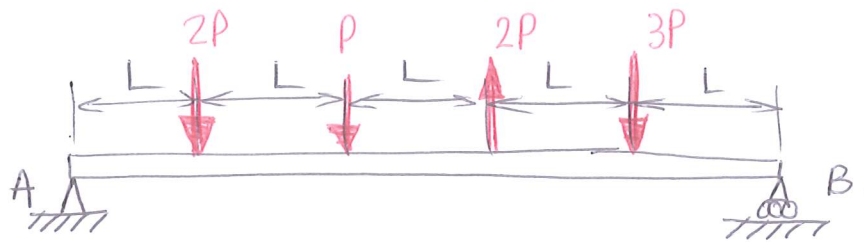


2.4.19

GIVET :

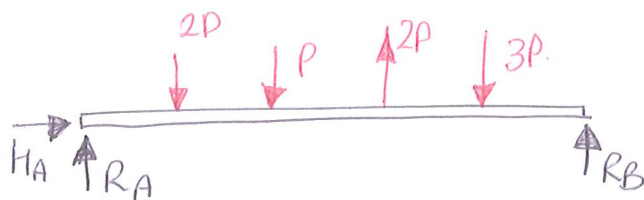
En fritt upplagd  
balk belastas med 4 punktkra-  
fter.



SÖKT: Rita T- och M-diagram.

LÖSNING: { (1) Global  $\sum m_v \Rightarrow$  Reaktionskrafter  
(2) Småta  $\sum m_v \Rightarrow$  Innekrafter/Moment.

1.) Räkna ut reaktionskrafter (m.h.a  $\sum m_v$ ).



$$\rightarrow : \underline{H_A = 0} \quad (1)$$

$$\uparrow : R_A + R_B - (2P + P + 3P) + 2P = 0 \Rightarrow \underline{R_A + R_B - 4P = 0} \quad (2)$$

$$\sum A : 2PL + P(2L) - 2P(3L) - 3P(4L) + R_B(5L) = 0$$

$$R_B = \frac{12PL - 6PL + 2PL + 2PL}{L}$$

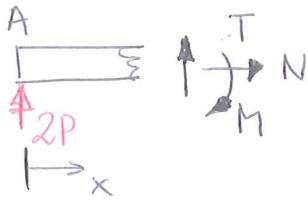
$$\underline{R_B = 2P} \quad (3)$$

$$(3) \text{ i } (2) \Rightarrow \underline{R_A = 2P}$$

STATISKT BESTÄMT.

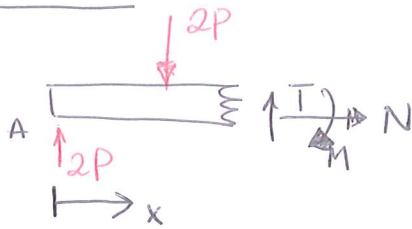
## 2.) Interkræfter / Moment (m.h.a. snitlæs + jmv)

Del 1 :  $0 \leq x \leq L$



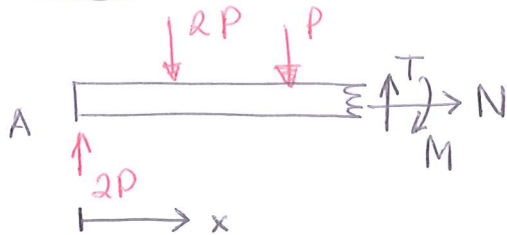
$$\begin{aligned} \rightarrow: N &= 0 \\ \uparrow: 2P + T &= 0 \quad \underline{T = -2P} \\ \sum \mathcal{M}_A: -Tx + M &= 0 \quad \underline{M = -2Px} \end{aligned}$$

Del 2 :  $L \leq x \leq 2L$



$$\begin{aligned} \rightarrow: N &= 0 \\ \uparrow: 2P - 2P + T &= 0 \Rightarrow \underline{T = 0} \\ \sum \mathcal{M}_A: 2PL + M &= 0 \Rightarrow \underline{M = -2PL} \end{aligned}$$

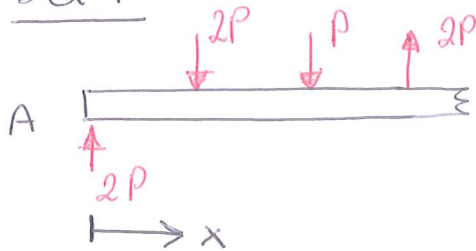
Del 3 :  $2L \leq x \leq 3L$



$$\begin{aligned} \rightarrow: N &= 0 \\ \uparrow: 2P - 2P - P + T &= 0 \Rightarrow \underline{T = P} \\ \sum \mathcal{M}_A: 2PL + P(2L) - Tx + M &= 0 \end{aligned}$$

$$\underline{M = Px - 4PL}$$

Del 4 :  $3L \leq x \leq 4L$

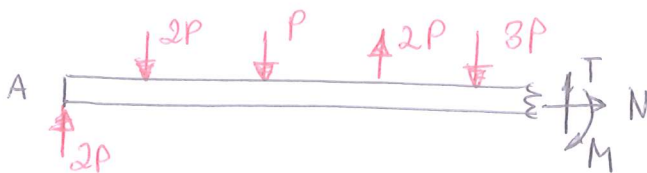


$$\begin{aligned} \rightarrow: N &= 0 \\ \uparrow: 2P - 2P - P + 2P + T &= 0 \\ \underline{T = -P} \end{aligned}$$

