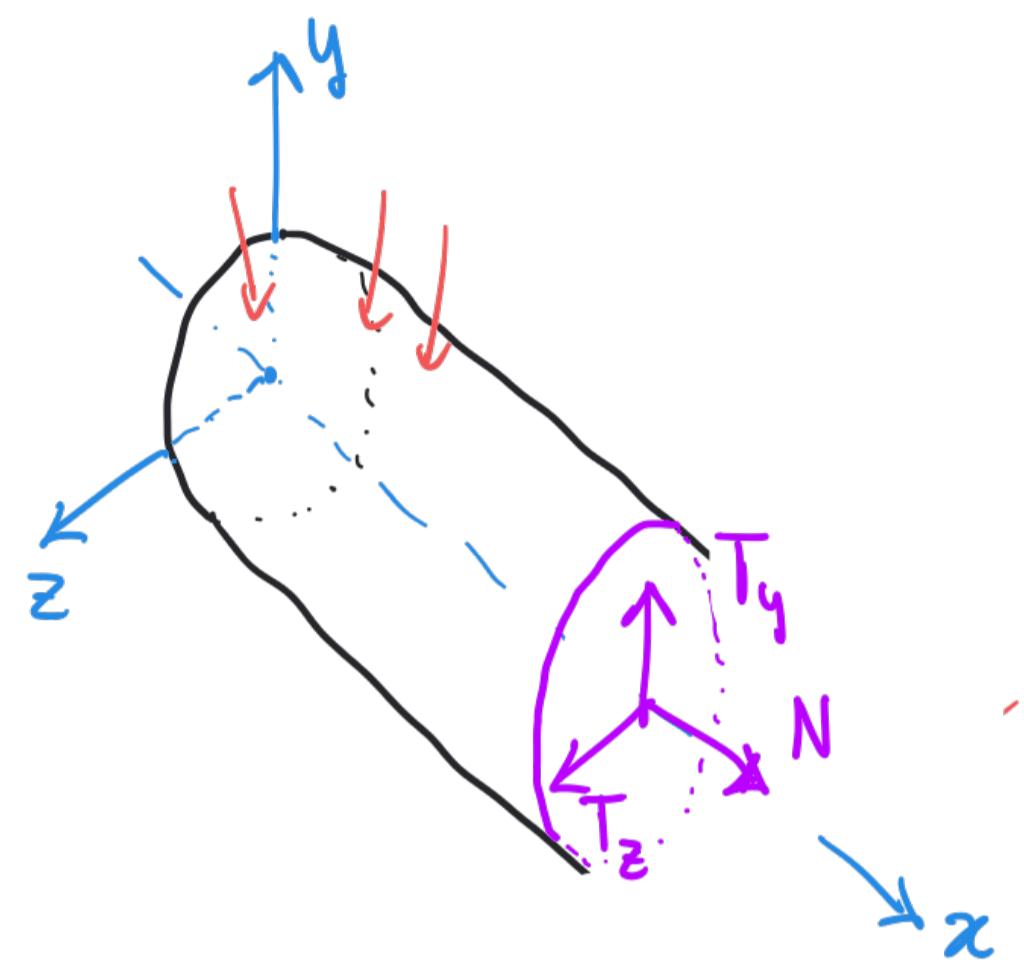


Corpi avendo una dimensione predominante
esibiscono un comportamento "più prevedibile"
a fronte dei fenome





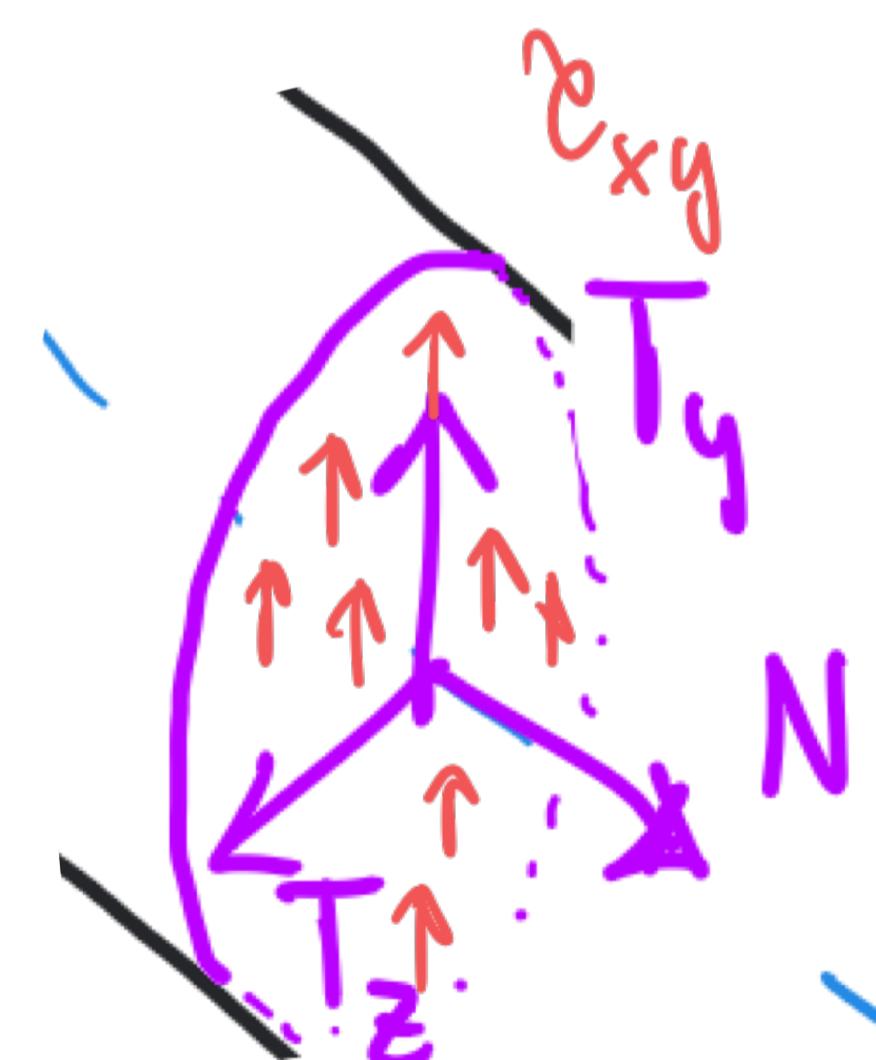
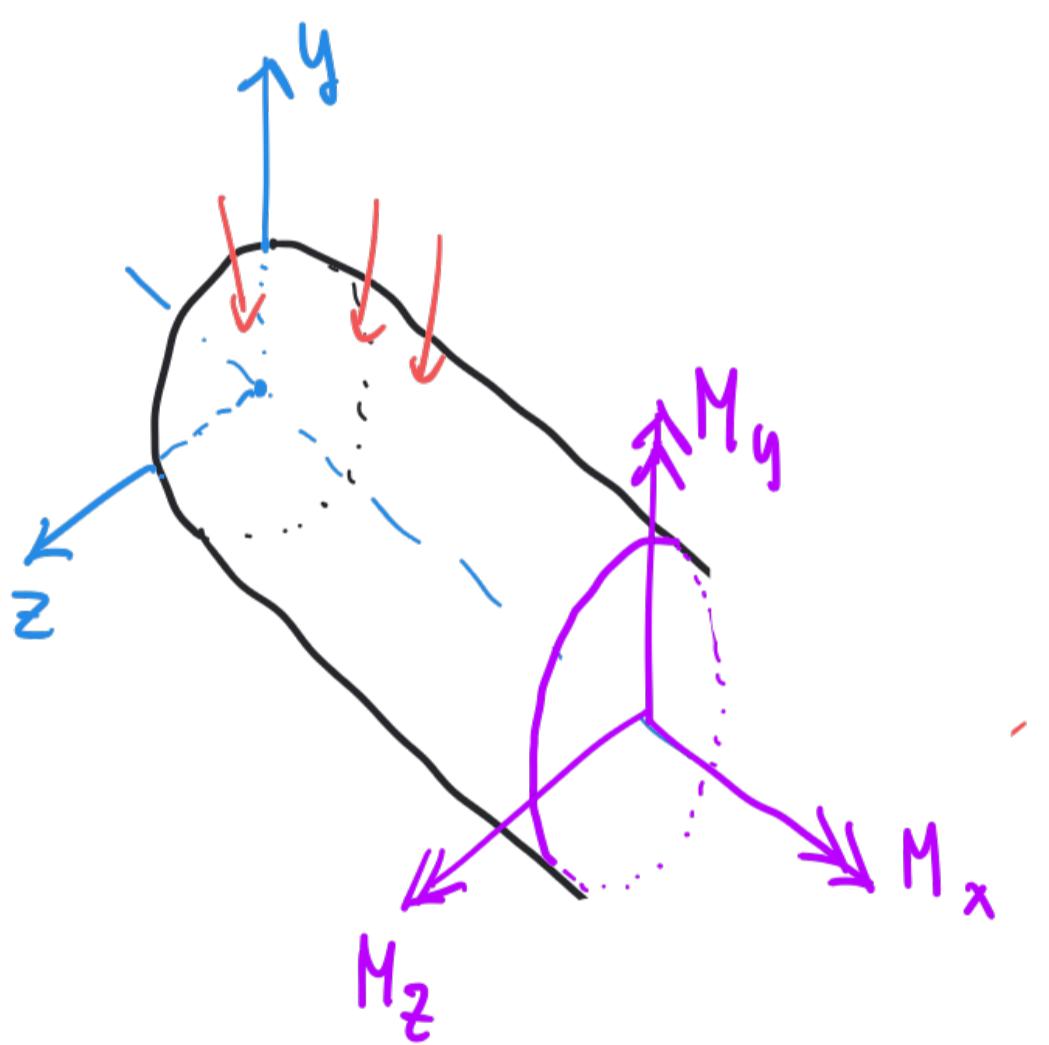
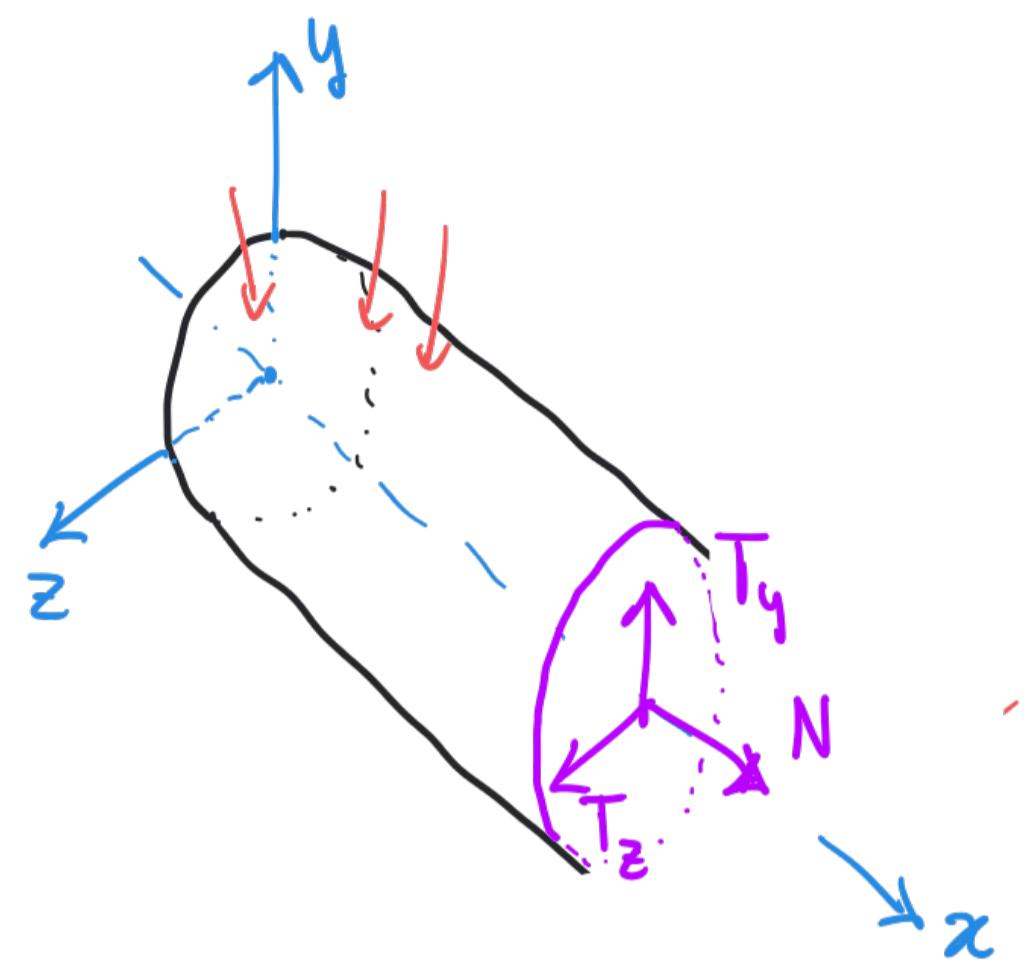




