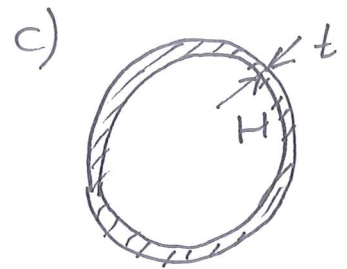
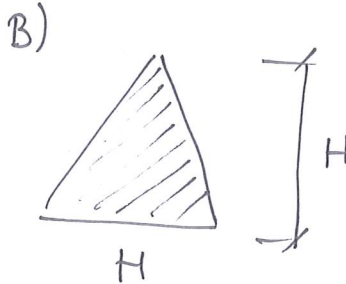
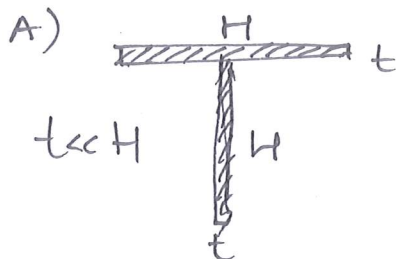


2.4. 39

GIVET:

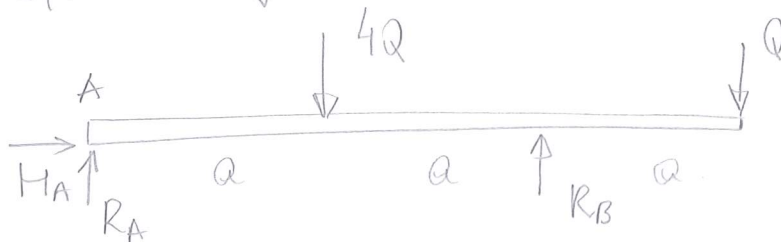


SÖKT: Bestäm σ_{\max} och σ_{\min}



LÖSNING:

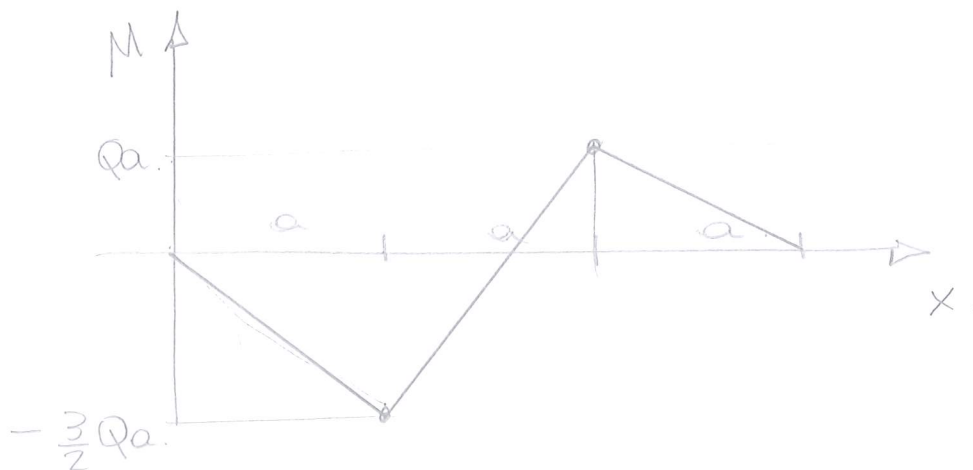
1- Global fmv.



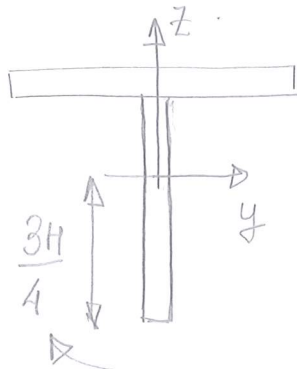
$$H_A = 0$$

$$\sum \mathcal{M}_A: a \cdot 4Q - 2a R_B + 3a Q = 0 \Rightarrow \underline{\underline{R_B = \frac{7}{2} Q}}$$

$$\uparrow: R_A - 4Q + R_B = 0 \quad \underline{\underline{R_A = \frac{3}{2} Q}}$$



