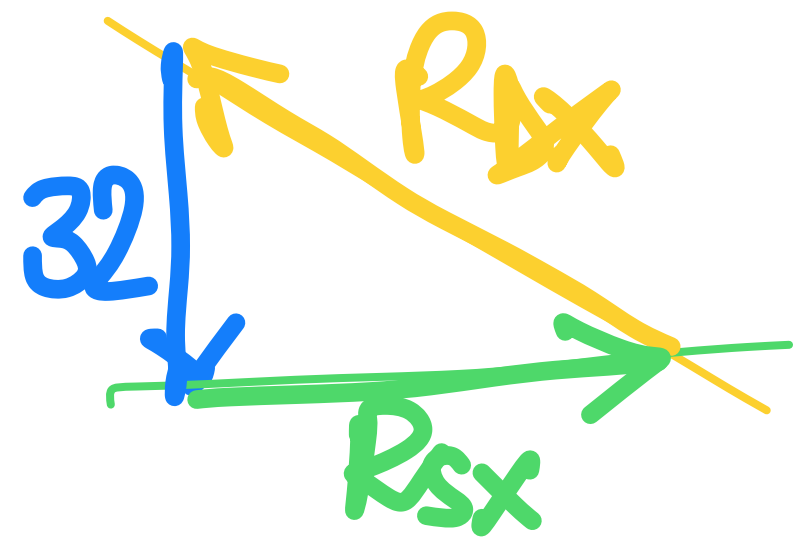
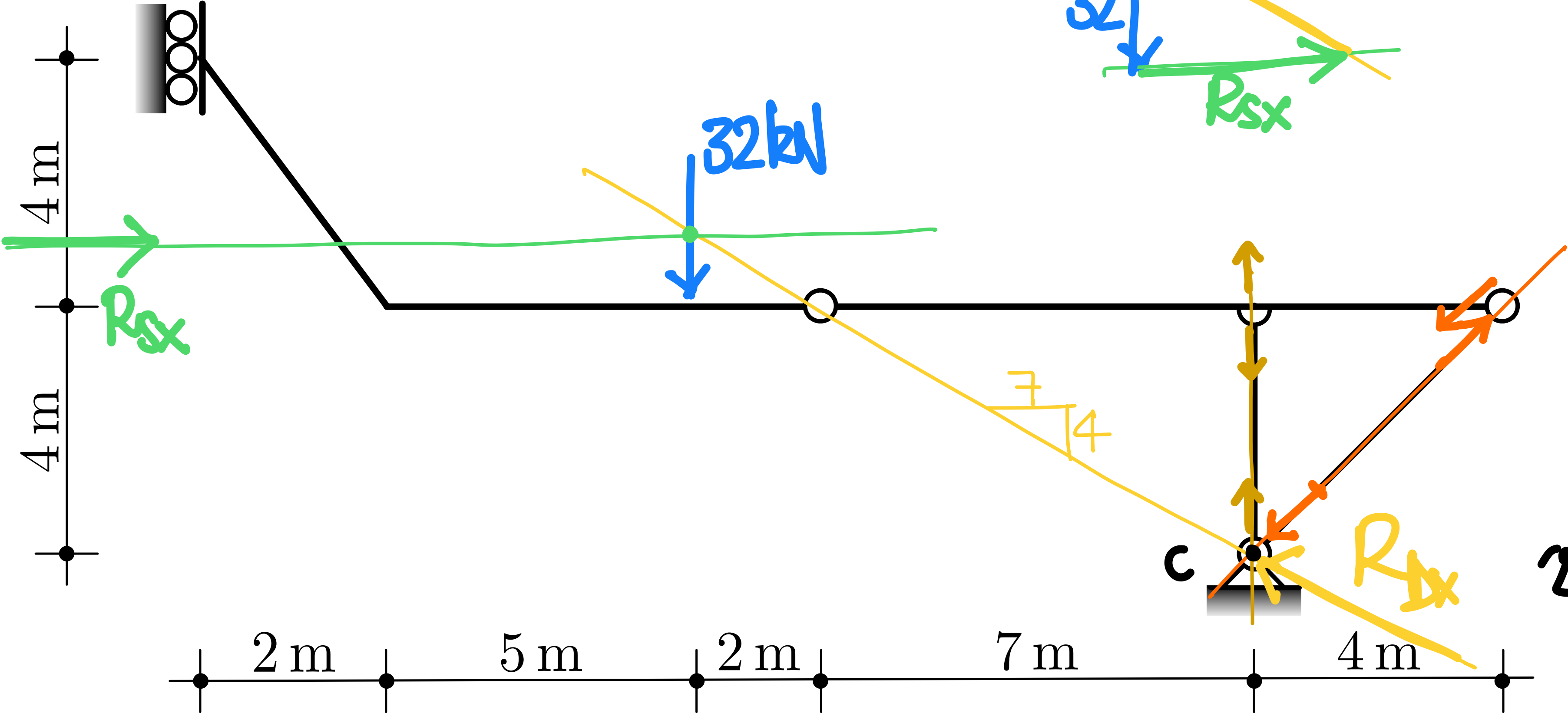
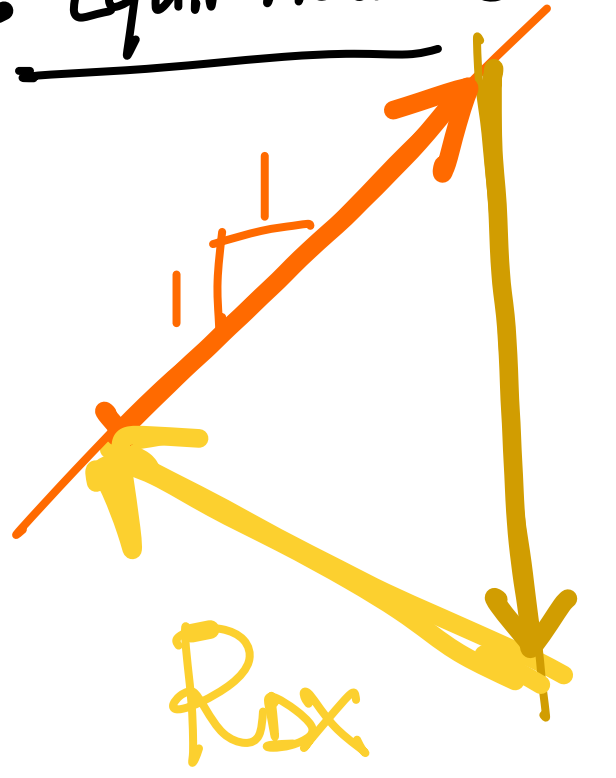


