

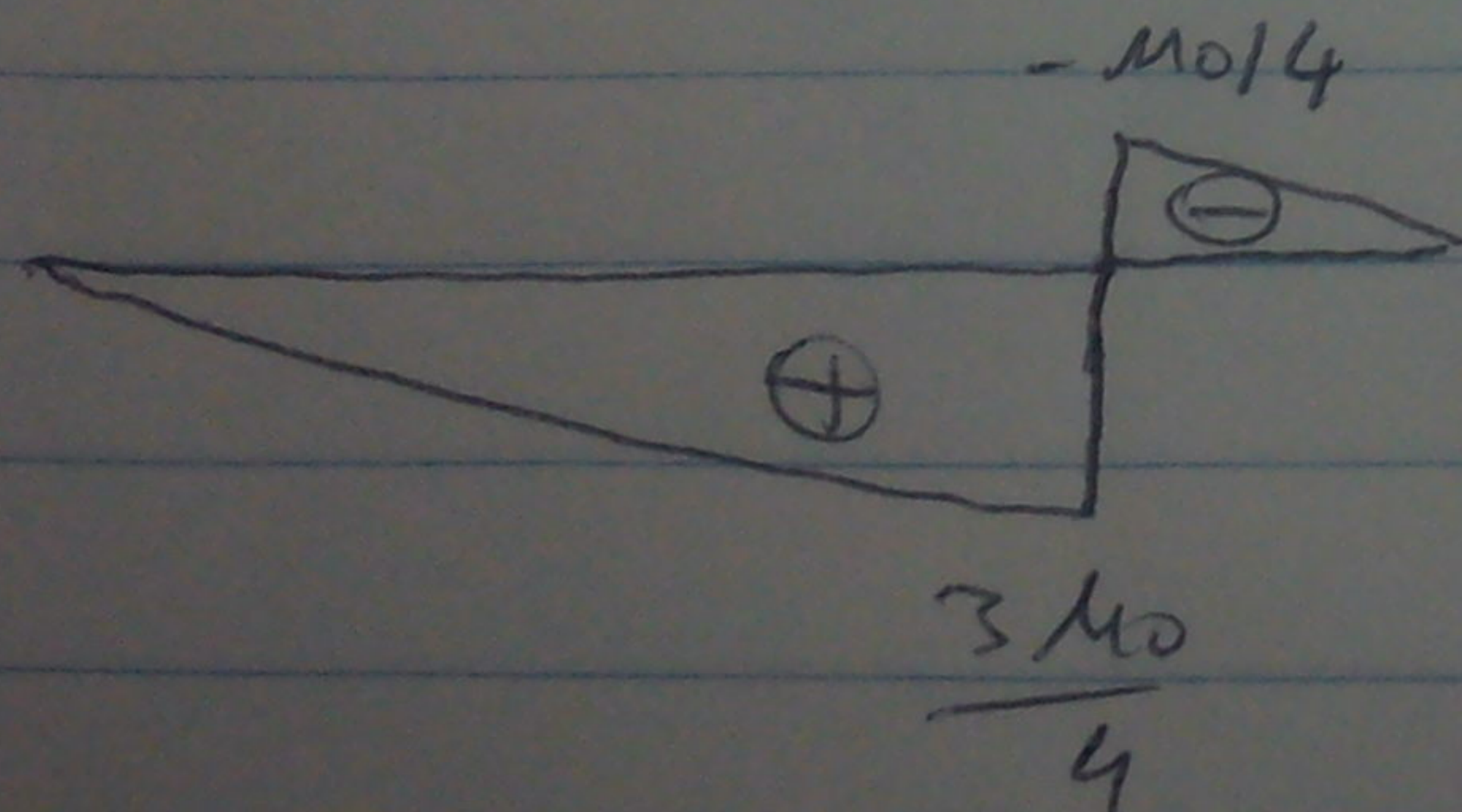
$$\begin{aligned} \sum F_x = 0 &\Rightarrow H_A = 0 \\ \sum F_y = 0 &\Rightarrow V_A = -V_B \\ \sum M_A = 0 &\Rightarrow -M_0 - V_B \cdot L = 0 \end{aligned}$$

$$\begin{aligned} \text{At } A: \quad V_B &= -\frac{M_0}{L} \\ \text{At } B: \quad V_A &= \frac{M_0}{L} \end{aligned}$$