A)



$$I_y = \frac{tH^3}{12} + Ht\left(\frac{H}{4}\right)^2 + Ht\left(\frac{H}{4}\right)^2$$

$$= \frac{2H^3t}{24} + 2 \cdot \frac{3 \cdot H^3t}{24}$$

$$I_y = \frac{5tH^3}{24}$$

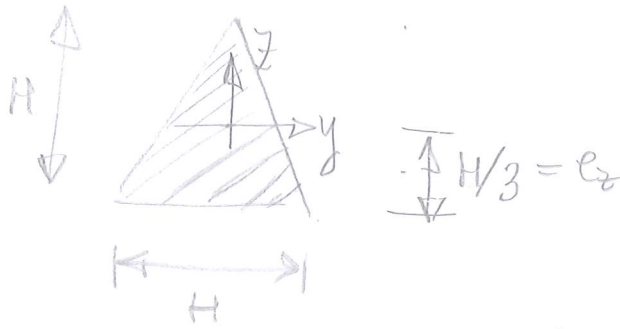
$$e_z = H \cdot \frac{Ht + tH/2}{H \cdot t + Ht} = \frac{H \cdot 3}{4}$$

$$x = a \Rightarrow \begin{cases} \tau_{\max} = \frac{(-3Qa/2)(-3H/4)}{5tH^3/24} = \frac{27Qa}{5tH^2} \\ \tau_{\min} = \frac{(-3Qa/2)(H/4)}{5tH^3/24} = -\frac{9Qa}{5tH^2} \end{cases}$$

$$x = 2a \Rightarrow \begin{cases} \tau_{\max} = \frac{(Qa)(H/4)}{5tH^3/24} = \frac{6Qa}{5tH^2} \\ \tau_{\min} = \frac{(Qa)(-3H/4)}{5tH^3/24} = -\frac{18Qa}{5tH^2} \end{cases}$$

$\tau_{\max} = \frac{27Qa}{5tH^2}$ <p style="text-align: center; margin: 0;"> $x = a$ $z = -3H/4$ </p>	$\tau_{\min} = -\frac{18Qa}{5tH^2}$ <p style="text-align: center; margin: 0;"> $x = 2a$ $z = -3H/4$ </p>
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B).



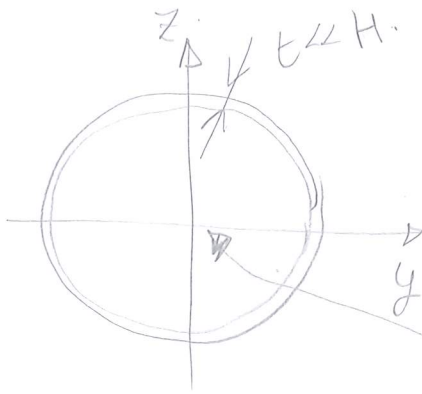
$$I_y = \frac{H^4}{36}$$

$$x = a \quad \left\{ \begin{array}{l} \tau_{\max} = \frac{(-3Qa/2)(-H/3)}{H^4/36} = \frac{18Qa}{H^3} \\ \tau_{\min} = \frac{(-3Qa/2)(2H/3)}{H^4/36} = -\frac{36Qa}{H^3} \end{array} \right.$$

$$x = 2a \quad \left\{ \begin{array}{l} \tau_{\max} = \frac{(Qa)(2H/3)}{H^4/36} = \frac{24Qa}{H^3} \\ \tau_{\min} = \frac{(Qa)(-H/3)}{H^4/36} = -\frac{36Qa}{3H^3} \end{array} \right.$$

$\tau_{\min} = \frac{-36Qa}{H^3}$ <p style="text-align: center;"> $x = a$ $z = 2H/3$ </p>	$\tau_{\max} = \frac{24Qa}{H^3}$ <p style="text-align: center;"> $x = 2a$ $z = 2H/3$ </p>
--	--

c).



$$I_y = \pi H^3 t.$$

τ_{\max} och τ_{\min} sker i samma x eftersom.

$\sigma_z \Rightarrow$ vid $\max(|M|) \Rightarrow x=a$

$$x=a \left\{ \begin{array}{l} \tau_{\max} = \frac{-3Qa/2(-H)}{\pi H^3 t} = \frac{3Qa}{2\pi H^2 t} \\ \tau_{\min} = \frac{-3Qa}{2\pi H^2 t} \end{array} \right.$$

$\tau_{\max} = \frac{3Qa}{2\pi H^2 t}$ <p>$x=a$ $z=a$</p>	$\tau_{\min} = -\frac{3Qa}{2\pi H^2 t}$ <p>$x=a$ $z=-a$</p>
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