Approccio Statico
Schema 0: reazioni vincolari

1. Equil. globale

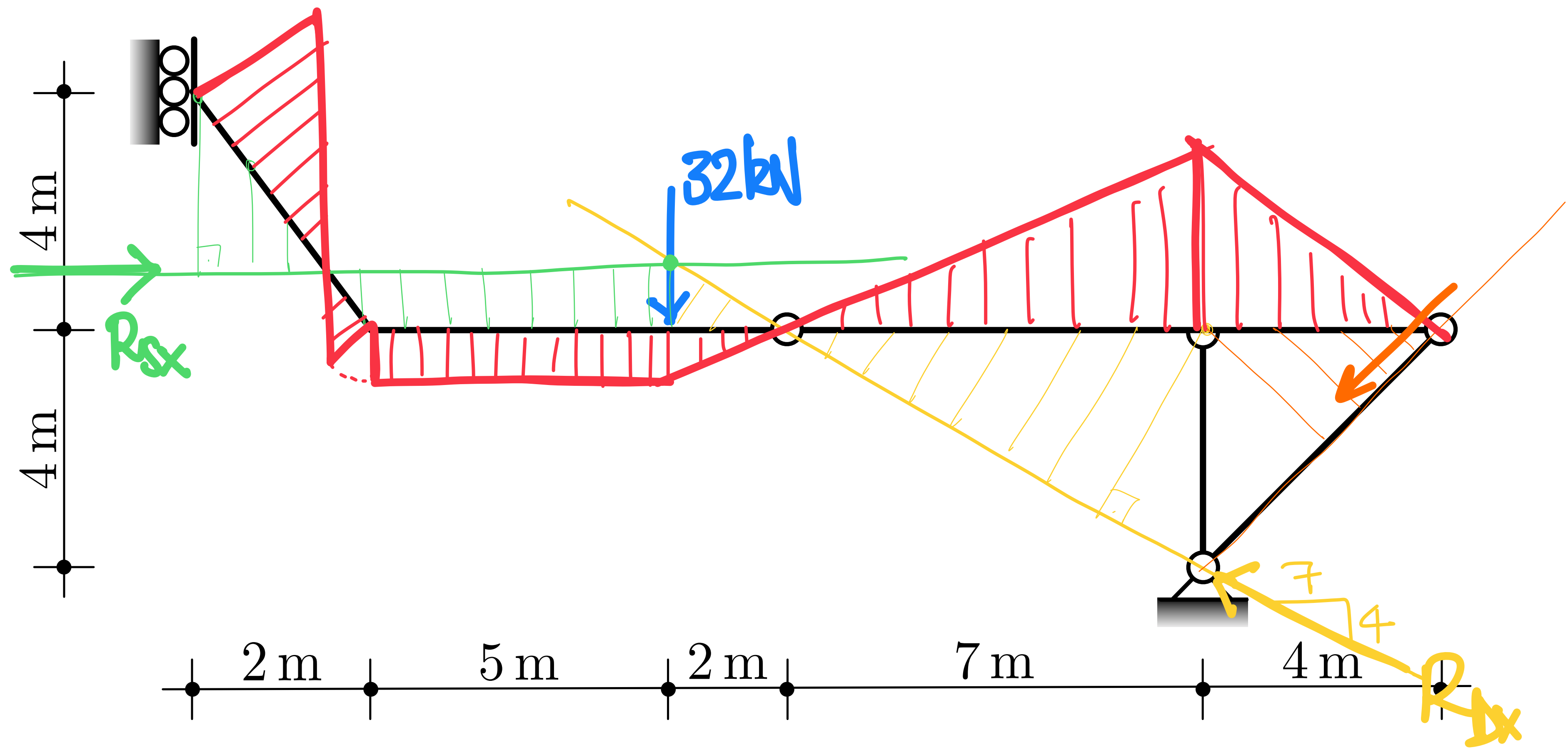


2. Equil nodo C



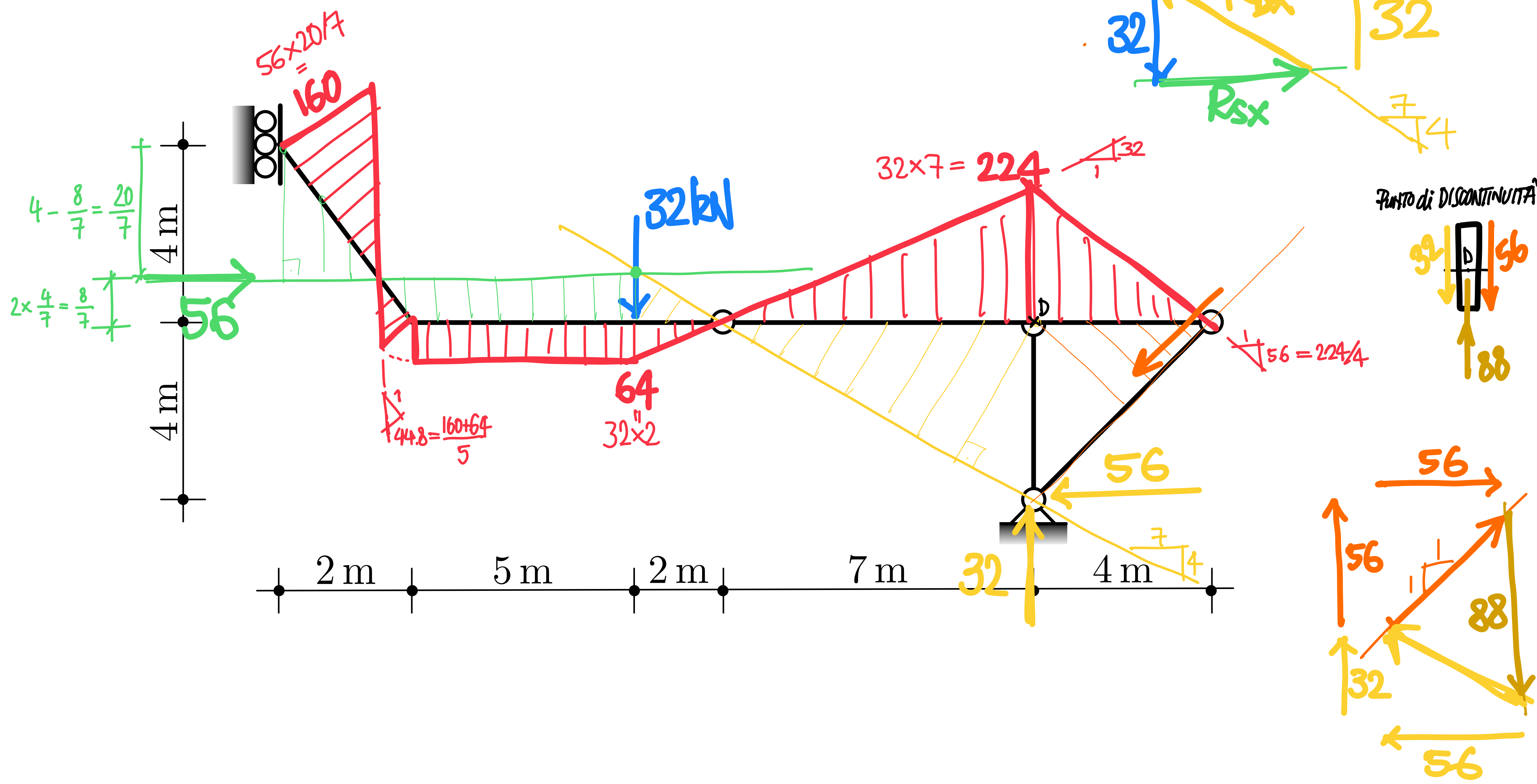
Approccio Statico