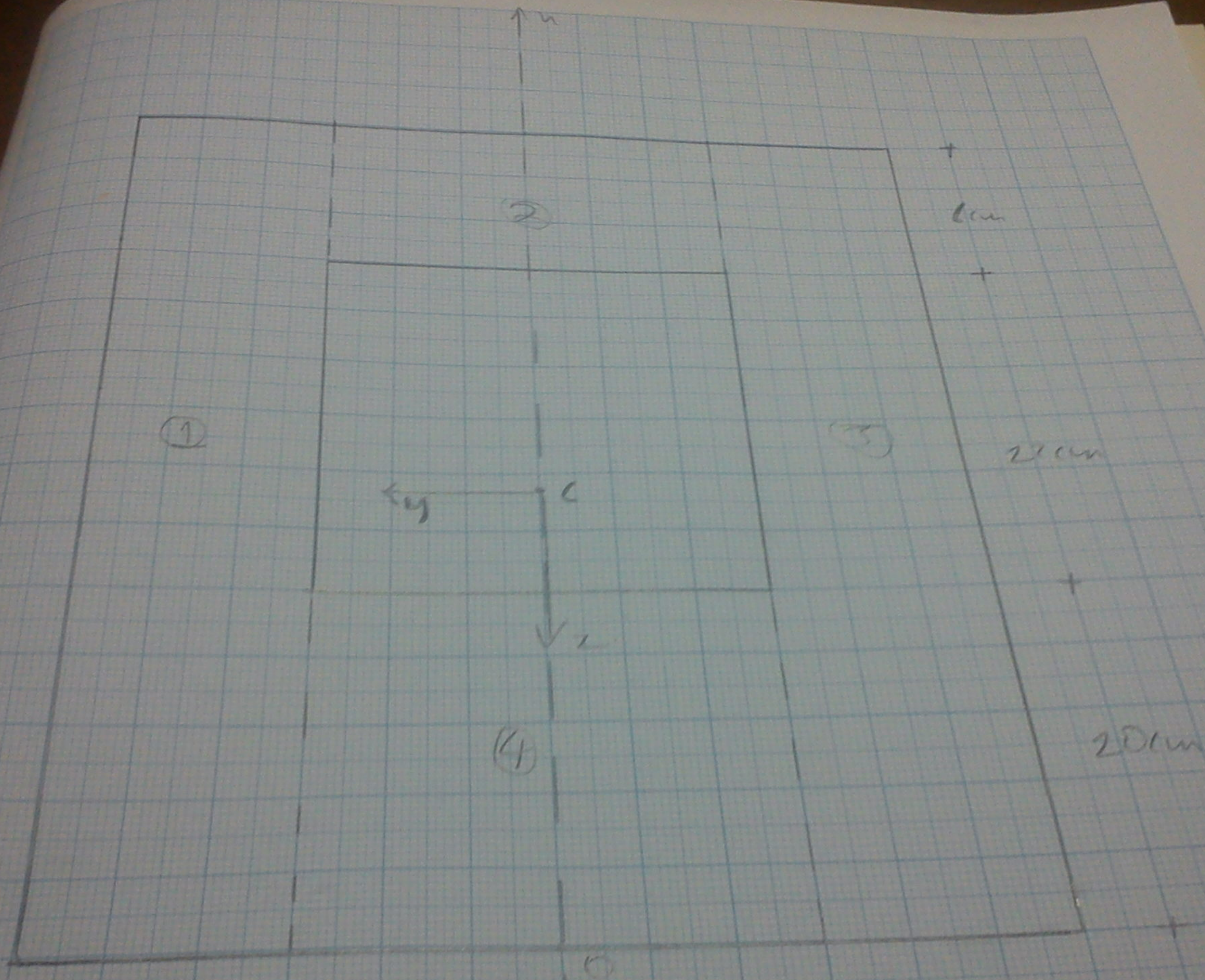
$$0 \leq x \leq \frac{3L}{4} \quad M(x) = V_A x = \frac{M_0}{L} \cdot x \quad M(0) = 0 \quad M\left(\frac{3L}{4}\right) = \frac{3}{4} M_0$$

