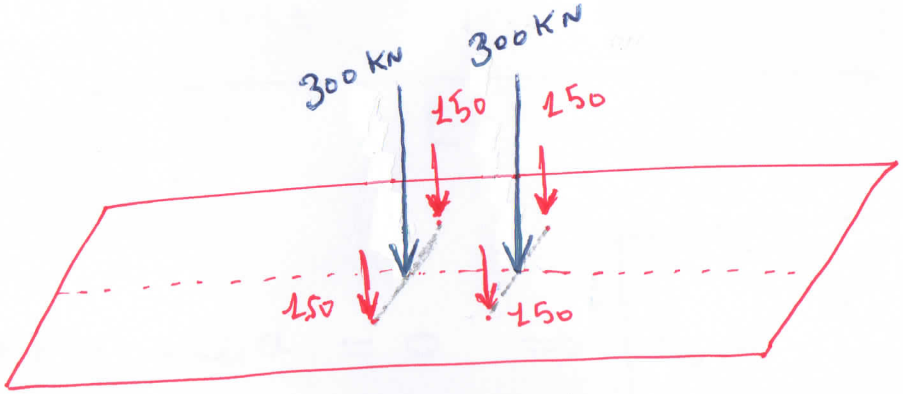
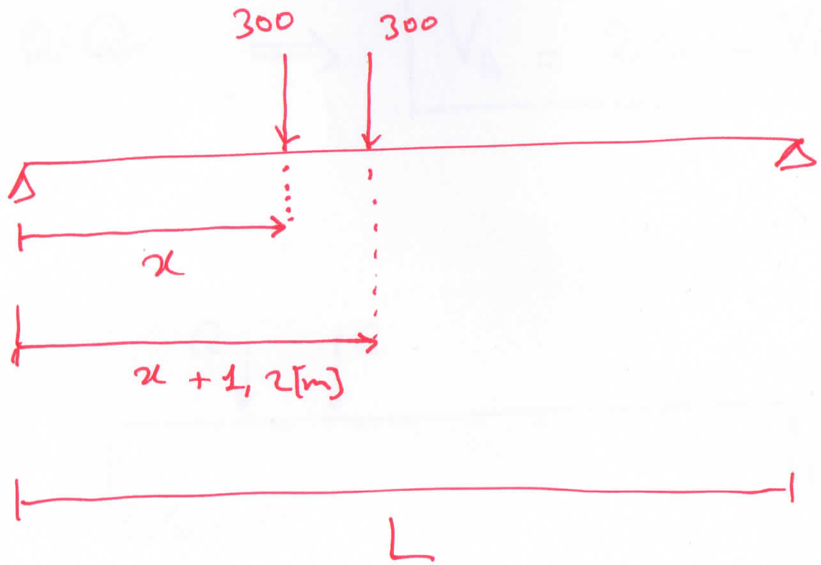
Summer Analyzed