$$N = \int_A \sigma dA$$

$$T_y = \int_A c_{xy} dA$$

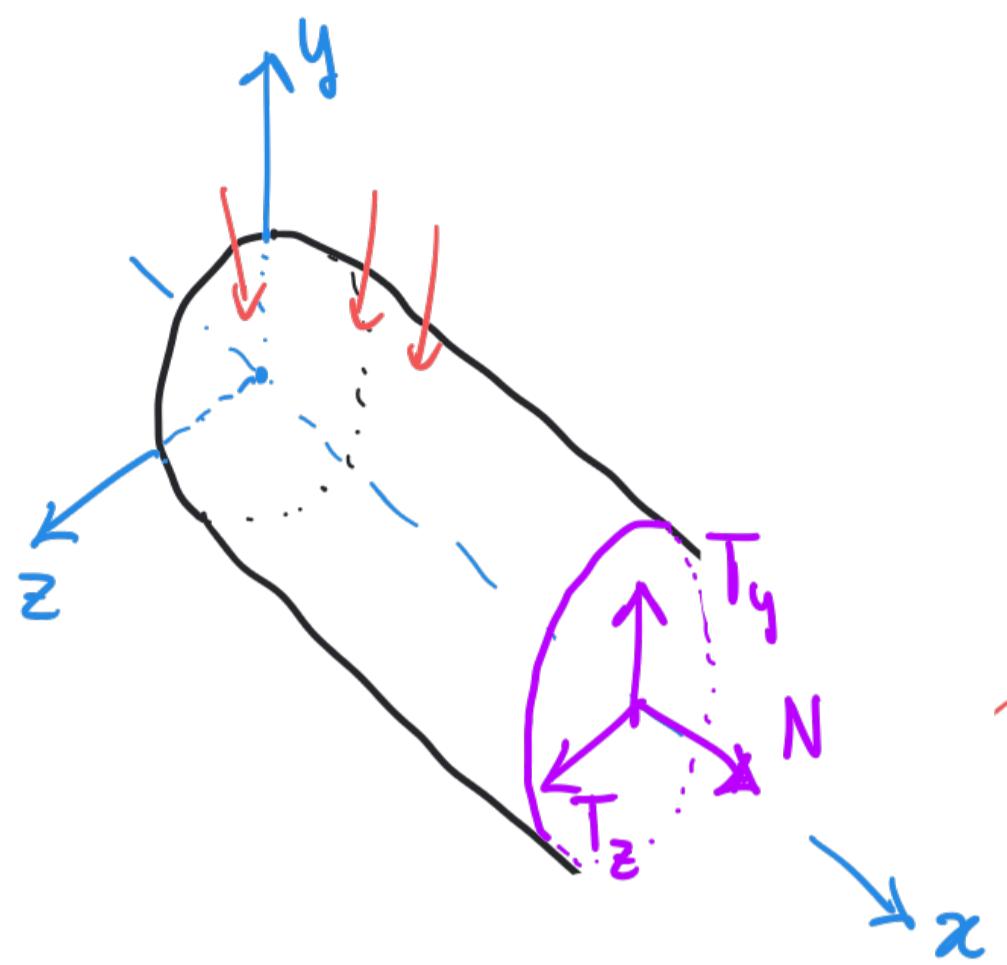
$$T_z = \int_A c_{xz} dA$$



$$N = \int_A \sigma dA$$

$$T_y = \int_A \epsilon_{xy} dA$$

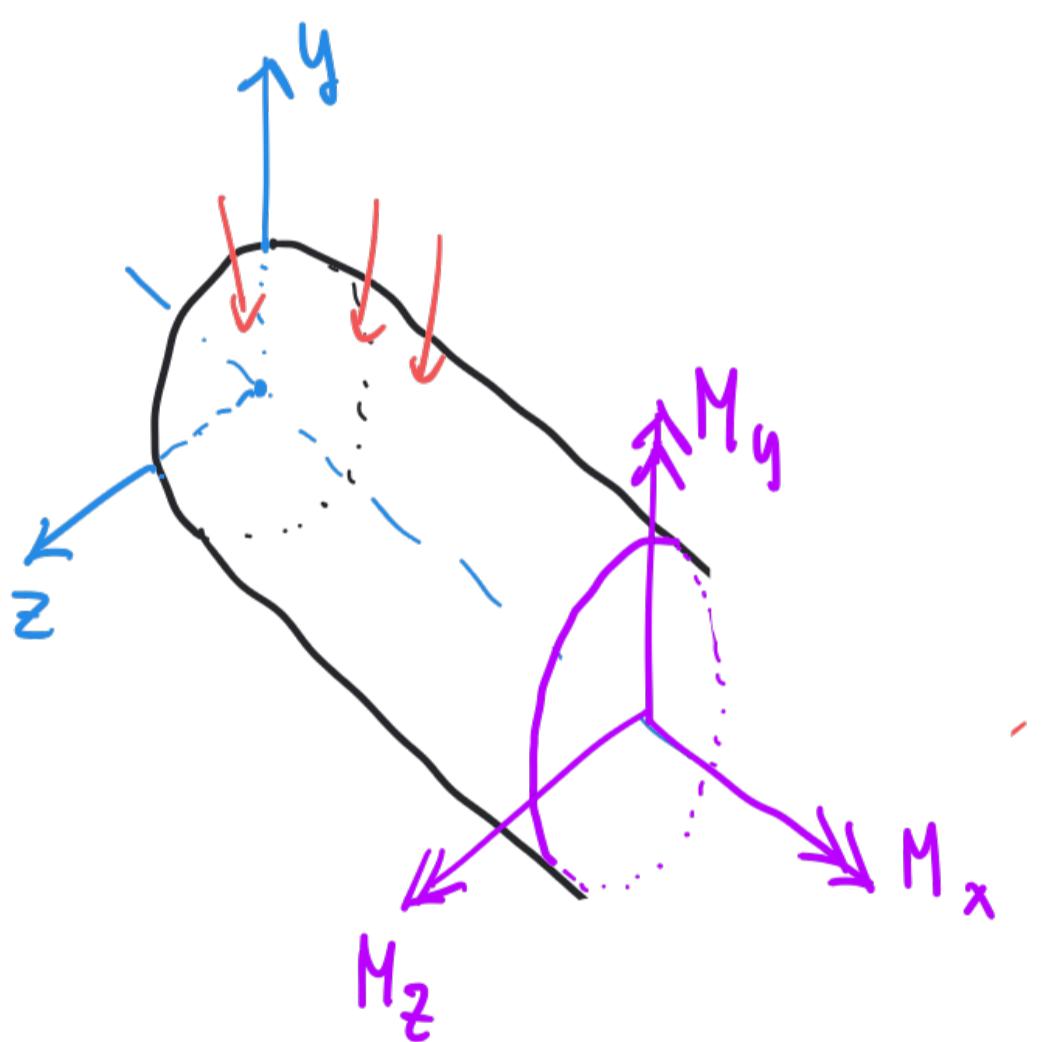
$$T_z = \int_A \epsilon_{xz} dA$$

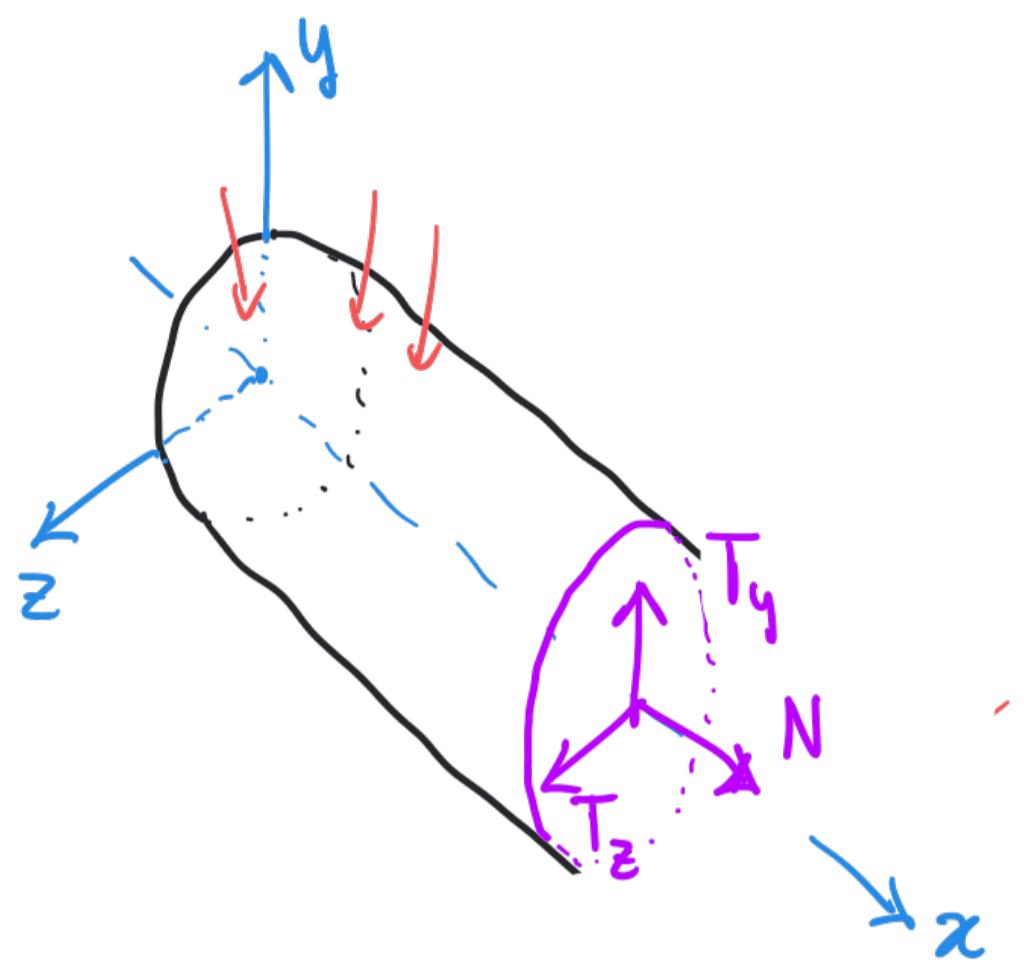


$$M_z = - \int_A \sigma_y dA$$

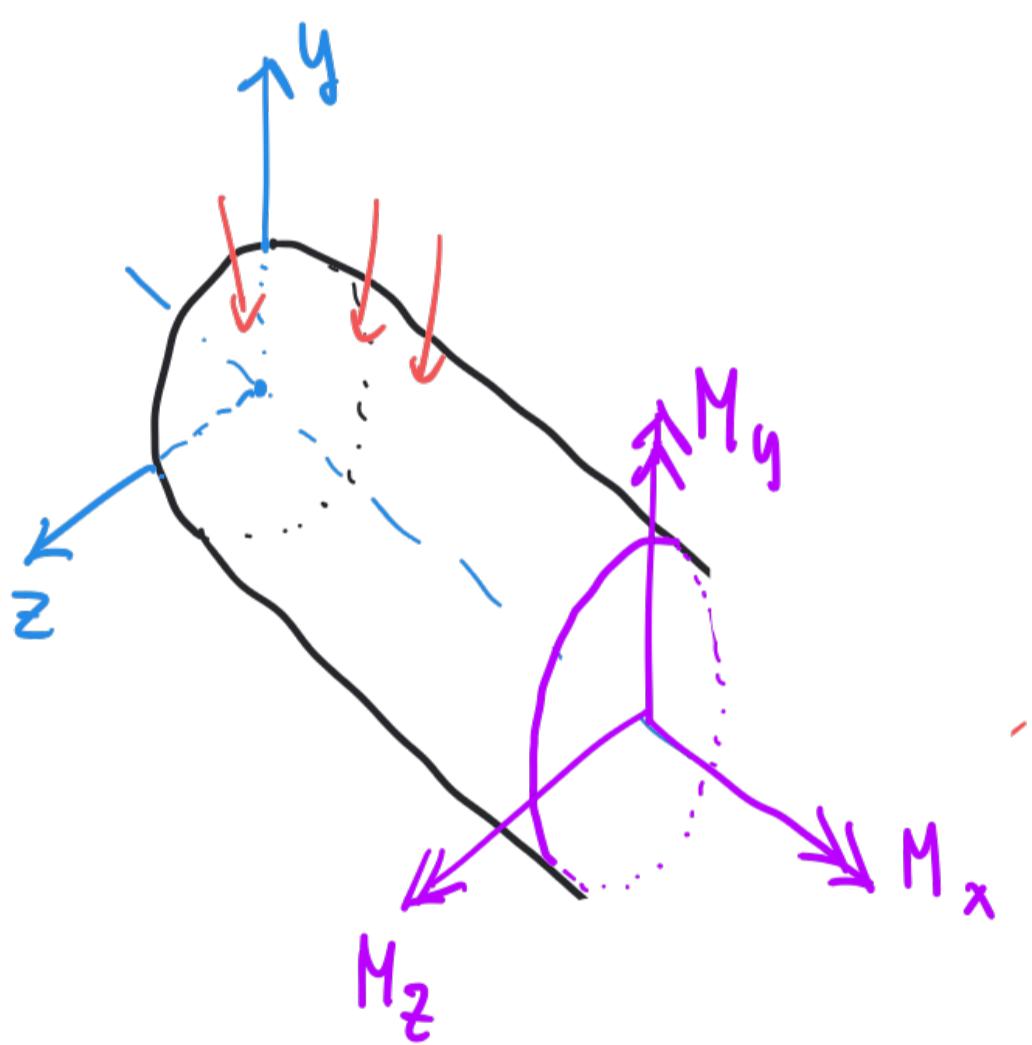
$$M_y = \int_A \sigma_z dA$$

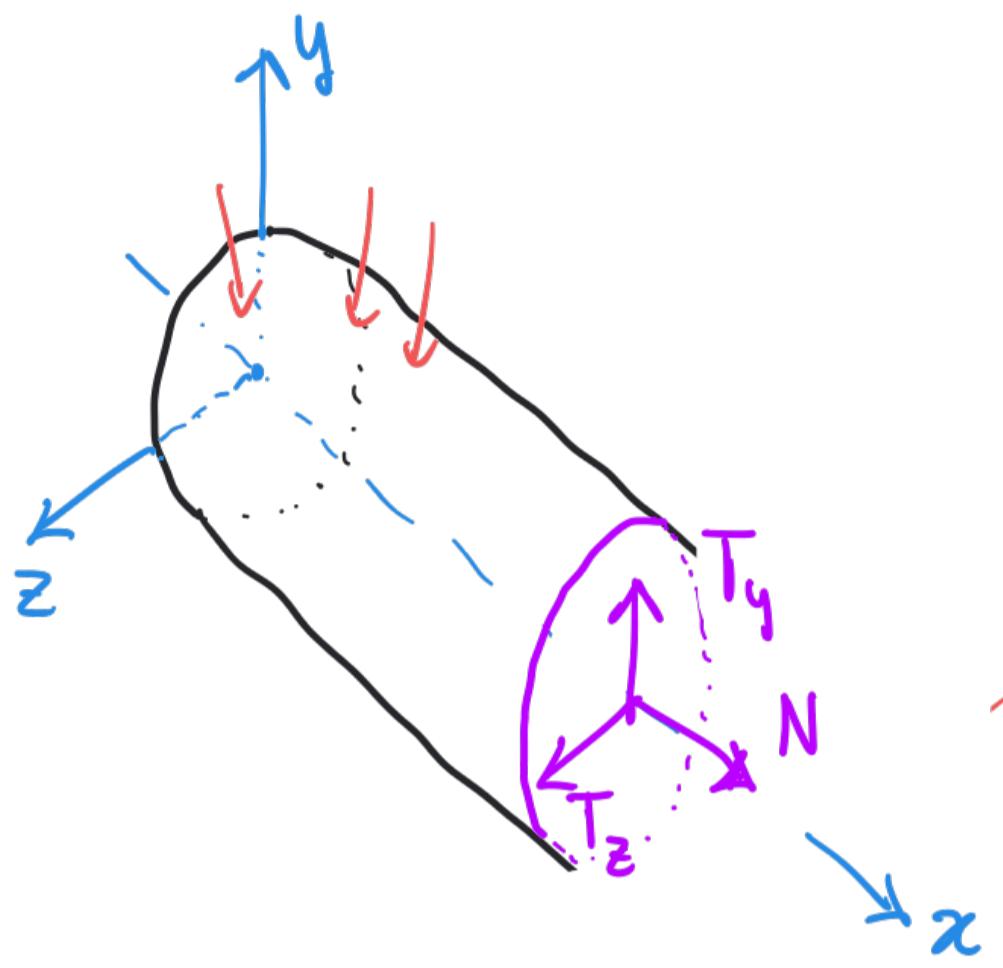
$$M_x = \int_A (\tau_{xy}z - \tau_{xz}y) dA$$