Schema 0: diagramma dei momenti qualitativo M_0



Approccio Statico

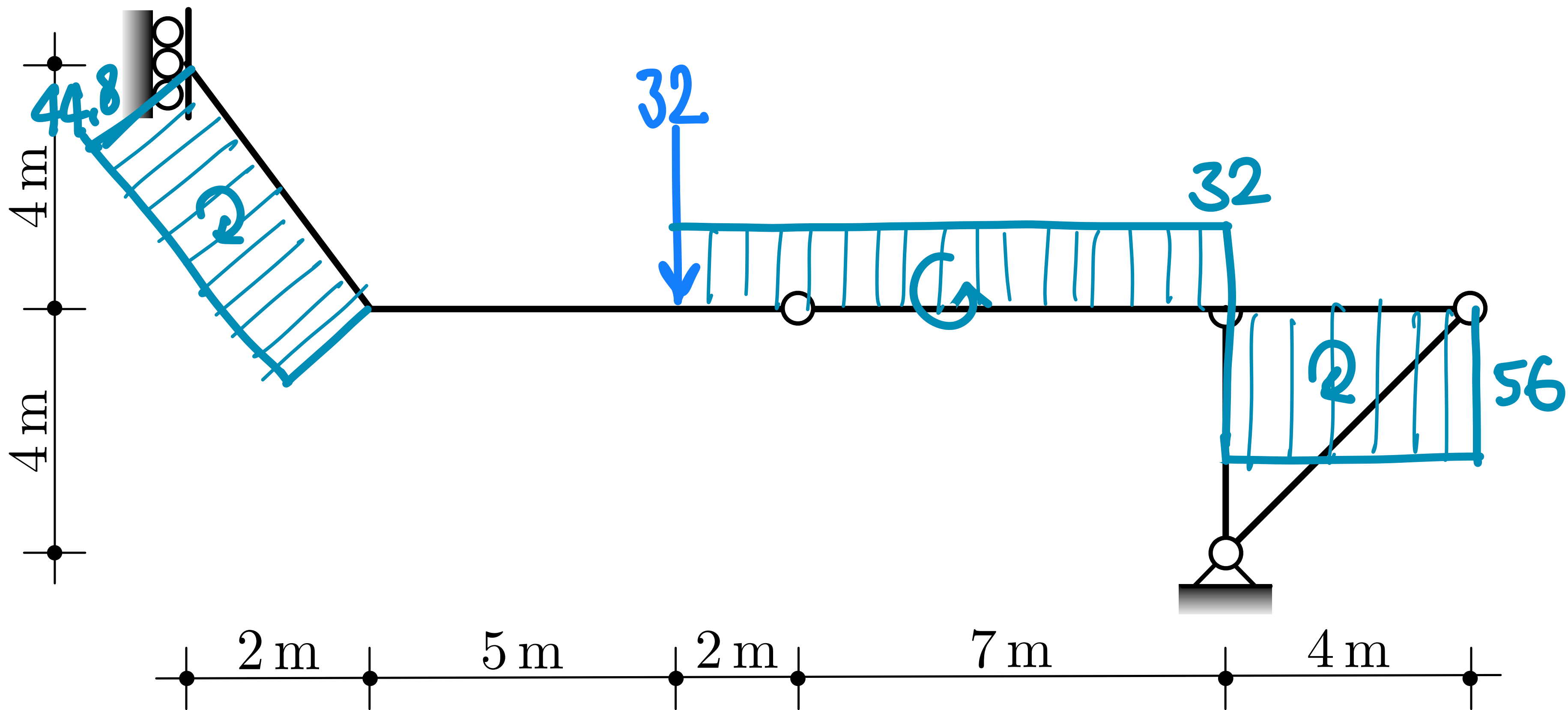
Schema 0: diagramma dei momenti M_0



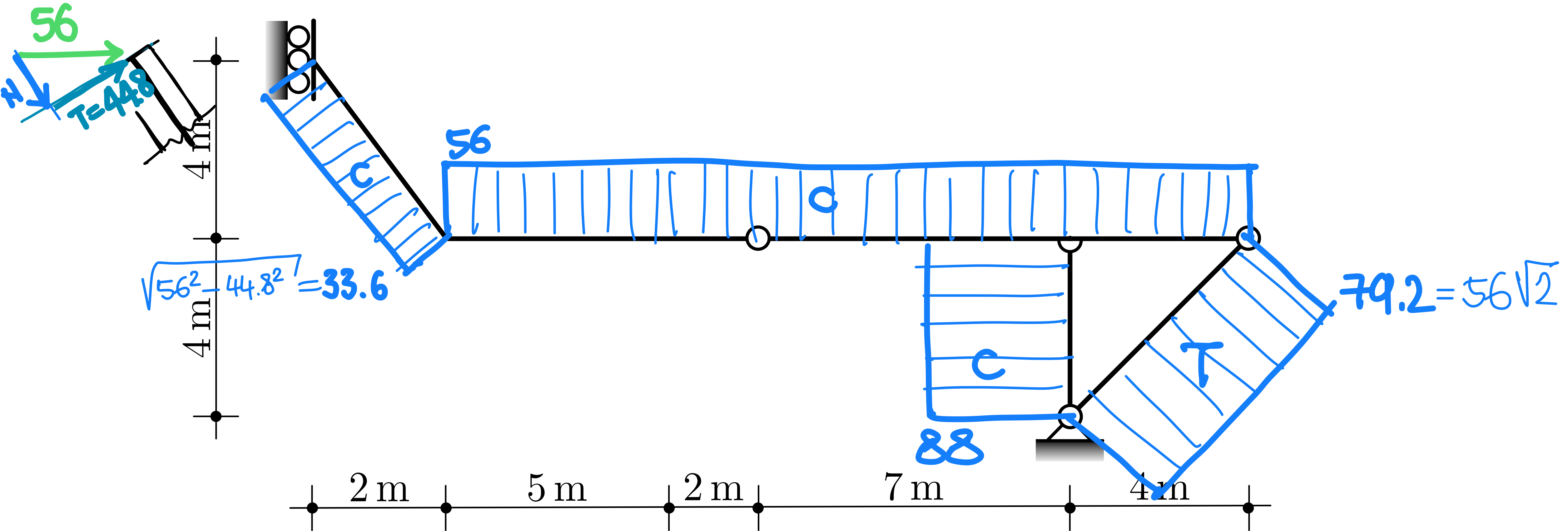
Approccio Statico

