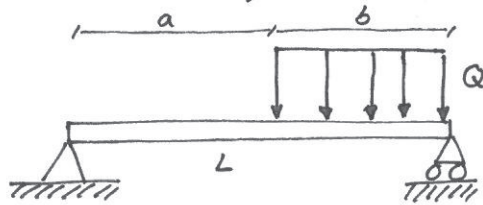


2.4.29

Fritt upplagd balk

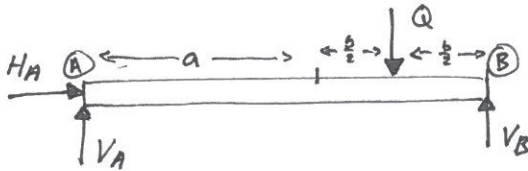
Givet



Sätt T- och M-diagram

Lösning

1. Frilägg



2. Jmv

$$\uparrow: V_A - Q + V_B = 0 \Rightarrow \underline{V_A + V_B = Q}$$

$$\rightarrow: H_A = 0$$

$$\curvearrowright: -(a + \frac{b}{2}) \cdot Q + \underbrace{(a+b)}_{=L} \cdot V_B = 0$$

$$\Rightarrow V_B = \frac{a + \frac{b}{2}}{a+b} \cdot Q = \underline{\underline{\frac{Q \cdot (a + \frac{b}{2})}{L}}}$$

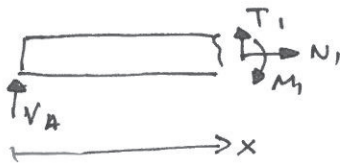
$$V_A = Q - V_B = Q \left(1 - \frac{a + \frac{b}{2}}{L}\right) = Q \left(1 - \frac{a + \frac{b}{2}}{a+b}\right)$$

$$= Q \left(\frac{a+b}{a+b} - \frac{a + \frac{b}{2}}{a+b}\right) = Q \left(\frac{\frac{b}{2}}{a+b}\right) = \underline{\underline{Q \left(\frac{b}{2L}\right)}}$$

3. Snitta

Del 1:

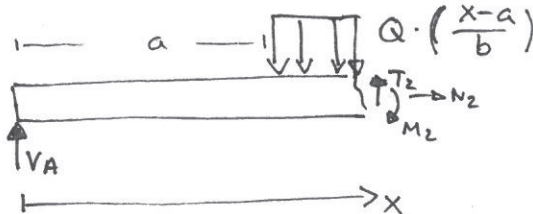
0 ≤ x ≤ a



$$\uparrow: T_1 + V_A = 0 \Rightarrow \underline{\underline{T_1 = -Q \left(\frac{b}{2L}\right)}}$$

$$\Rightarrow \underline{\underline{M_1(x) = -Qx \left(\frac{b}{2L}\right)}}$$

a ≤ x ≤ a+b



$$\curvearrowright: -V_A \cdot x + Q \left(\frac{x-a}{b}\right) \cdot \frac{(x-a)}{2} - M_2 = 0$$

$$\Rightarrow \underline{\underline{M_2(x) = -Q \left(\frac{b}{2L}\right) x + Q \frac{(x-a)^2}{2b}}}$$

$$\uparrow: V_A - Q \left(\frac{x-a}{b}\right) + T_2 = 0$$

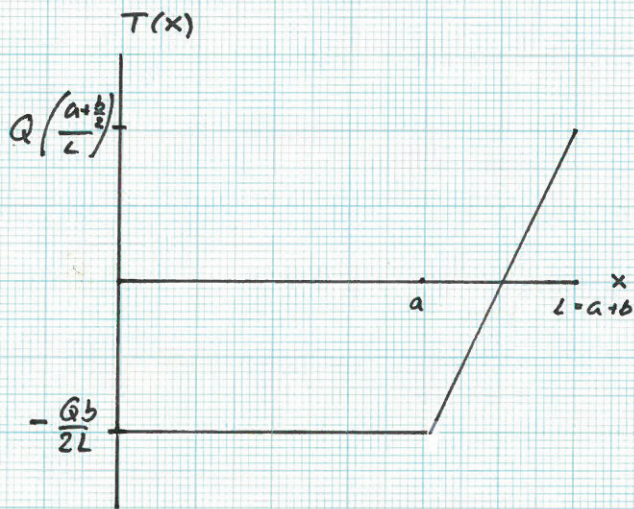
$$\Rightarrow T_2 = Q \left(\frac{x-a}{b}\right) - Q \left(\frac{b}{2L}\right)$$

$$= Q \left(\frac{x-a}{b} - \frac{b}{2L}\right)$$

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forts. 1

T-diagram



$$0 \leq x \leq a: T_1(x) = -Q \cdot \frac{b}{2L}$$

$$M_1(x) = -Qx \cdot \frac{b}{2L}$$

$$a \leq x \leq b+a: T_2(x) = Q \left(\frac{x-a}{b} - \frac{b}{2L} \right)$$

$$M_2(x) = Q \left(\frac{(x-a)^2}{2b} - \frac{b}{2L} \right)$$

M-diagram