$$M_z = - \int_A \sigma y \, dA$$

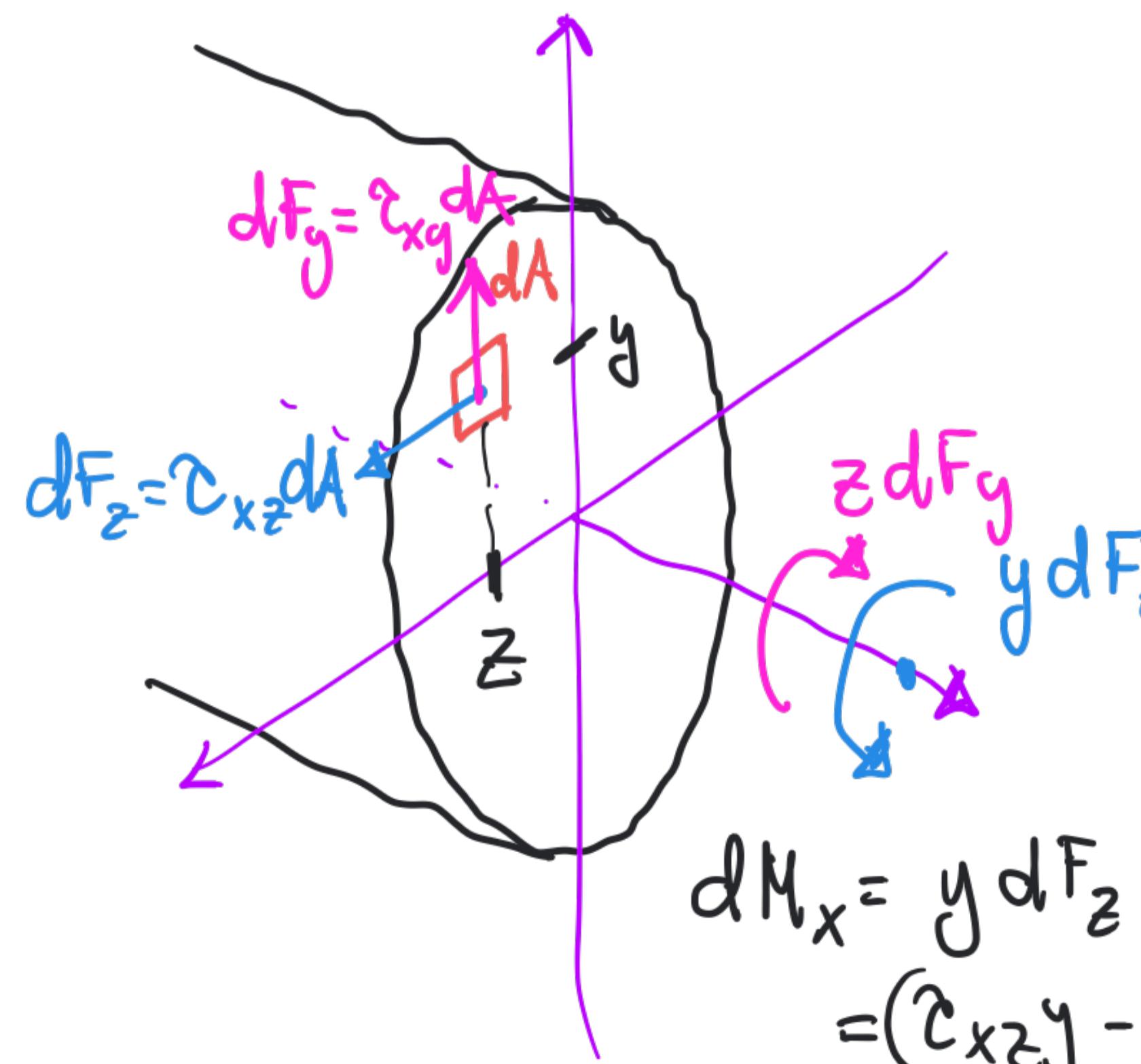
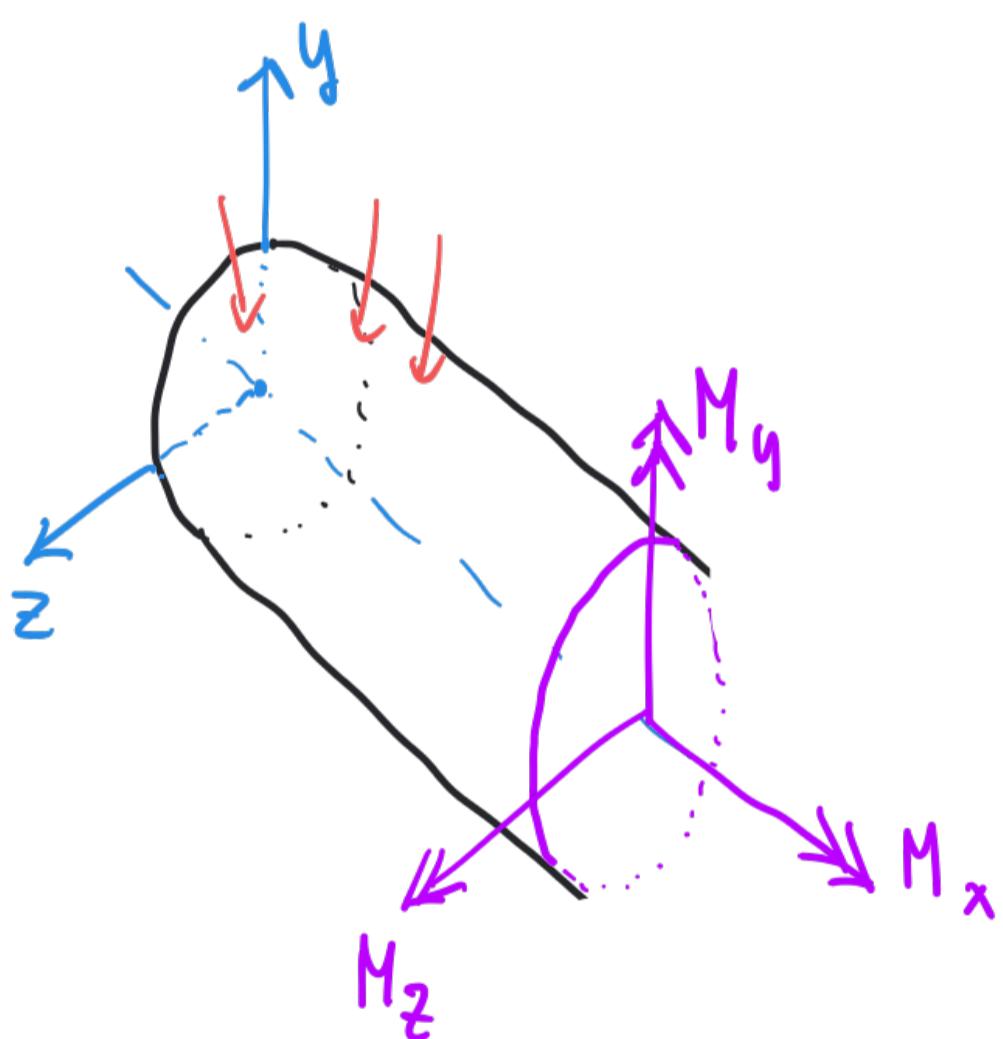




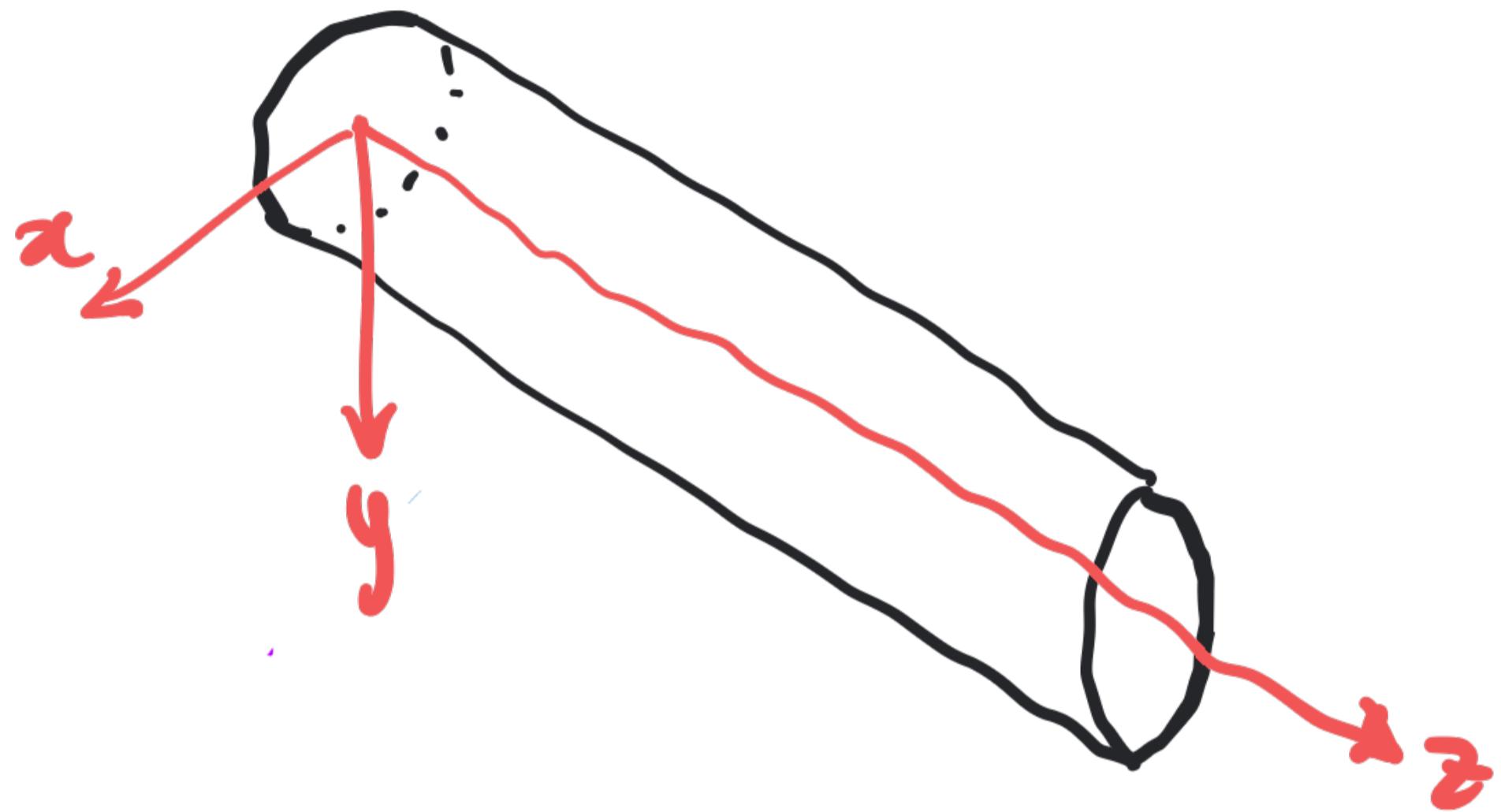
$$M_z = - \int_A \sigma_y dA$$

$$M_y = \int_A \sigma_z dA \quad (\text{esercizio})$$

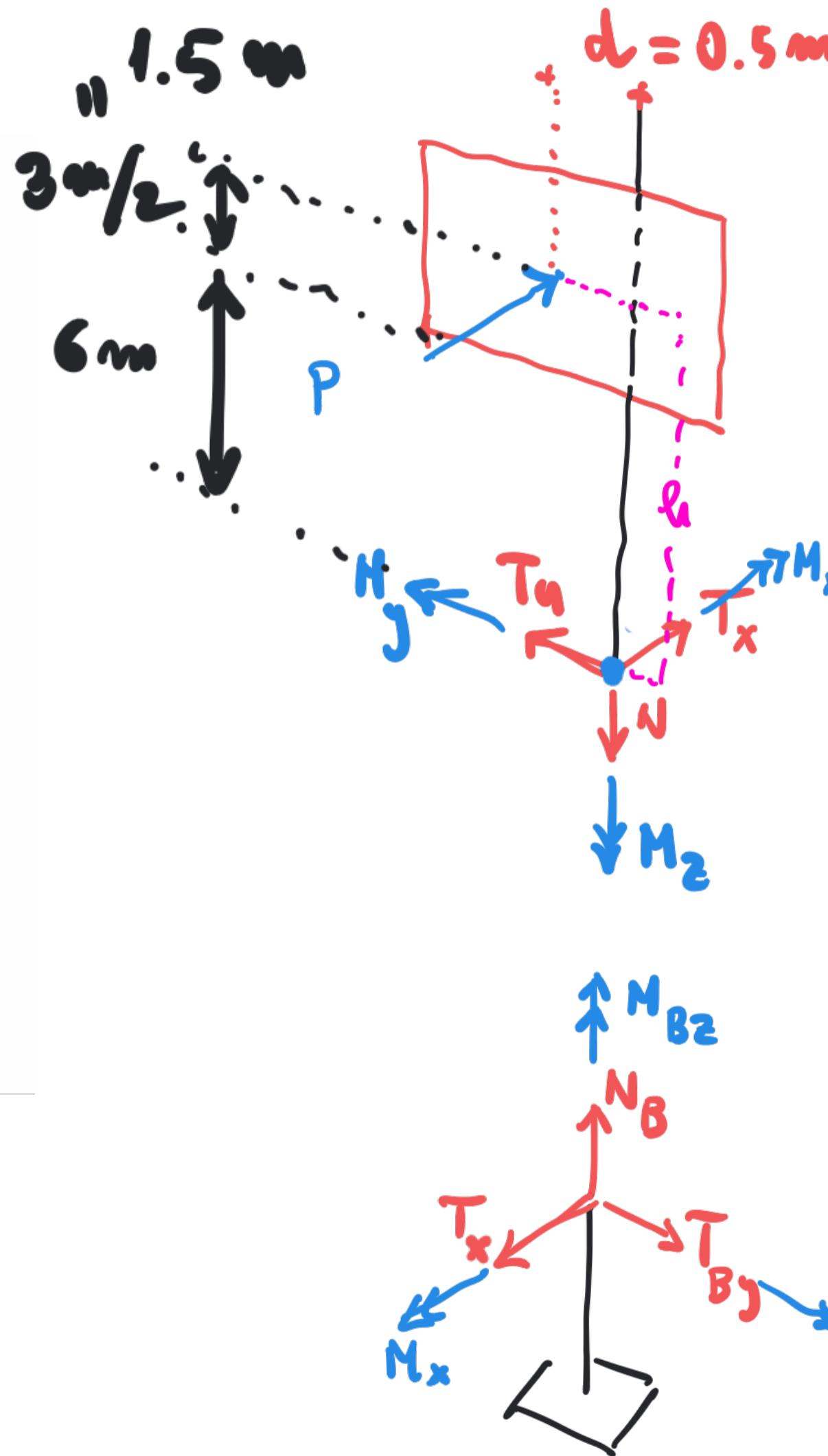
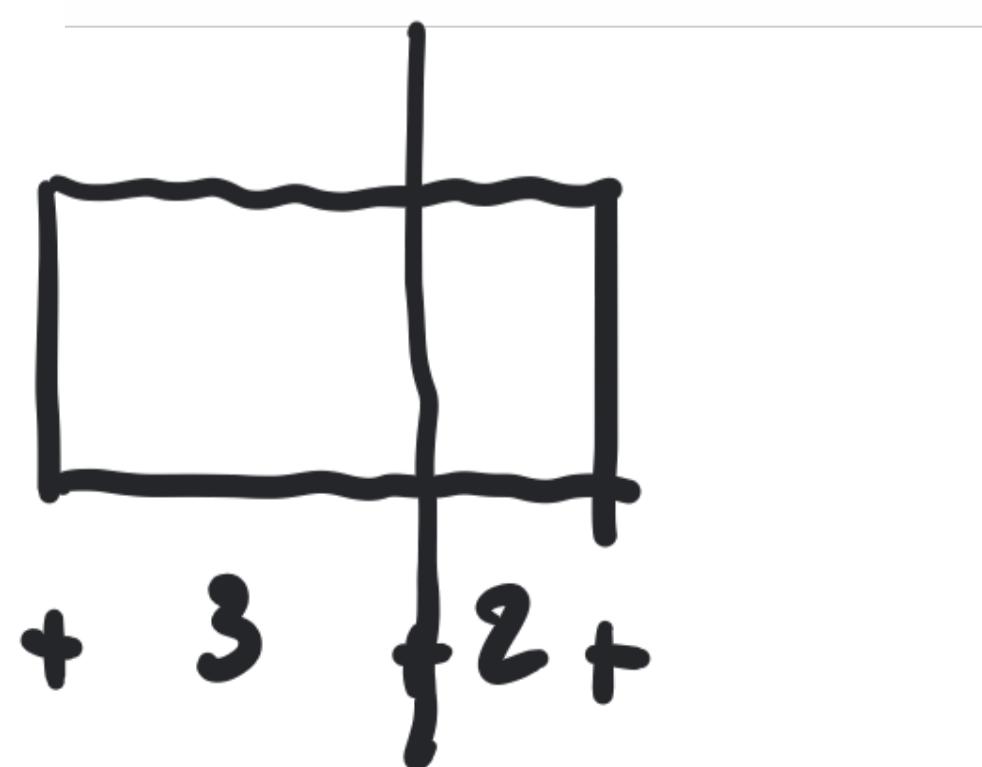
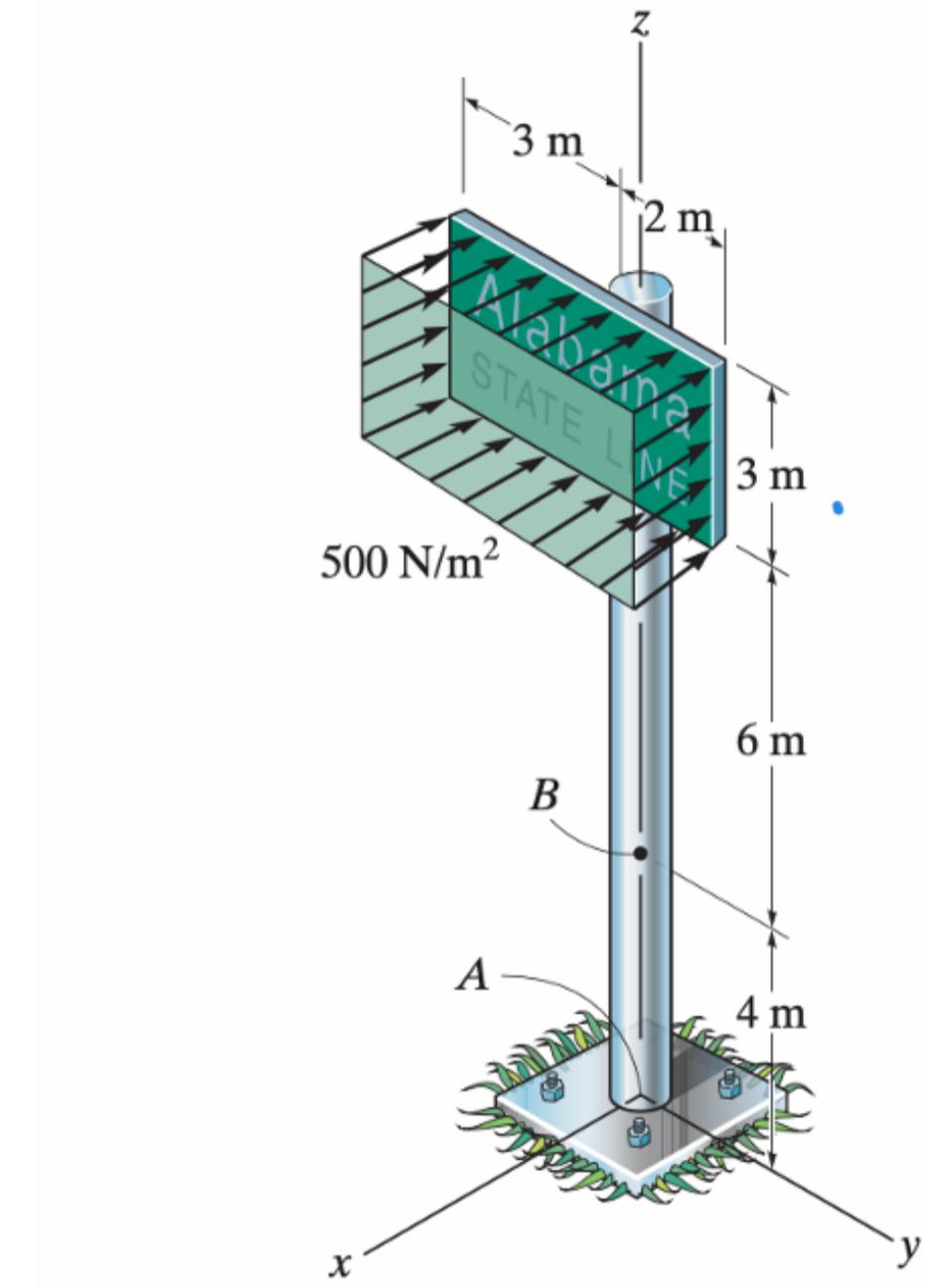
$$M_x = \int_A (c_{xz}y - c_{xy}z) dA$$