Schema 0: diagramma degli sforzi di taglio T_0

T_0

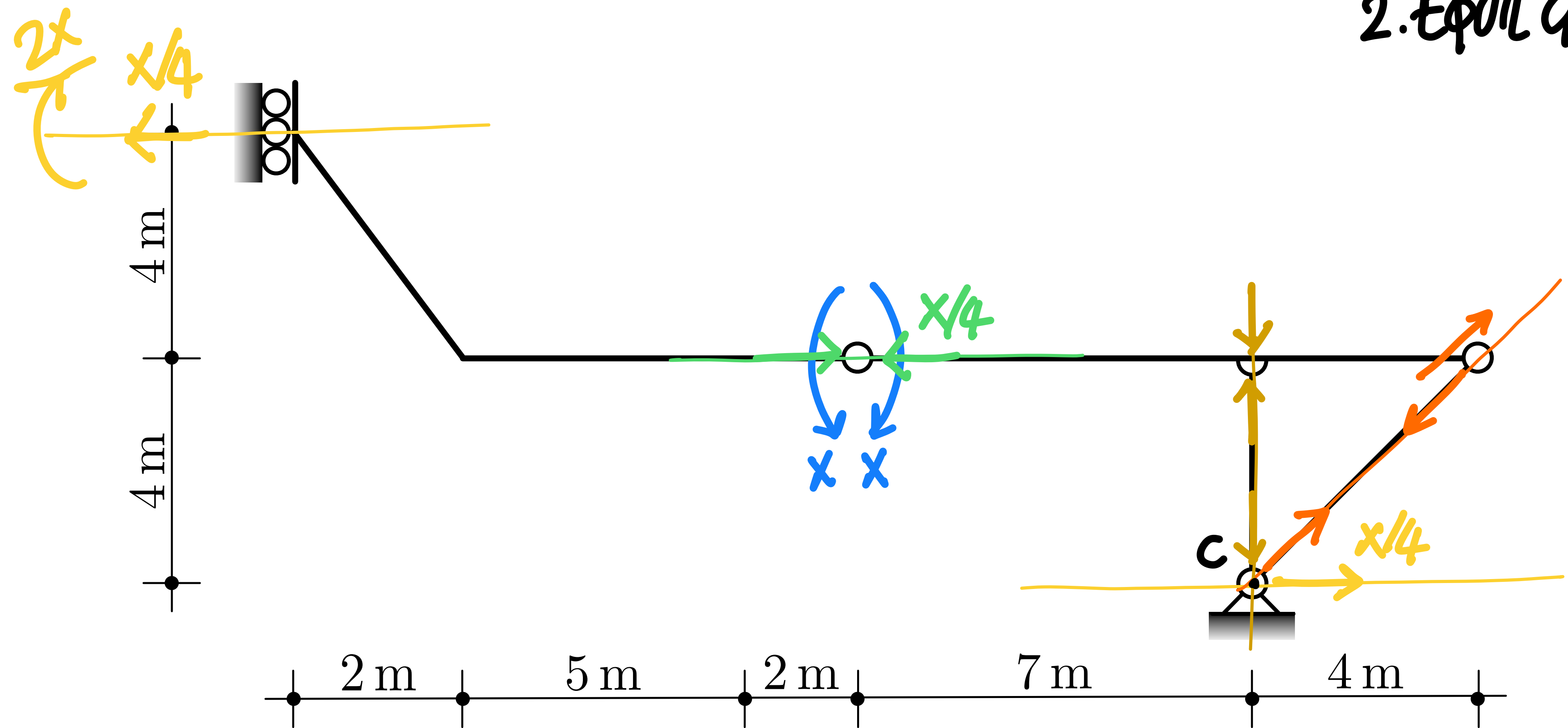


Approccio Statico
Schema 0: diagramma degli sforzi normali *N0*

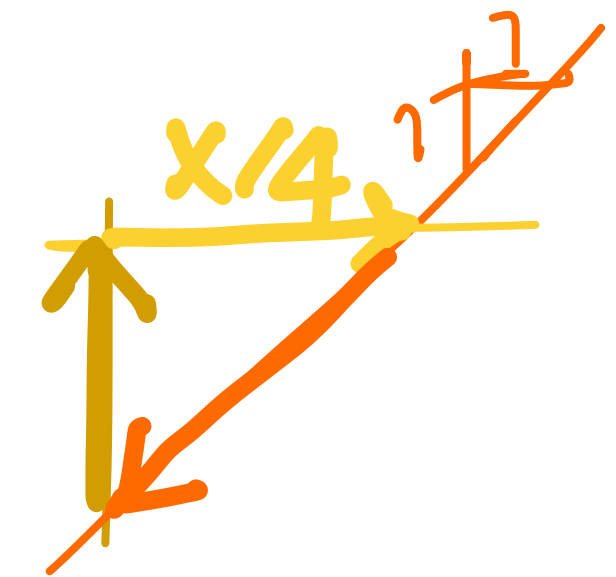


Approccio Statico