$$\frac{3L}{4} \leq x \leq L \quad M(x) = V_A x - M_0 = \frac{M_0}{L} x - M_0$$

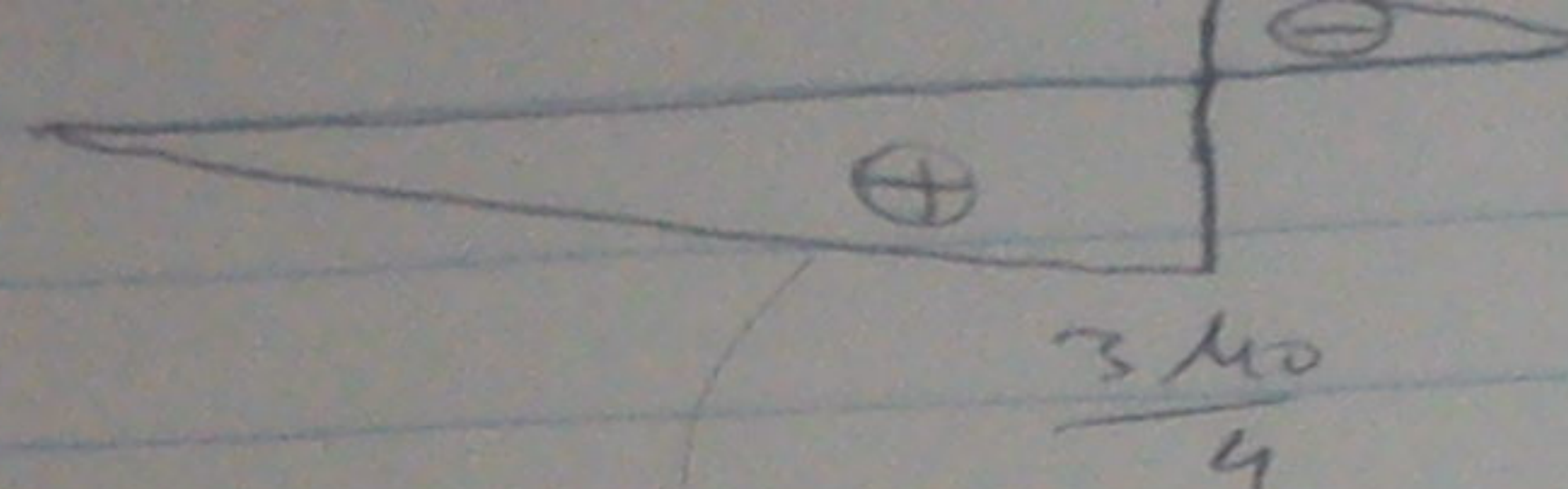
$$M\left(\frac{3L}{4}\right) = -\frac{1}{4} M_0 \quad M(L) = 0$$



$\sum F_x = 0 \Rightarrow$
 $\sum F_y = 0 \Rightarrow$
 $\sum M_A = 0 \Rightarrow$
 $M(0) =$
 $\frac{M_0 x}{2}$



x 6cm x 22cm x 6cm x



$$I_y = I_1 + I_2 + I_3 + I_4$$

$$O_c = \frac{5 \cdot 220 + 24 \cdot 268 + 25 \cdot 72 + 24 \cdot 268}{220 + 268 + 72 + 268} \approx 23,45 \text{ cm}$$

$$I_y^{(2)} = \frac{1}{22} \cdot 6 \cdot 28^3 + 268 \cdot (24 - 23,45)^2 = 22026,82 \text{ cm}^4 = I_y^{(3)}$$

$$I_y^{(2)} = \frac{1}{22} \cdot 22 \cdot 6^3 + 72 \cdot (75 - 23,45)^2 = 9820,98 \text{ cm}^4$$

$$I_y^{(4)} = \frac{1}{22} \cdot 22 \cdot 20^3 + 220 \cdot (23,45 - 5)^2 = 9568,3 \text{ cm}^4$$

$$I_y = 43447,92 \text{ cm}^4$$

Έχουμε μέγιστη εφελκυστική ροπή $0,75 \text{ Mo}$

Η μέγιστη εφελκυστική τάση εμφανίζεται στο κάτω πλάτος

της δεξιάς άρα $z = 23,45 \text{ cm}$

$$\sigma_{\pi} \leq 20 \text{ MPa} \Rightarrow \frac{0,75 M_0 \cdot z}{I_y} \leq 20 \text{ MPa} \Rightarrow$$

$$\frac{0,75 \cdot M_0 \cdot 23,45 \text{ cm}}{43442,97 \text{ cm}^4} \leq 1 \frac{\text{N}}{\text{cm}^2} \Rightarrow$$

$$M_0 \leq 43,07 \text{ kNm}$$

Η μέγιστη θλιπτική ροπή είναι $-0,75 M_0$

Η μέγιστη θλιπτική τάση εμφανίζεται στο άνω τμήμα της δοκού

$$\text{όπου } z = -(28 - 13,45) = -24,55 \text{ cm}$$

$$\sigma_{\pi} \leq 20 \text{ MPa} \Rightarrow$$

$$\frac{-0,75 M_0 \cdot (-24,55) \text{ cm}}{43442,97 \text{ cm}^4} \leq 0,2 \frac{\text{N}}{\text{cm}^2} \Rightarrow$$

$$3,6375 M_0 \leq 8688,584 \text{ kN} \cdot \frac{\text{cm}}{\text{cm}^4} \Rightarrow M_0 \leq 23,89 \text{ kNm}$$

$$\text{Άρα } M_{\max} = 23,89 \text{ kNm}$$