CONVENZIONE ITALIANA



AZIONI INTERNE



$$P = 500 \frac{\text{N}}{\text{m}^2} \cdot 15 \text{ m}^2 = 7.5 \text{ kN}$$

$$\sum F_x = 0 \quad -T_{Bx} - P = 0$$

$$T_{Bx} = -7.5 \text{ kN}$$

$$\sum F_y = 0 \quad -T_{By} = 0$$

$$\sum F_z = 0 \quad N_B = 0$$

$$\sum M_x = 0 \quad -M_{Bx} = 0$$

$$\sum M_y = 0 \quad -M_{By} - Ph = 0$$

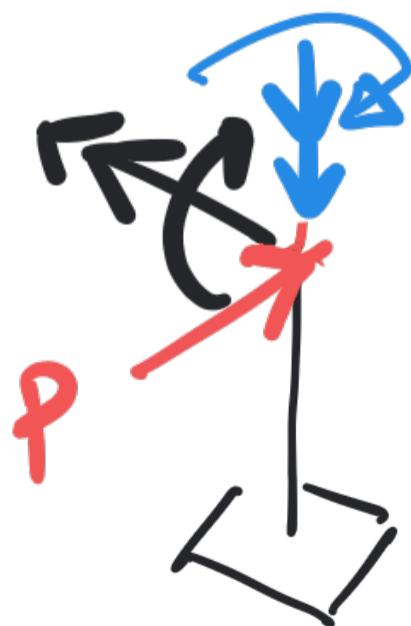
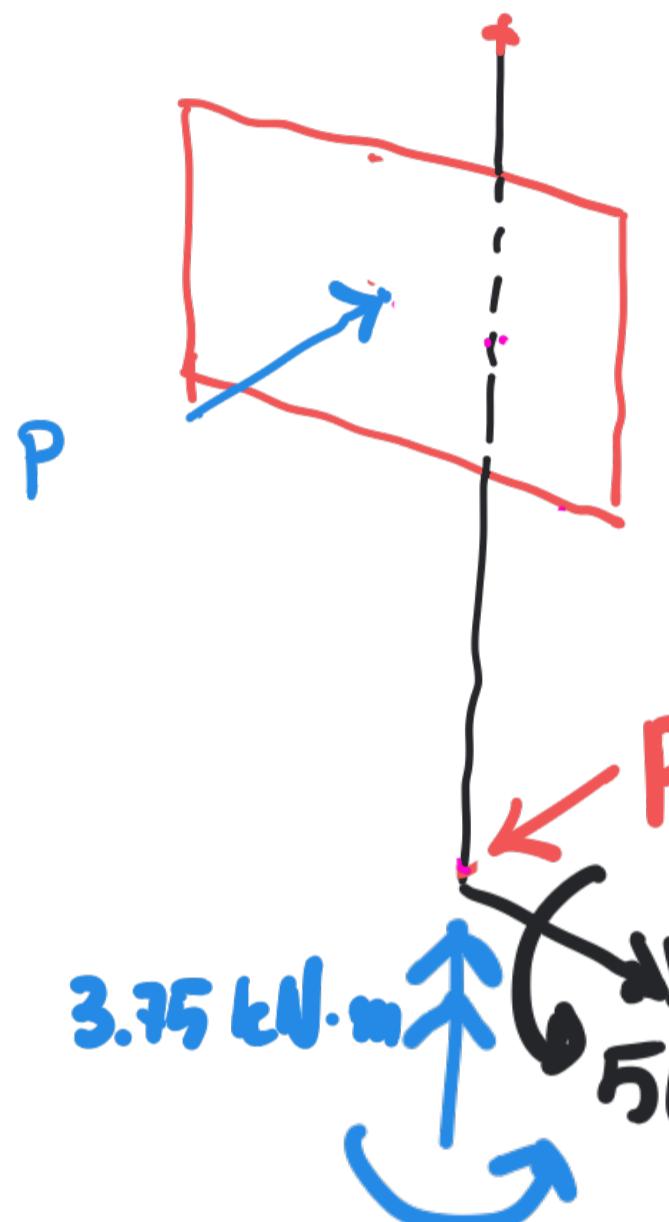
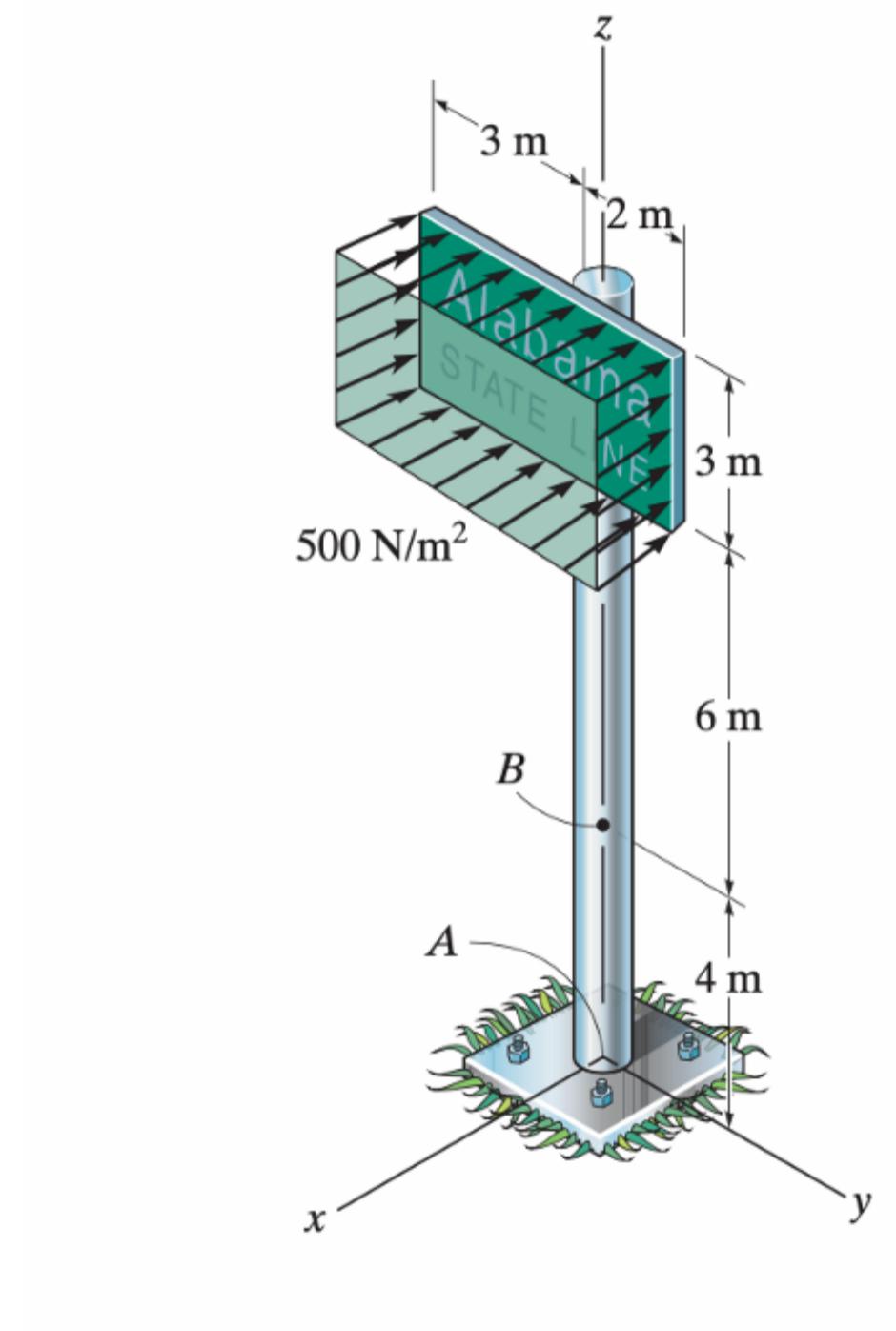
$$M_{By} = -Ph = -7.5 \cdot 7.5 \text{ kN} \cdot \text{m}$$

$$-M_{B2} - Pd = 0$$

$$M_{B2} = -Pd$$

$$= -3.75 \text{ kN} \cdot \text{m}$$

AZIONI INTERNE



$$P = 500 \frac{N}{m^2} \cdot 15 m^2 = 7.5 kN$$

$$\sum F_x = 0 \quad T_{Bx} + P = 0$$

$T_{Bx} = -7.5 kN$

$$\sum F_y = 0 \quad T_{By} = 0$$

$$\sum F_z = 0 \quad N_B = 0$$

$$\sum M_x = 0 \quad M_{Bx} = 0$$

$$3.75 \text{ kN} \cdot \text{m} \quad 56.25 \quad \sum M_y = 0 \quad -M_{Bj} - Ph = 0$$