Schema X: reazioni vincolari

1. EQUIL. LOCALE BX
2. EQUIL. GLOBALE

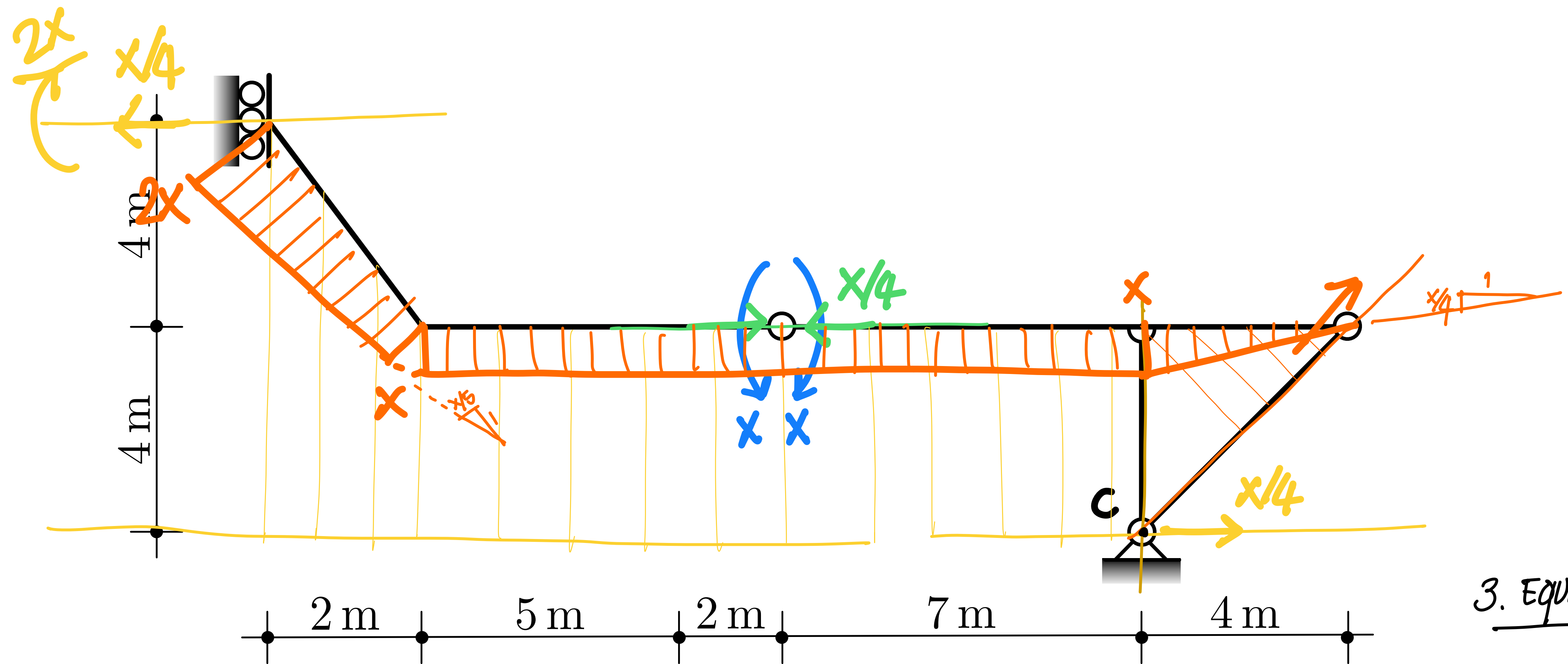


3. EQUIL. NODO C

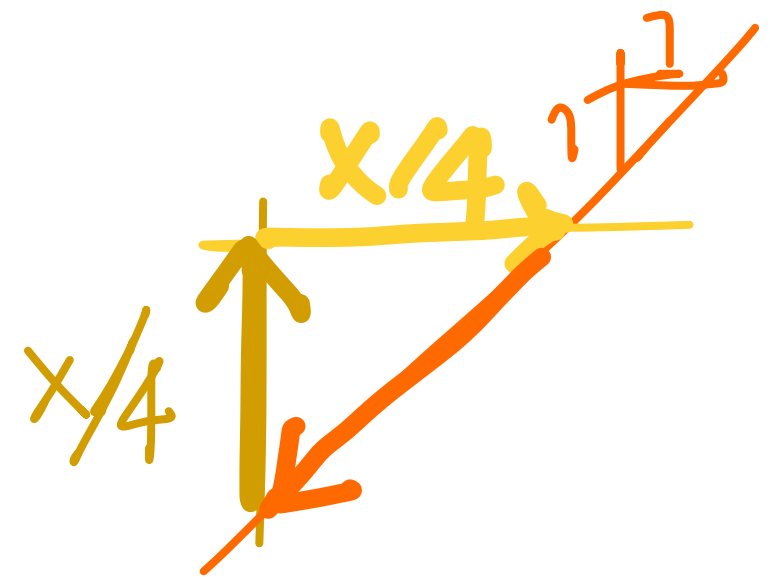


Approccio Statico