$$\sum \mathcal{M}_A: 2PL + 2PL - 6LP - Tx + M = 0$$

$$\underline{M = -Px + 2PL}$$

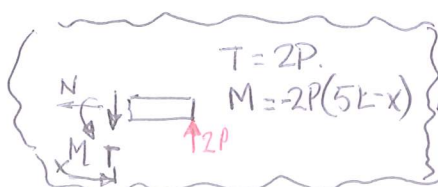
Del 5 :  $4L \leq x \leq 5L$



$$\rightarrow: N = 0$$

$$\begin{aligned} \uparrow: 2P - 2P - P + 2P - 3P + T &= 0 \\ \underline{T = 2P} \end{aligned}$$

$$\sum \mathcal{M}_A = 0:$$

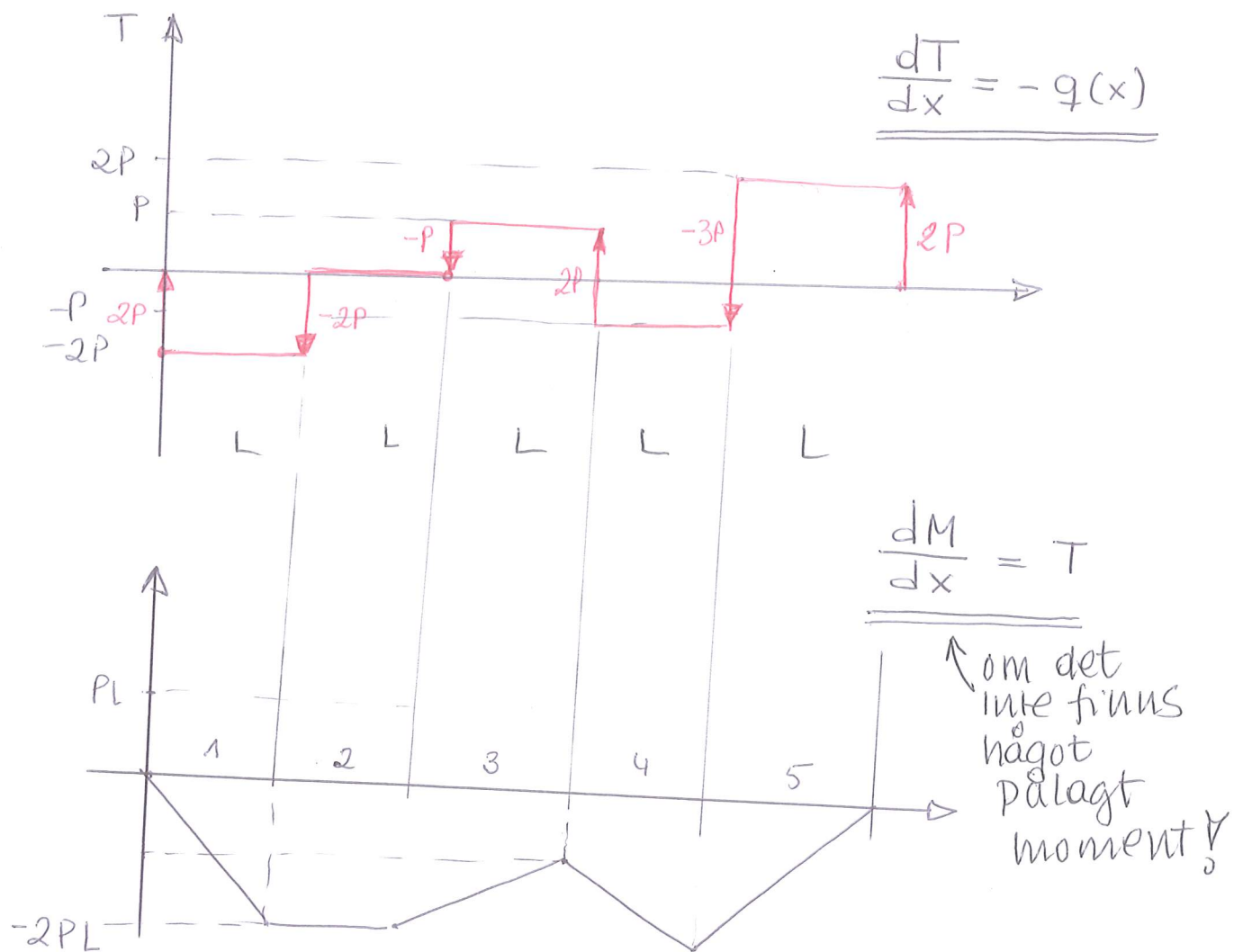


$$T = 2P$$

$$M = -2P(5L - x)$$

$$2P(L) + P(2L) - 2P(3L) + 3P(4L) - Tx + M = 0$$

$$\underline{M = 2Px - 10PL}$$



Enligt def

$$\Delta M_1 = T_1 \cdot \Delta x_1 = (-2P)L$$

$$\Delta M_2 = T_2 \Delta x_2 = 0$$

$$\Delta M_3 = T_3 \Delta x_3 = (P)L$$

$$\Delta M_4 = T_4 \Delta x_3 = (-P)L$$

$$\Delta M_5 = T_5 \Delta x_3 = 2PL$$