$M_{By} = -Ph = -56.25 \text{ kN} \cdot \text{m}$

$$\sum M_z = 0 \quad -M_{Bz} - Pd = 0$$

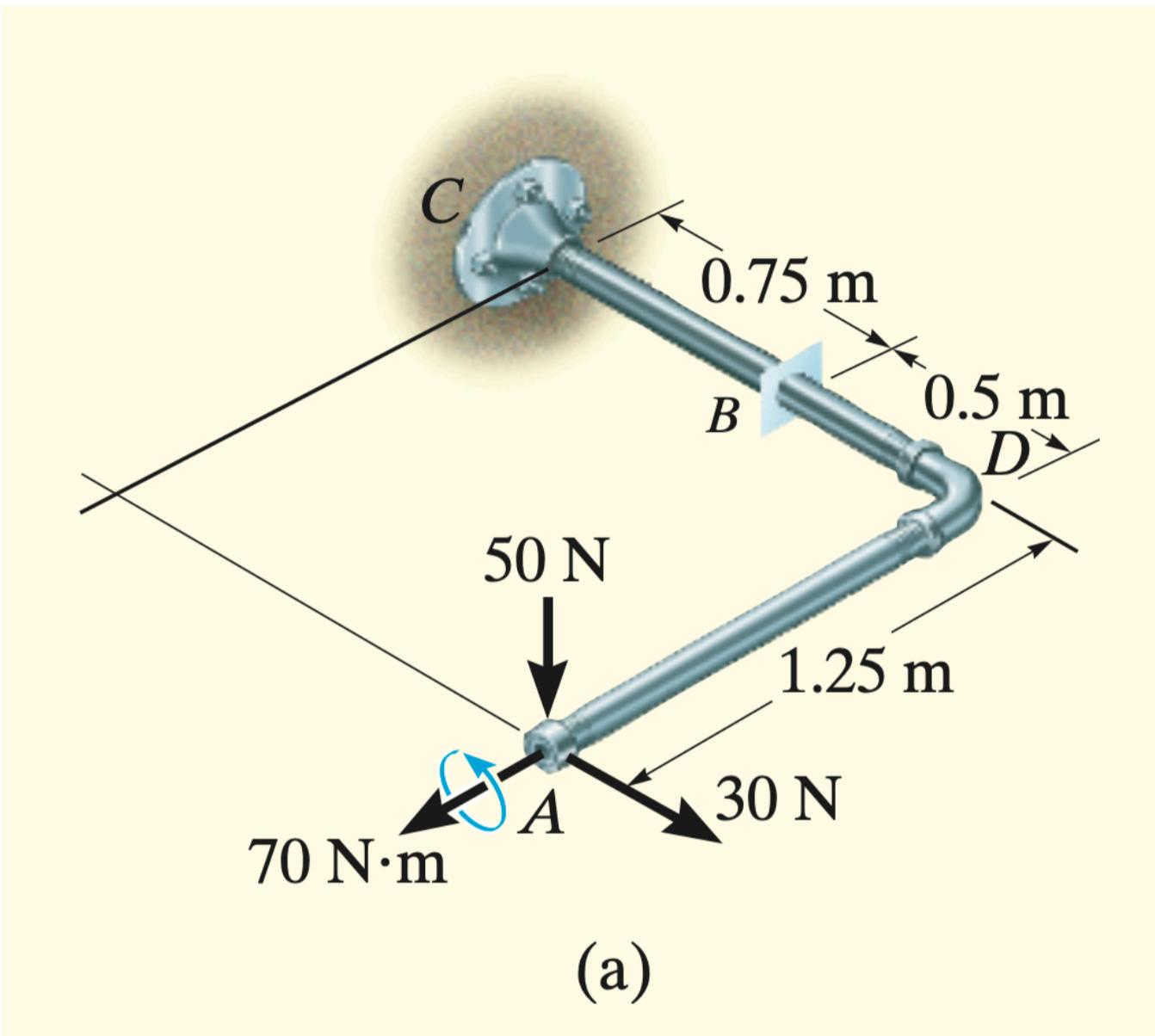
B_y

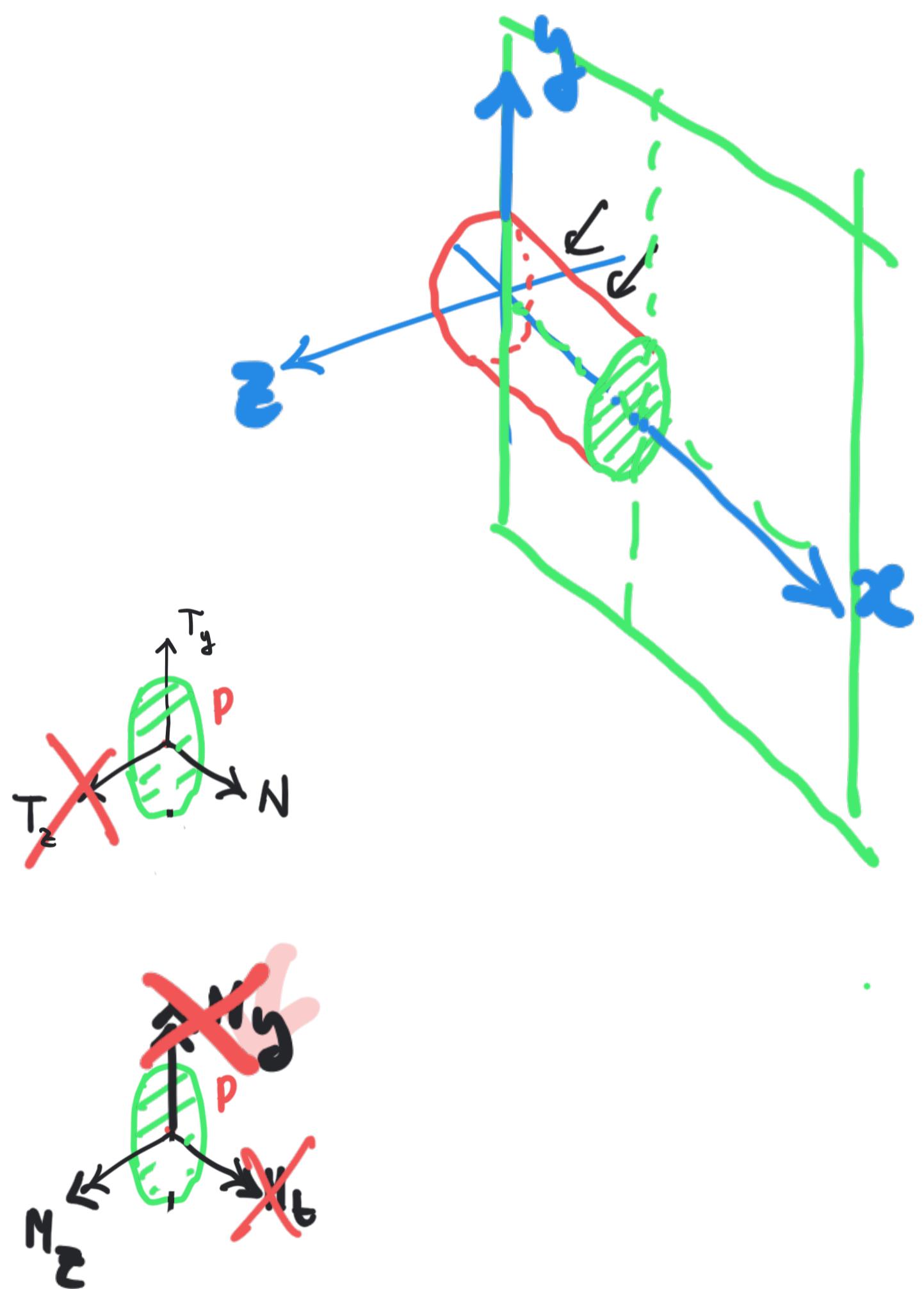
$$M_{Bz} = -Pd$$

$$= -3.75 \text{ kN} \cdot \text{m}$$

ESEMPIO

CALCOLARE LE
CARATTERISTICHE
DELLA SOLLECITAZIONE
NELLA SEZIONE B

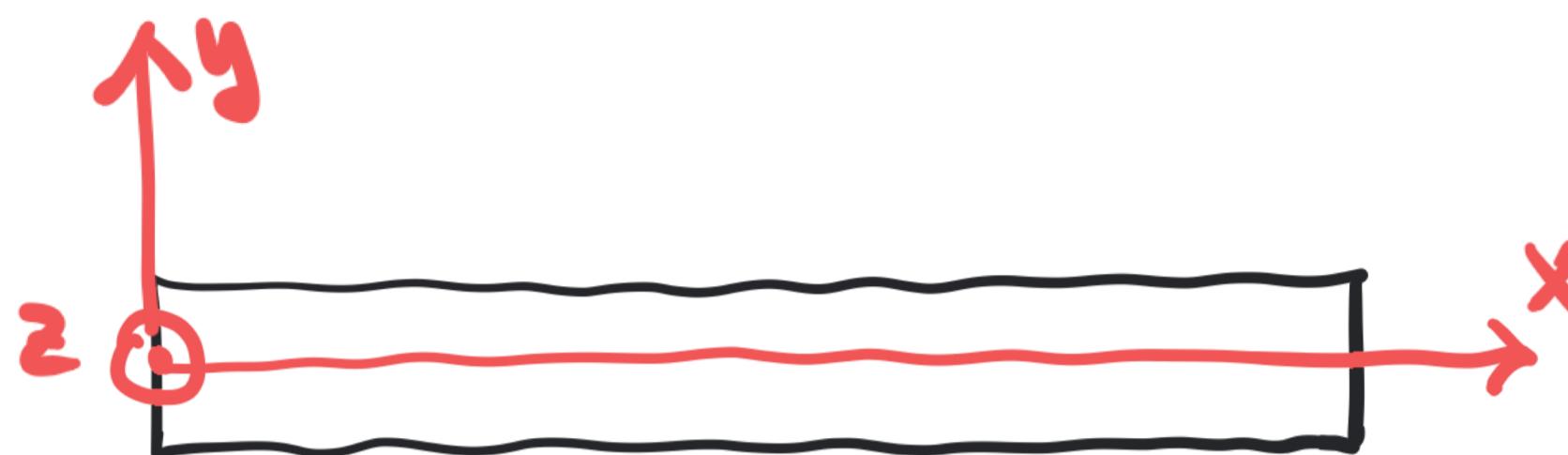




TRAVE PIANA:

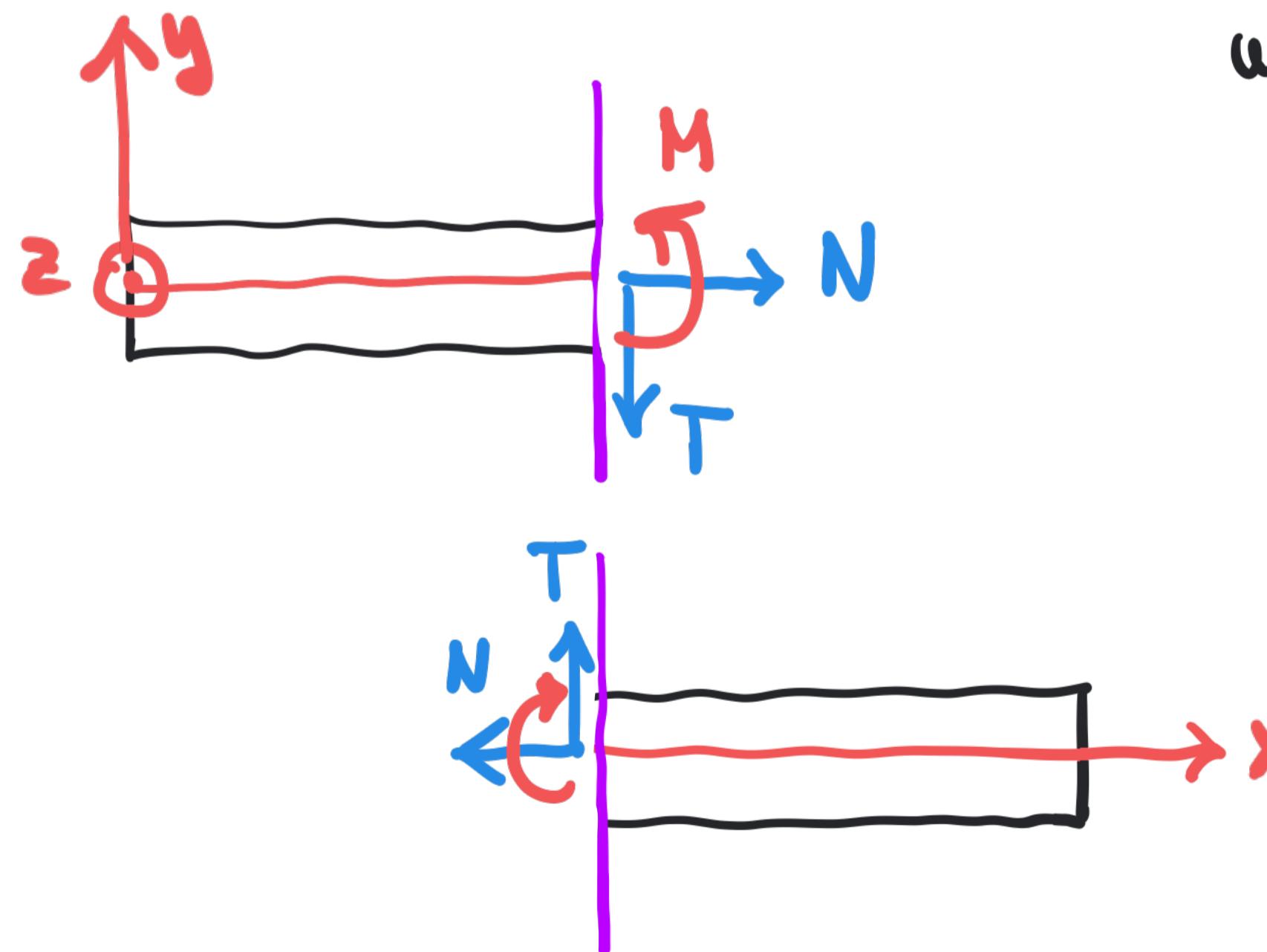
- Simmetrica rispetto al piano x-y
- Forze: appena sul piano x-y
- **Momenti: paralleli a z**

CONVENZIONE DEI SEGNI



Convenzione per i segni delle CdS
per travi piane:

$N > 0$ trazione



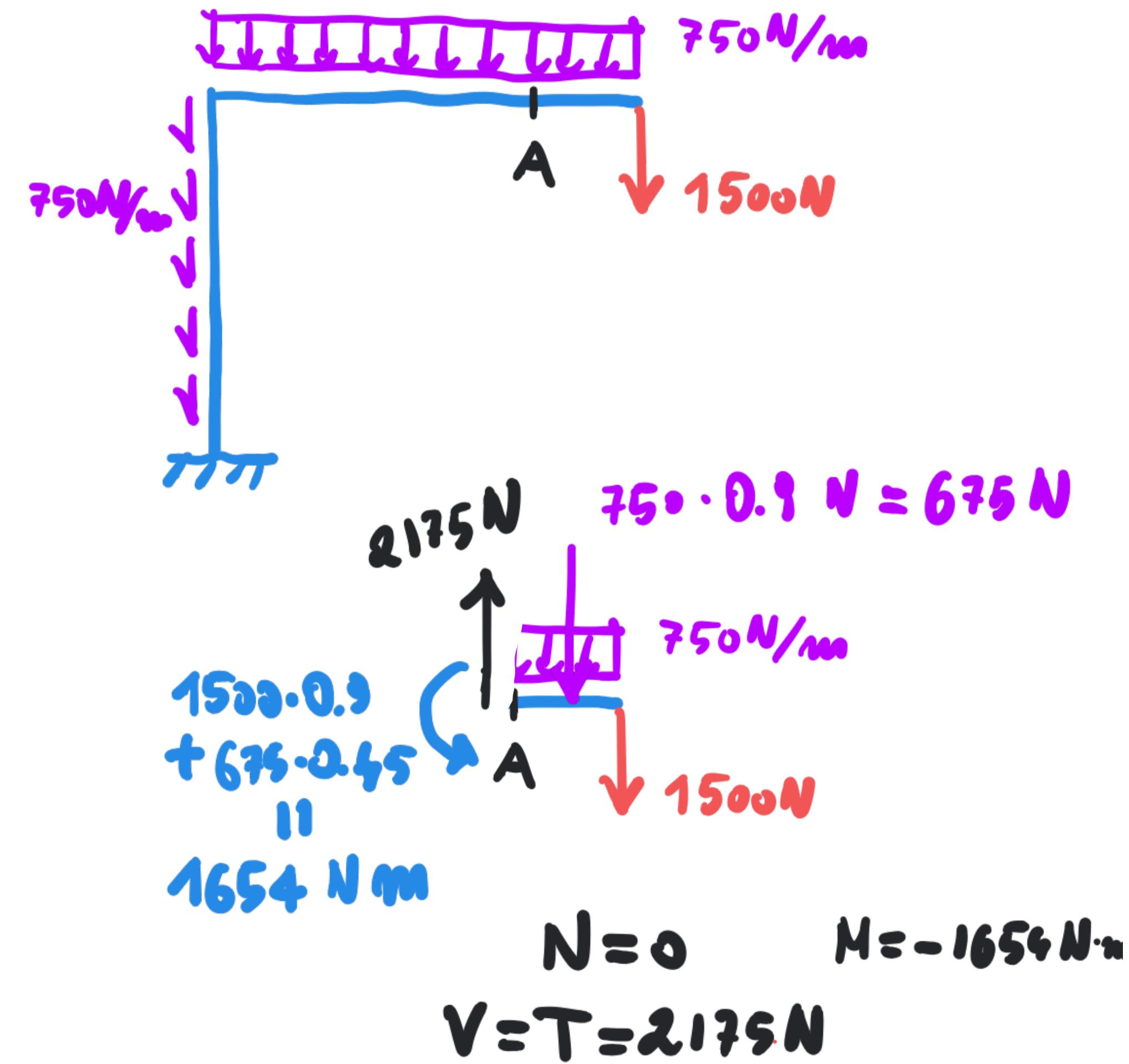
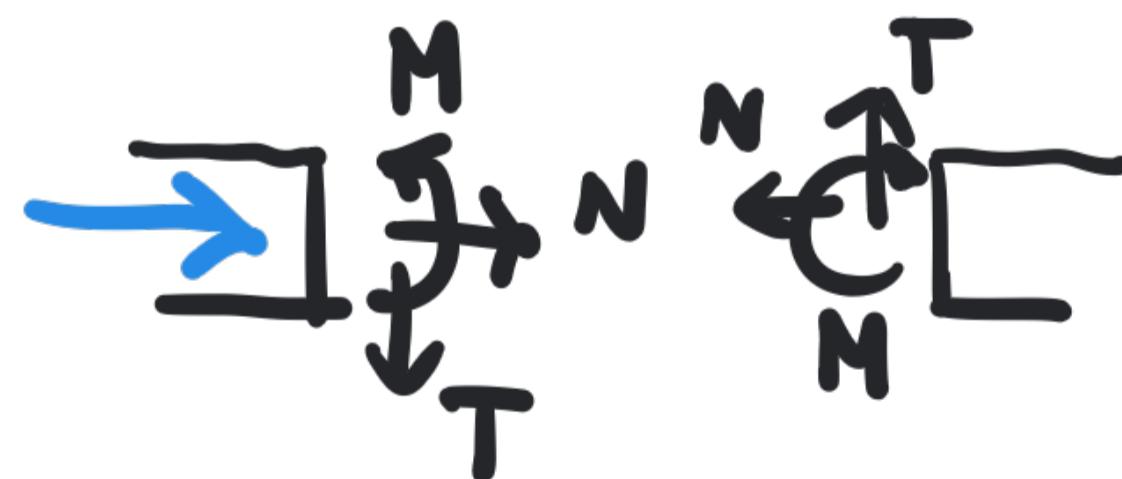
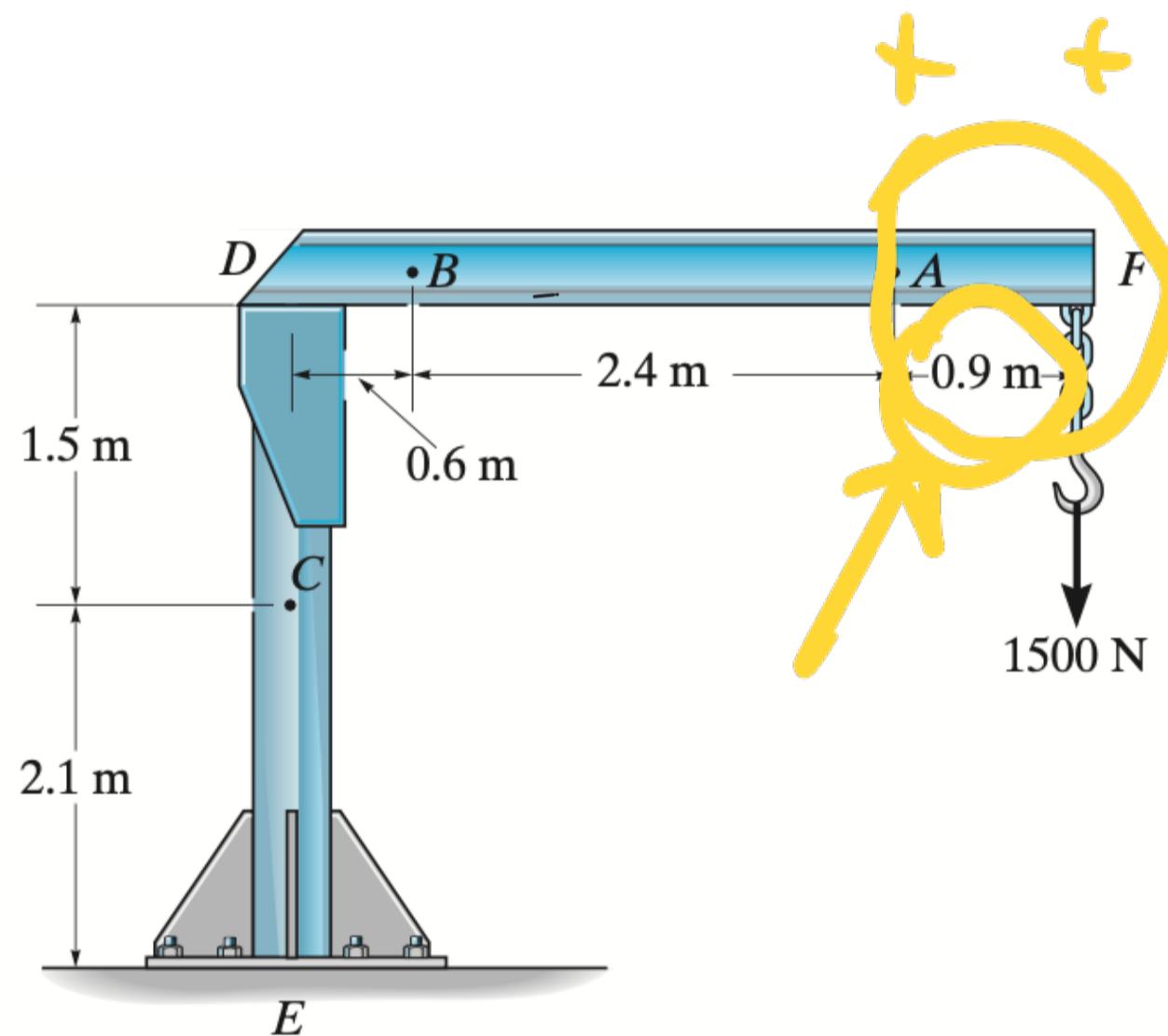
$T > 0$ se il taglio induce una rotazione in verso **ORARIO** del tratto che **PRECEDA**

$M > 0$ se il momento induce una rotazione **ANTI ORARIO** del tratto che **PRECEDA** la sezione

Esempio

La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m . Il carico pesa 1500 N .

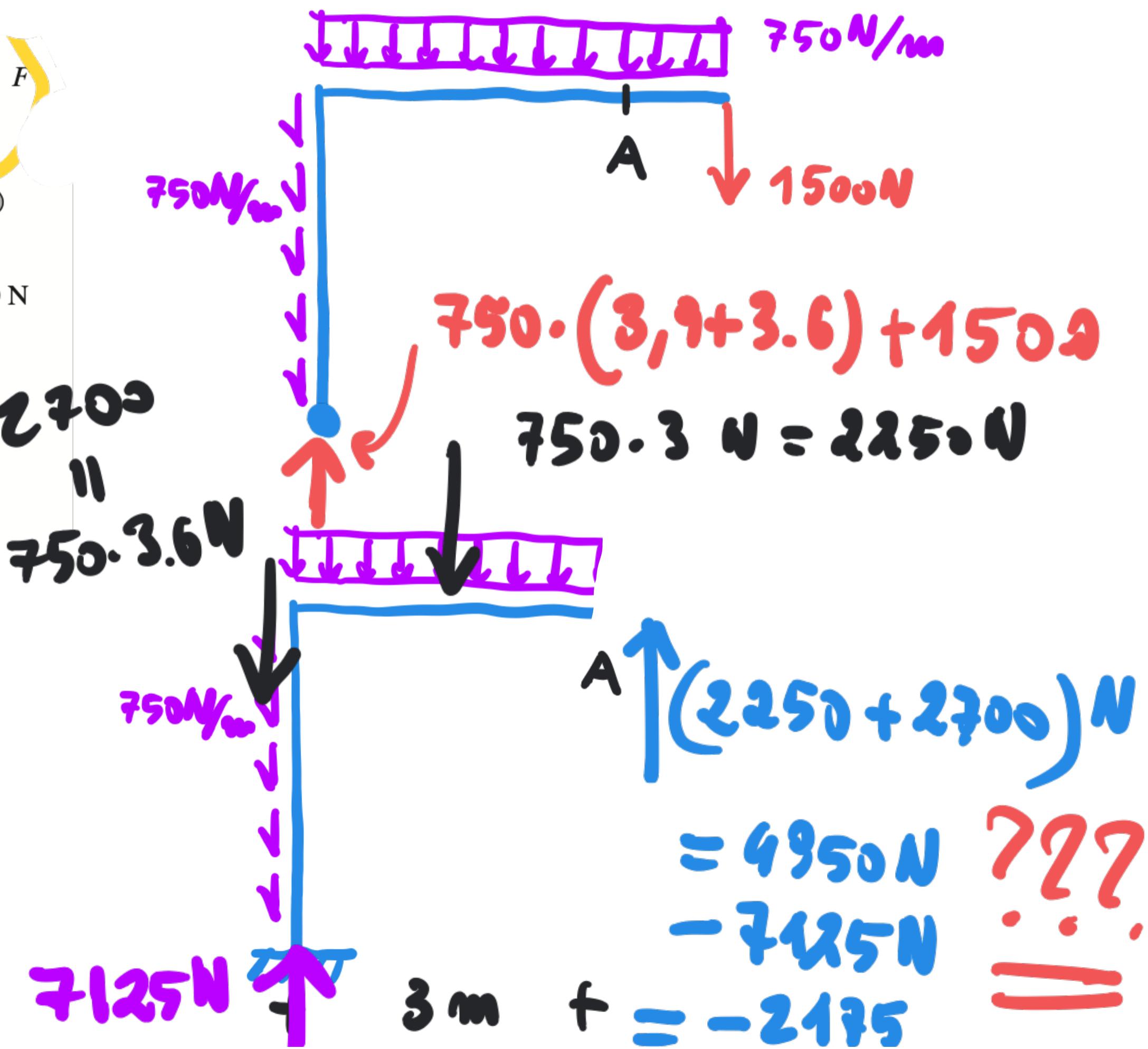
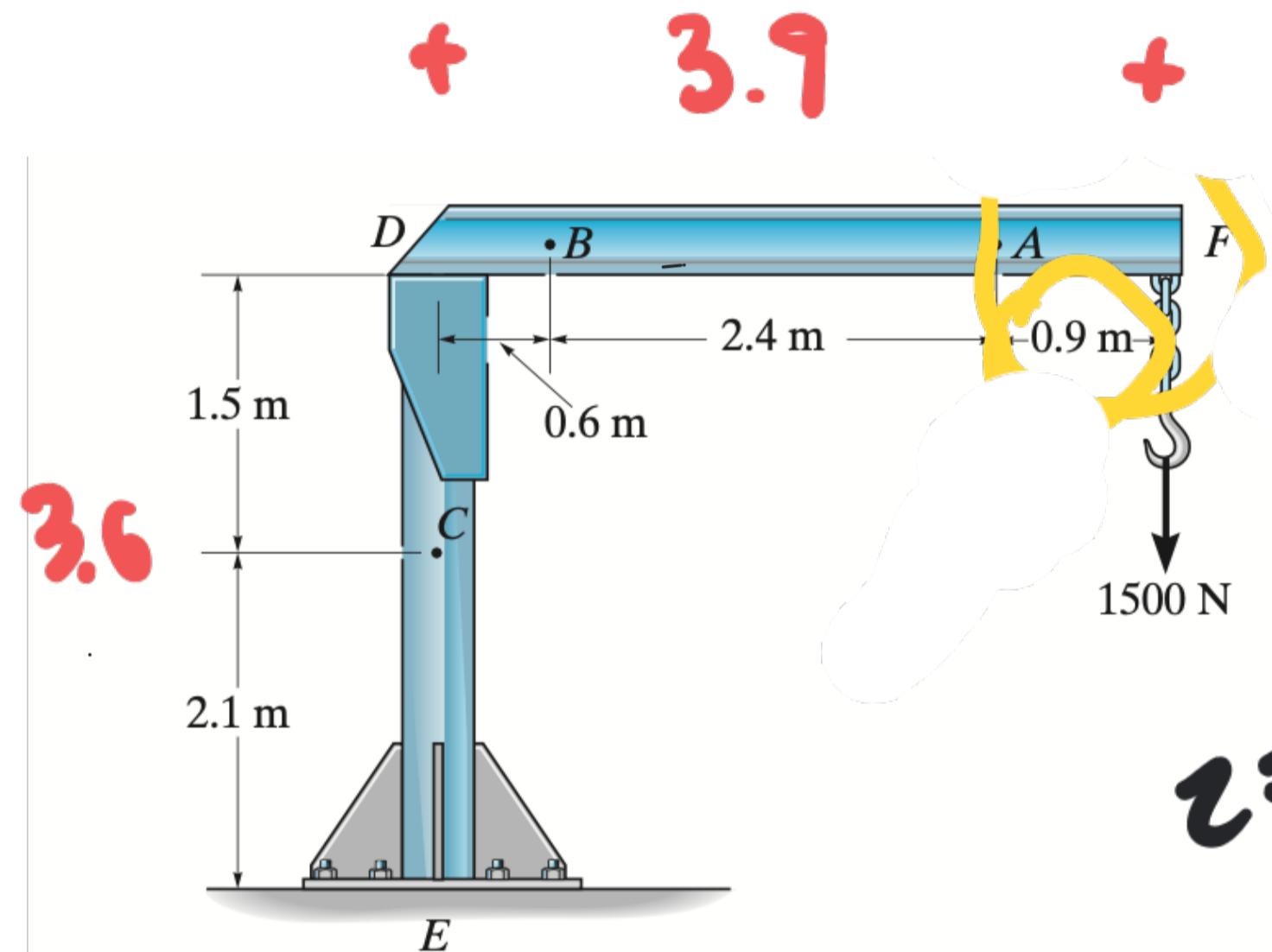
Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .



Esempio

La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m . Il carico pesa 1500 N .