Schema X: diagramma dei momenti qualitativo M_x



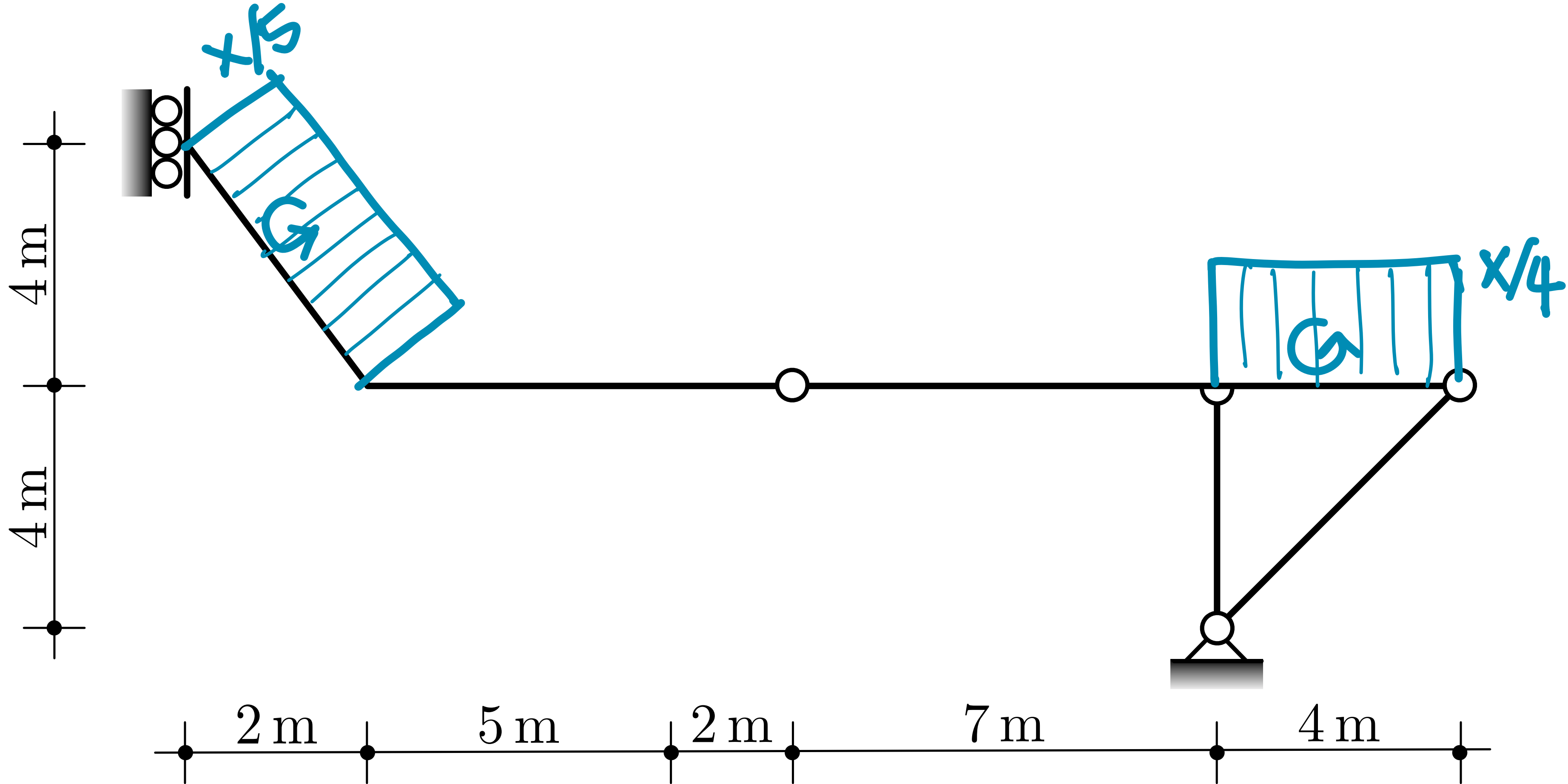
3. Equil. noddOC



Approccio Statico

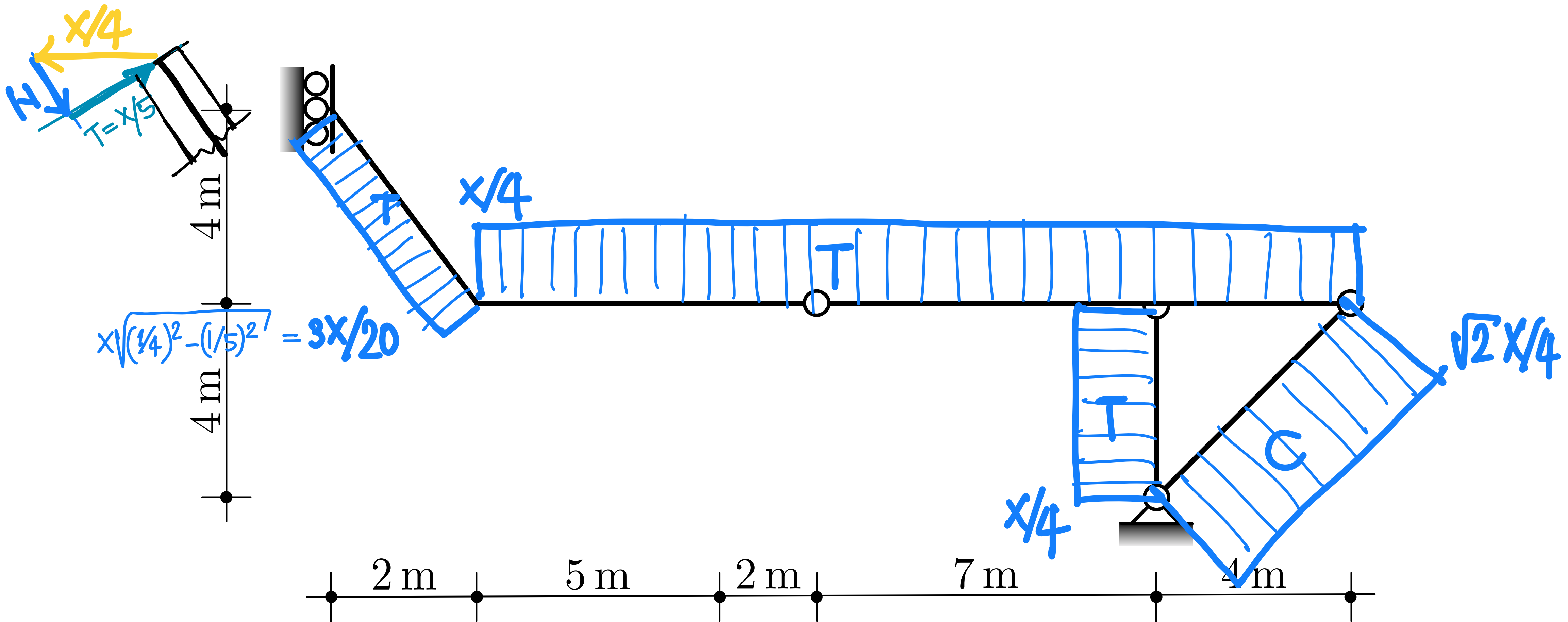
Schema X: diagramma degli sforzi di taglio T_x