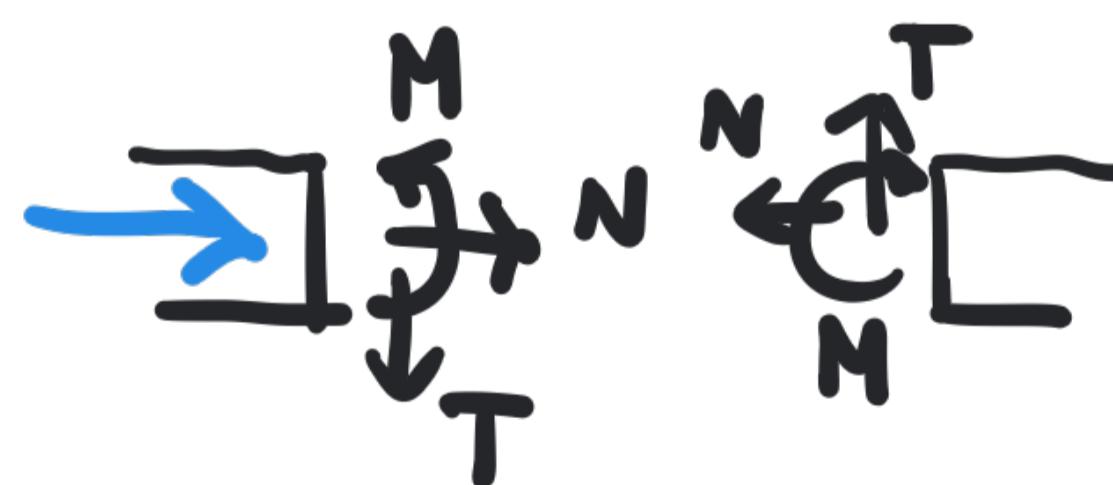
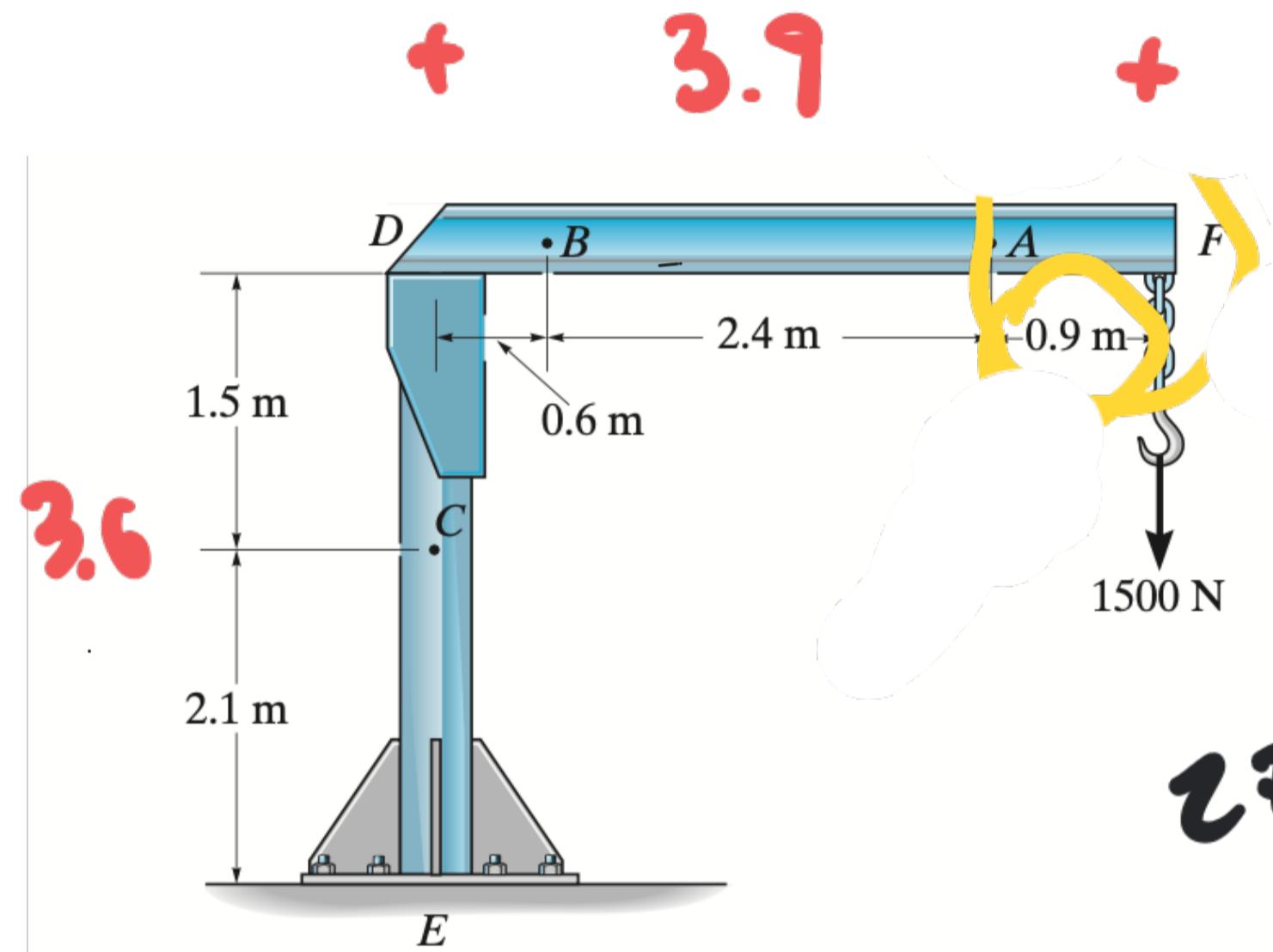
Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .



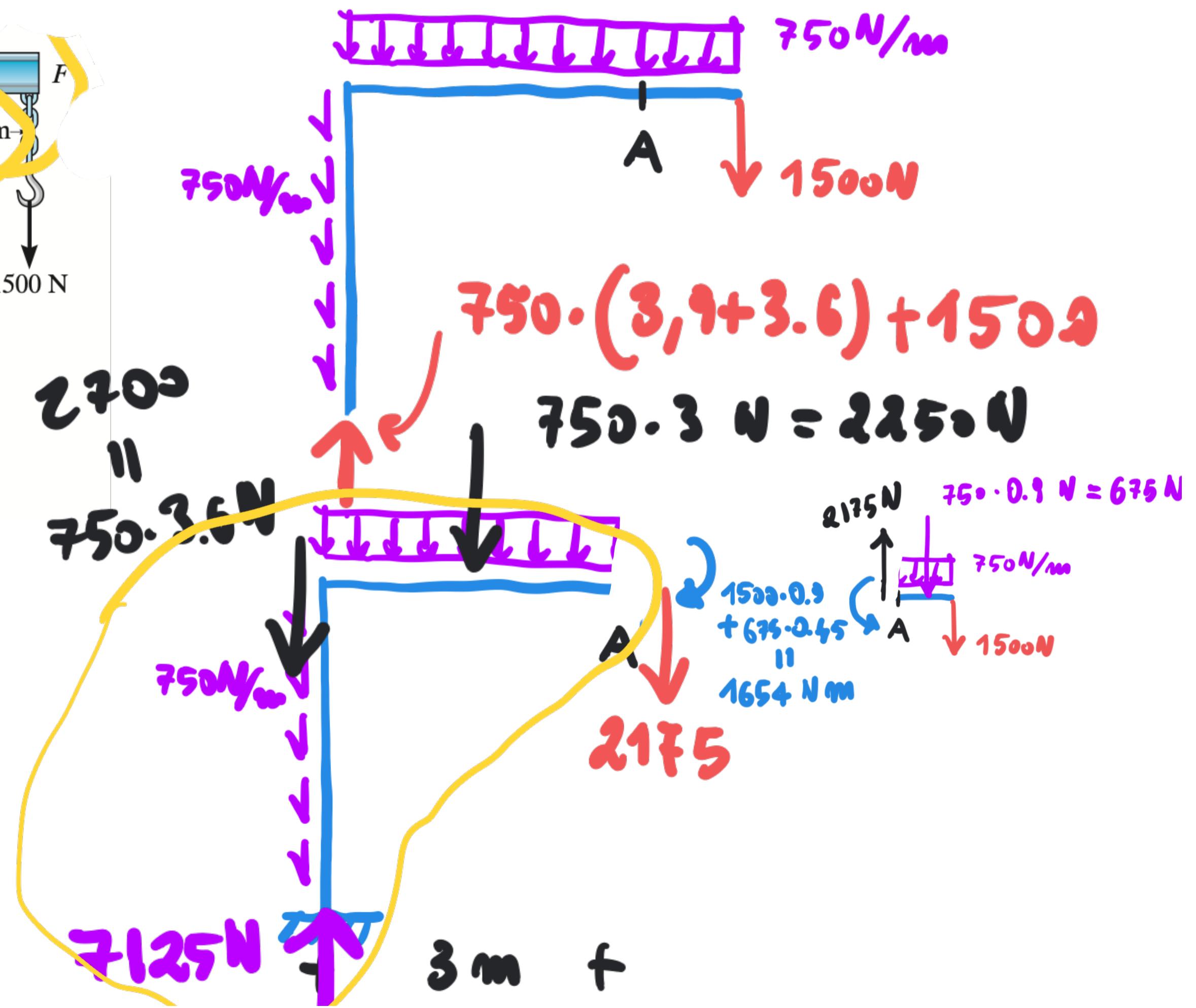
Esempio

La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m . Il carico pesa 1500 N .

Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .



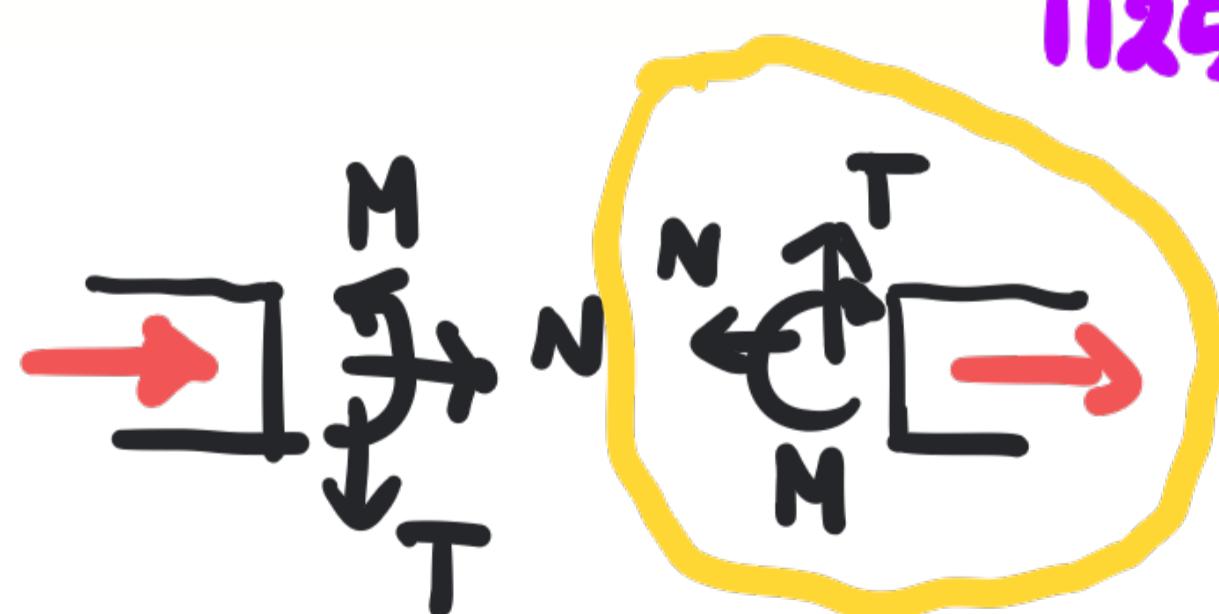
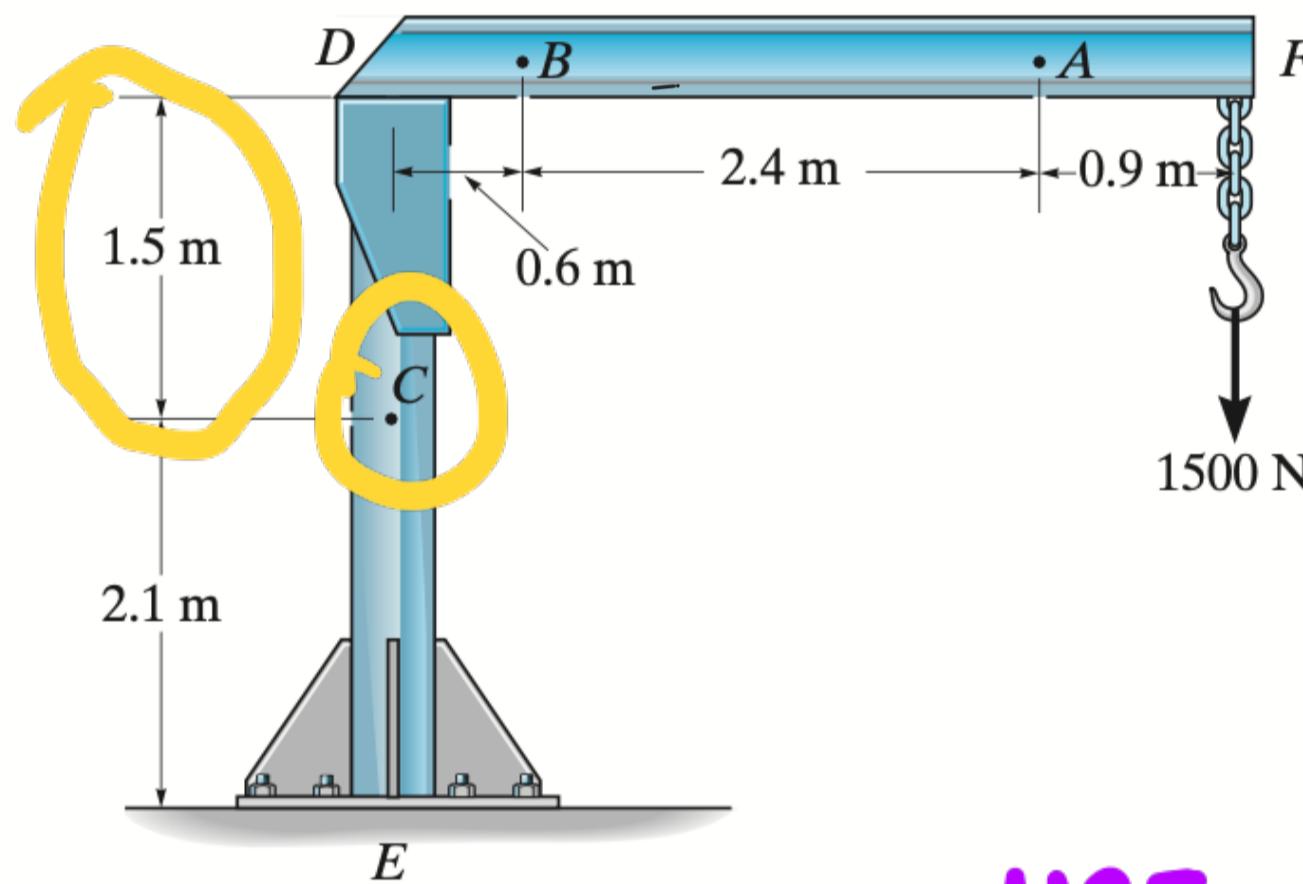
!!



Esempio

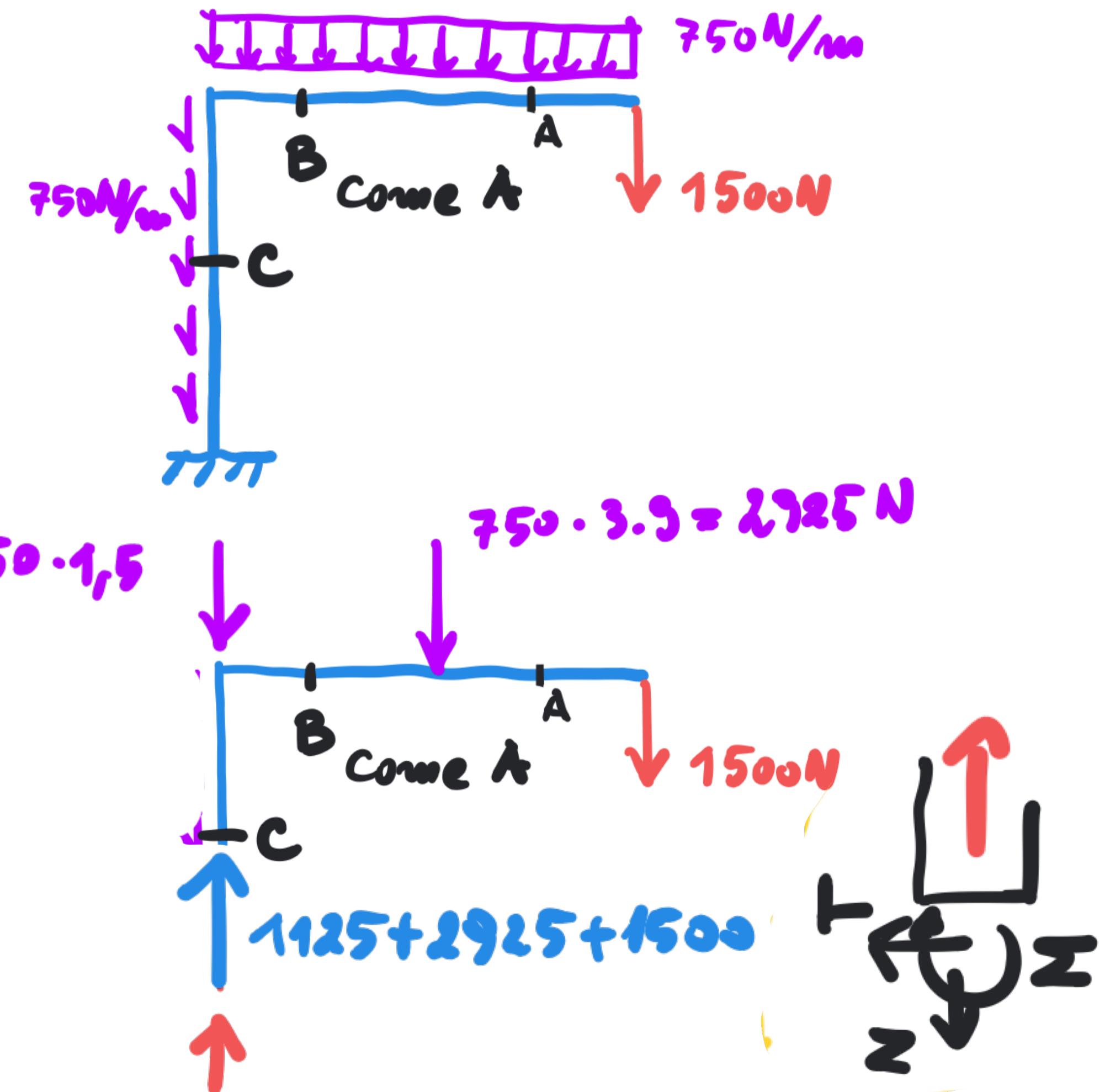
La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m . Il carico pesa 1500 N .

Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .



$$N = -5550$$

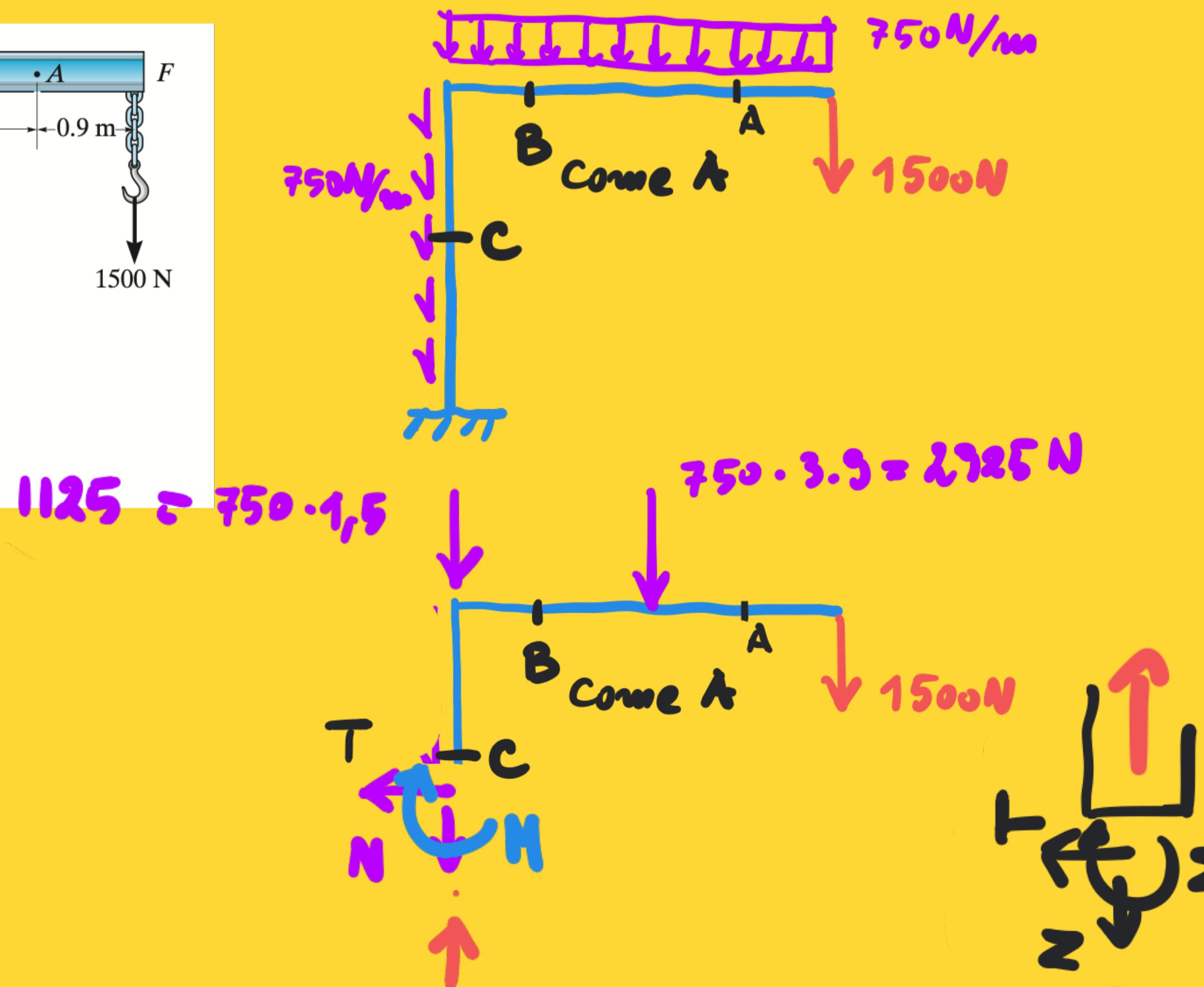
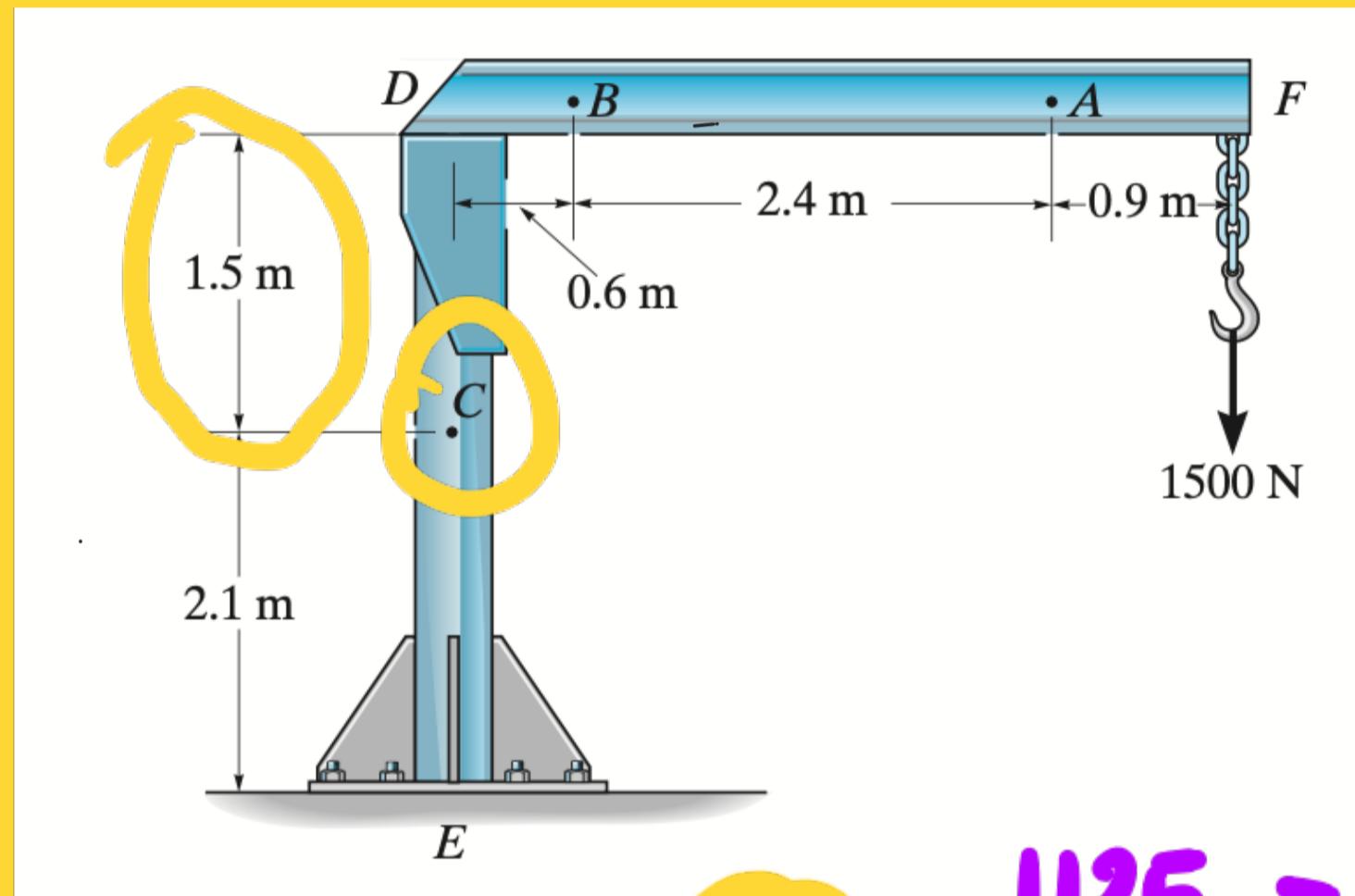
$$N = -$$



Esempio

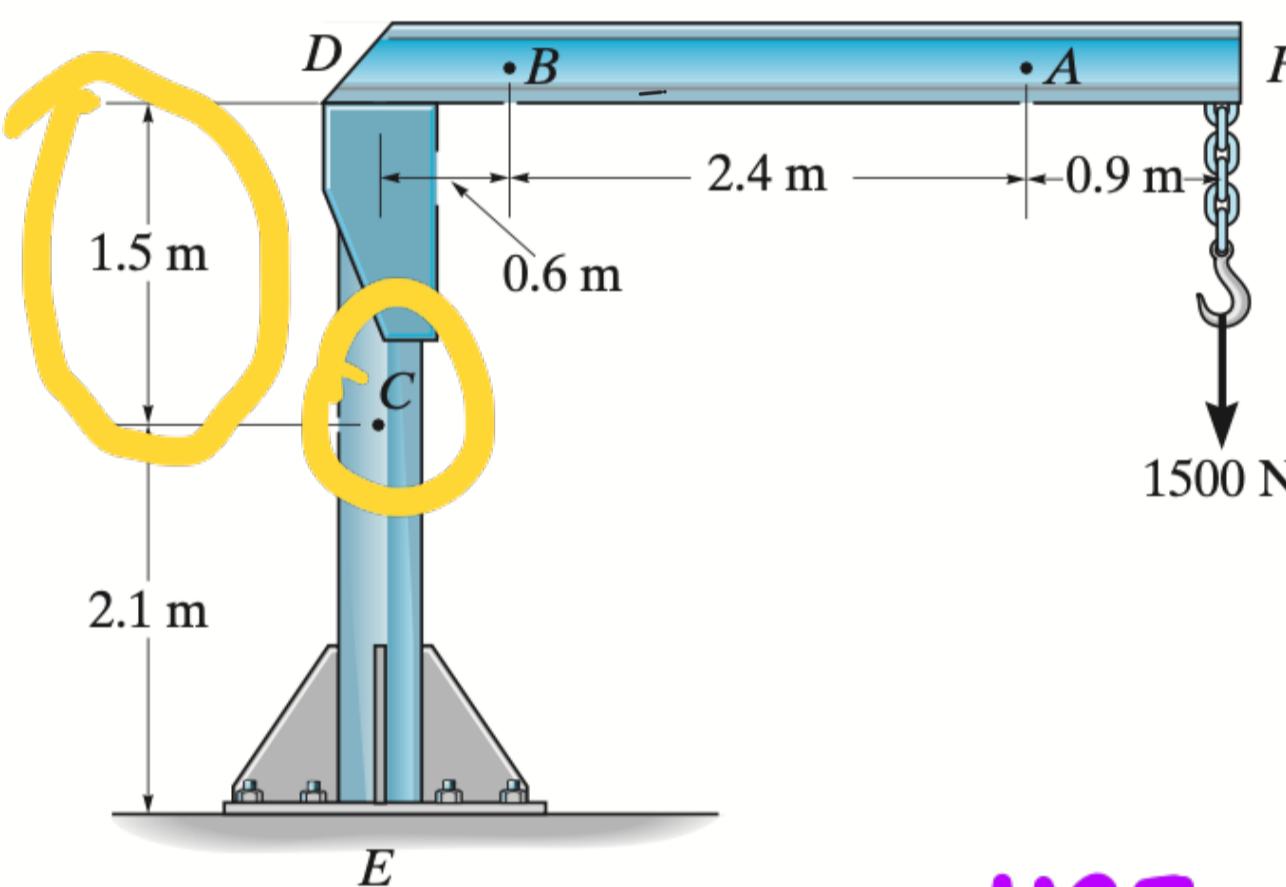
La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m . Il carico pesa 1500 N .

Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .



Esempio

$$+ d = 3.9 h =$$



$$T=0$$

$$N=-5550 \text{ N}$$

$$5 \sum M_c = 0$$

$$\begin{aligned} -M - 2925 \cdot 1,950 \text{ N} \cdot \text{m} \\ - 1500 \cdot 3,7 \text{ N} \cdot \text{m} = \dots \end{aligned}$$

La trave DF della gru e la colonna DE hanno un peso uniforme di 750 N/m. Il carico pesa 1500 N.

Determinare le sollecitazioni interne risultanti nella gru nelle sezioni trasversali passanti per i punti A , B e C .