T_x



Approccio Statico

Schema X: diagramma degli sforzi normali 



Approccio Statico
Schema iperstatico

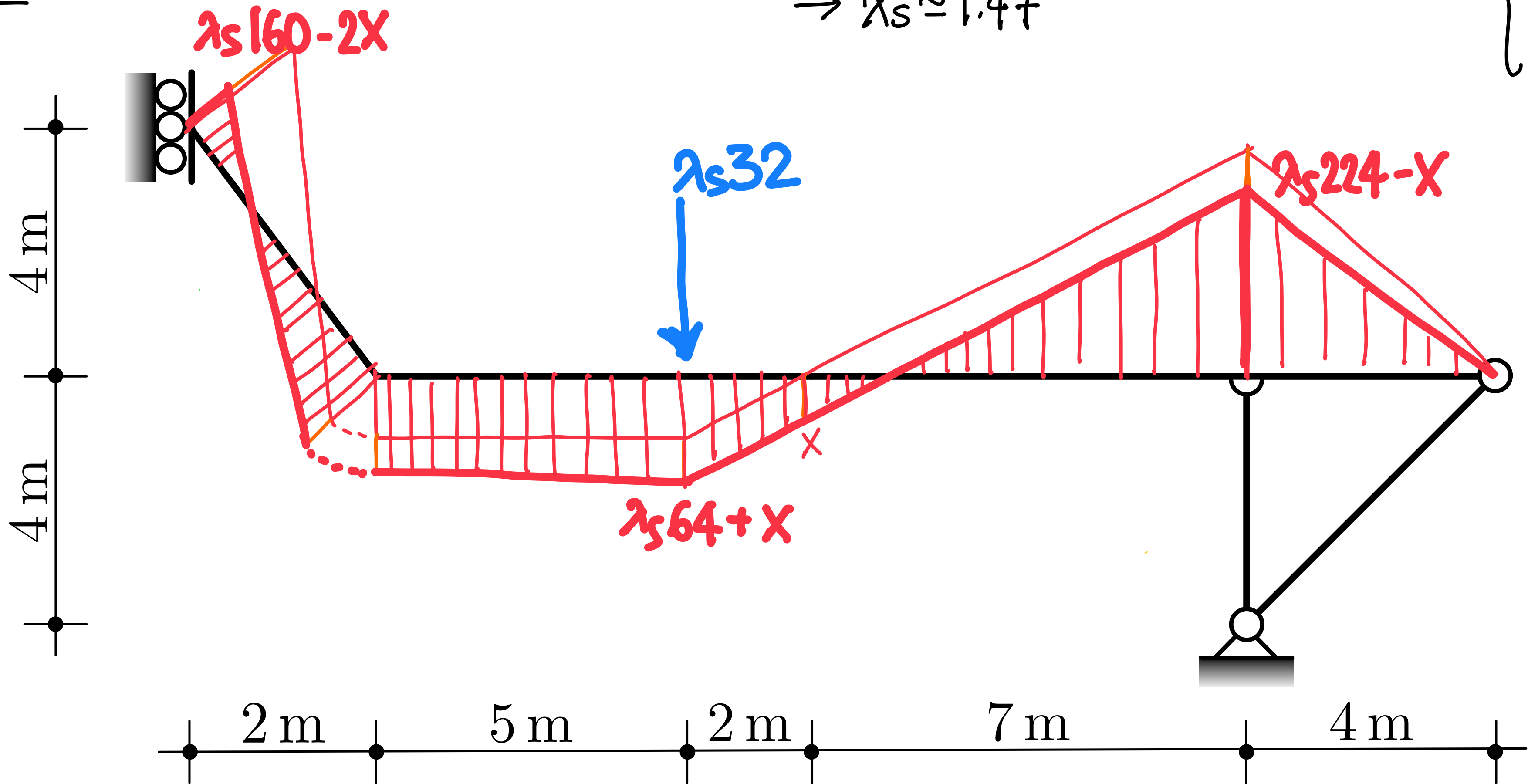
$M_u = 330 \text{ kN}\cdot\text{m}$

IPOTESI 1 : $\lambda_{s224} = 330$
 $\rightarrow \lambda_s \approx 1.47$

IPOTESI 2 : $\begin{cases} \lambda_{s224-X} = 330 \\ \lambda_{s64+X} = 330 \end{cases}$

$\rightarrow \lambda_s = \frac{55}{24} \approx 2.29$
 $X = \frac{5}{9} M_u = 183.34$

verifica:
 $\lambda_{s160-2X} =$
 $2.29 \times 160 - 2 \times 183.34$
 $= 0 < 330$



PROGETTO

$W_{min} = \frac{224 \text{ kN}\cdot\text{m}}{150 \text{ MPa}} = \frac{224 \times 100 \times 100 \times 100 \text{ kN}\cdot\text{cm}^3}{150 \times 1000 \text{ kN}} \approx 1493 \text{ cm}^3$

\rightarrow **IPE 500**
 $A = 116 \text{ cm}^2$
 $W_z = 1930 \text{ cm}^3$
 $S_{xz}(A/2) = 1100 \text{ cm}^3$

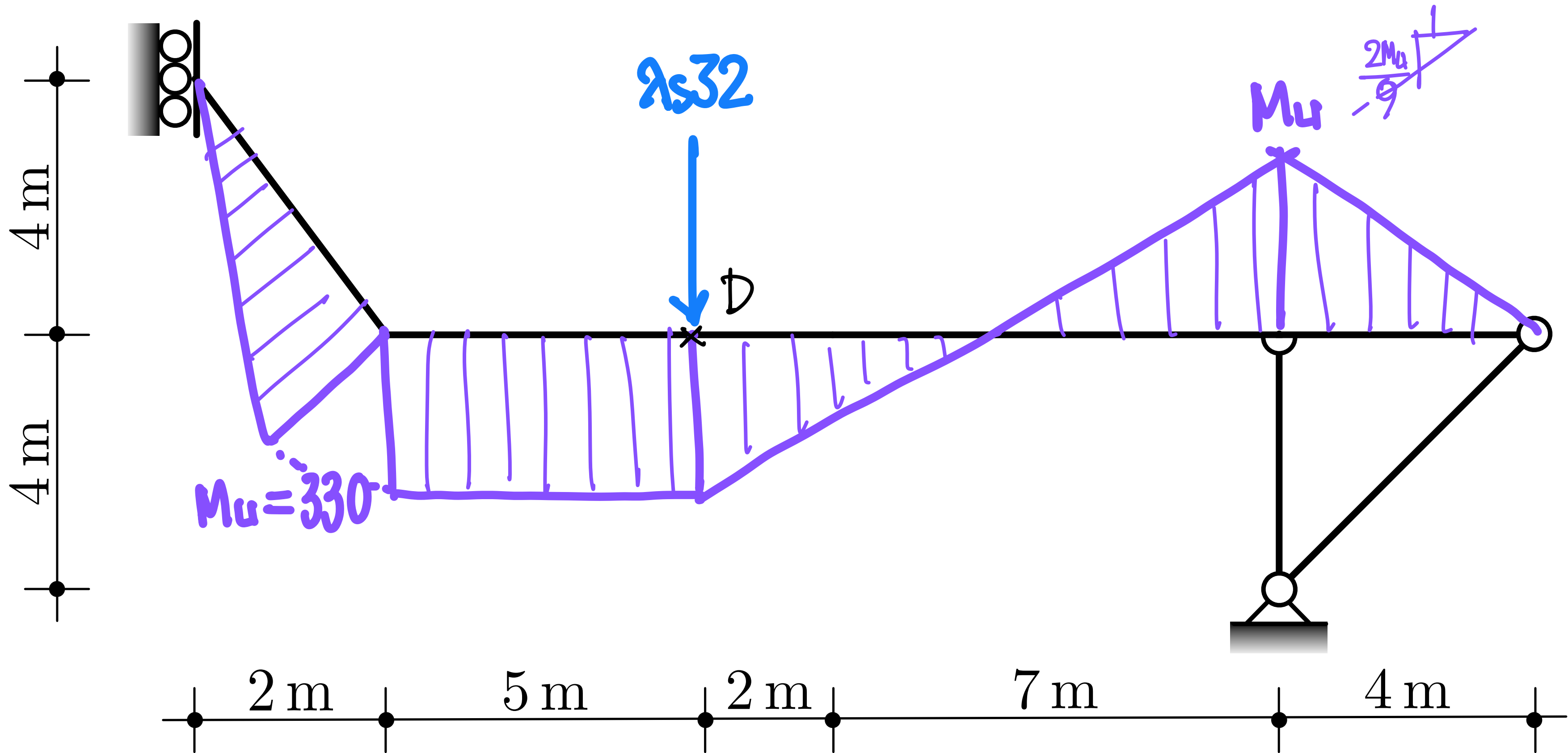
VERIFICA

$\sigma_{max} = \frac{56 \text{ kN}}{116 \text{ cm}^2} + \frac{224 \text{ kN}\cdot\text{m}}{1930 \text{ cm}^3} = 120.89 < 150 \text{ MPa}$
 $= (4.83 + 116.06) \cdot 1000 \text{ kN/m}^2$

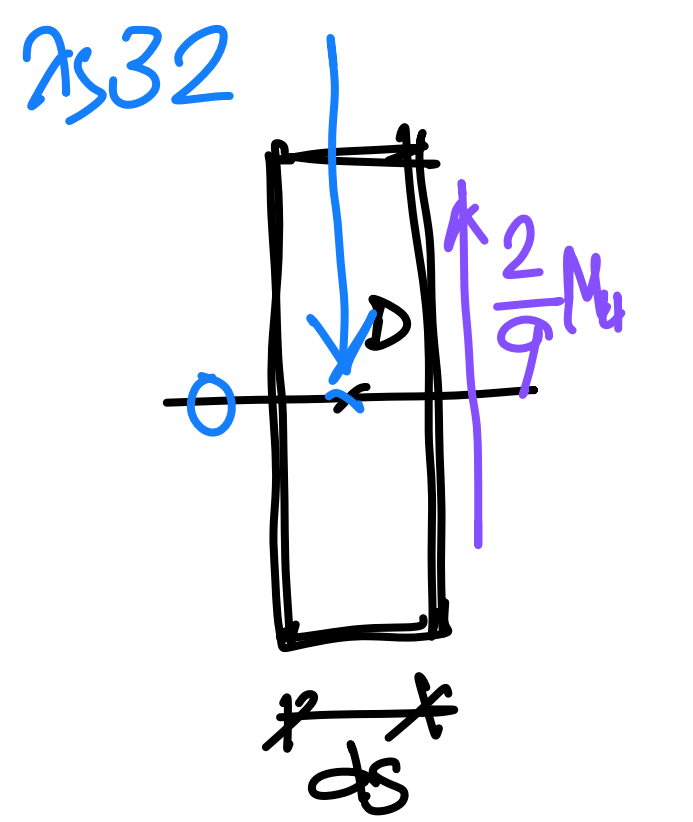
$M_u = 2 S_x (A/2) \sigma_{amm} = 330 \text{ kN}\cdot\text{m}$
 $= \frac{2 \times 1100 \text{ cm}^3 \times 150 \text{ MPa}}{100 \times 100 \times 100} \text{ kN}\cdot\text{m}$

Approccio Statico
Soluzione ammissibile per stima del collasso

$\lambda_s = \frac{55}{24} \approx 2.29$



EQUIL al nodo D



$\lambda_{s32} = \frac{2}{9} 330$

$\rightarrow \lambda_s = \frac{55}{24} \checkmark$

Approccio Cinematico

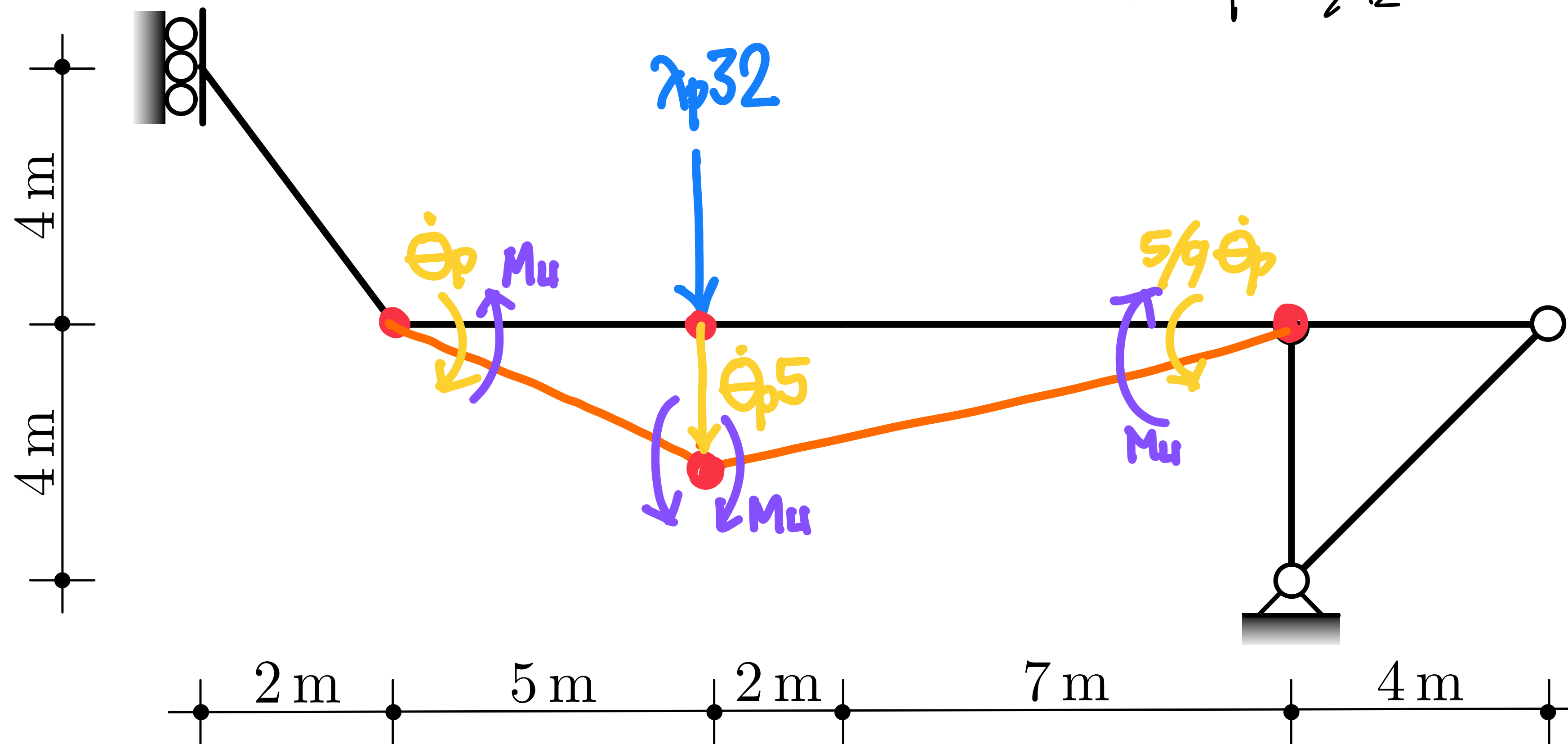
Soluzione ammissibile: meccanismo di collasso

$$\underline{M_u = 330 \text{ kN}\cdot\text{m}}$$

IPOTESI di COLASSO LOCALE

$$\lambda_p 32 \times \dot{\Theta}_p 5 - M_u (1 + (1 + 5/9) + 5/9) \dot{\Theta}_p = 0$$

$$\Rightarrow \lambda_p = \frac{77}{12} \cong 6.42$$



Approccio Cinematico

Soluzione ammissibile: meccanismo di collasso

$M_u = 330 \text{ kN}\cdot\text{m}$

IPOTESI 2

$$\lambda_p 32 \times \dot{\theta}_p - M_u (1 + 1) \dot{\theta}_p = 0$$

$$\Rightarrow \lambda_p = \frac{55}{24} \cong 2.29$$

$\Rightarrow \lambda_s = \lambda_p = \lambda_c = 2.29$