Carico Mobile NTC08

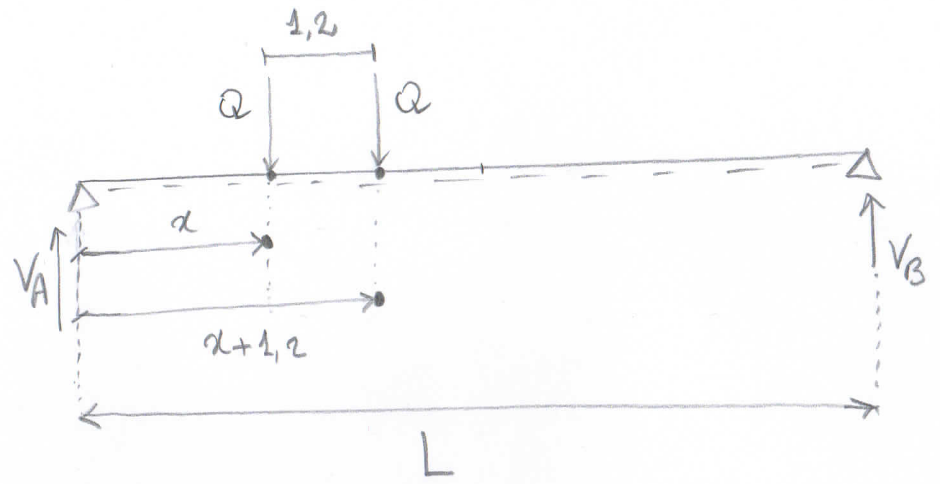


$1,2[m] = \frac{6}{5}[m]$



$\boxed{\frac{6}{5} = 1,2}$

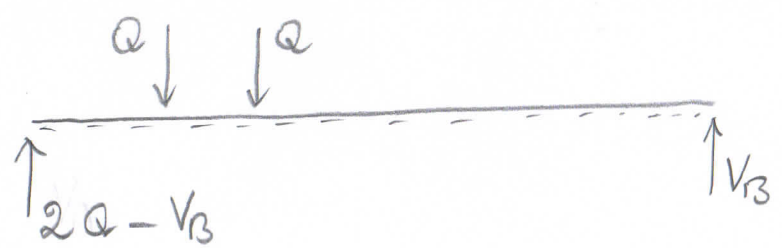
Summer Stuttgart

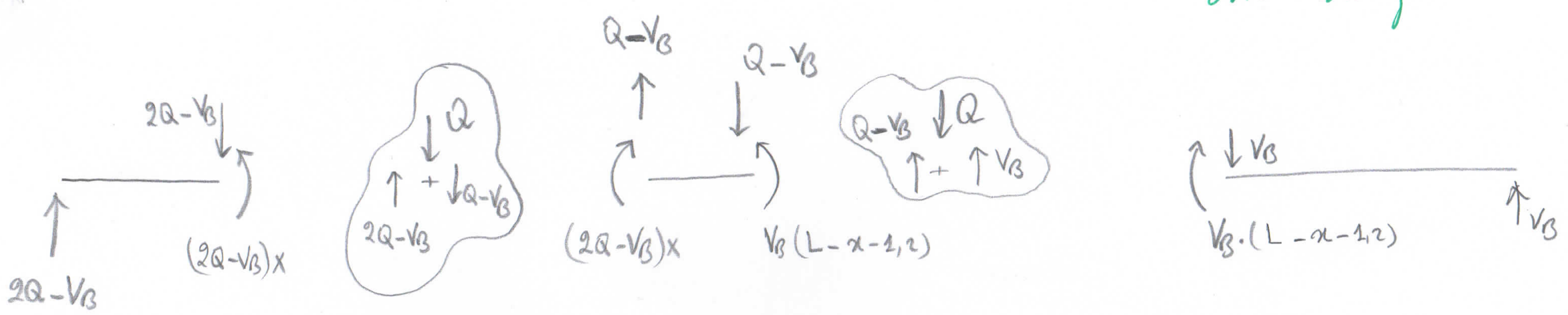


$$\boxed{1{,}2 = \frac{6}{5}}$$

$$+\circlearrowleft \; V_B \cdot L - Q\cdot(x+1{,}2) - Qx = 0 \Rightarrow \boxed{V_B = \frac{Q(x+1{,}2)+Qx}{L}}$$

$$V_A + V_B = 2Q \Longrightarrow \boxed{V_A = 2Q - V_B}$$





ii) $2Qx - V_B x = 2Qx - V_B x$ ok

iii) $V_B(L - x - 1{,}2) = V_B(L - x - 1{,}2)$ ok

i) verifica:

$$V_B(L - x - 1{,}2) - (Q - V_B)(1{,}2) - (2Q - V_B)x = 0$$

$$V_B \cdot L - \cancel{V_B x} - \cancel{V_B 1{,}2} - Q1{,}2 + \cancel{V_B 1{,}2} - 2Qx + \cancel{V_B x} = 0$$

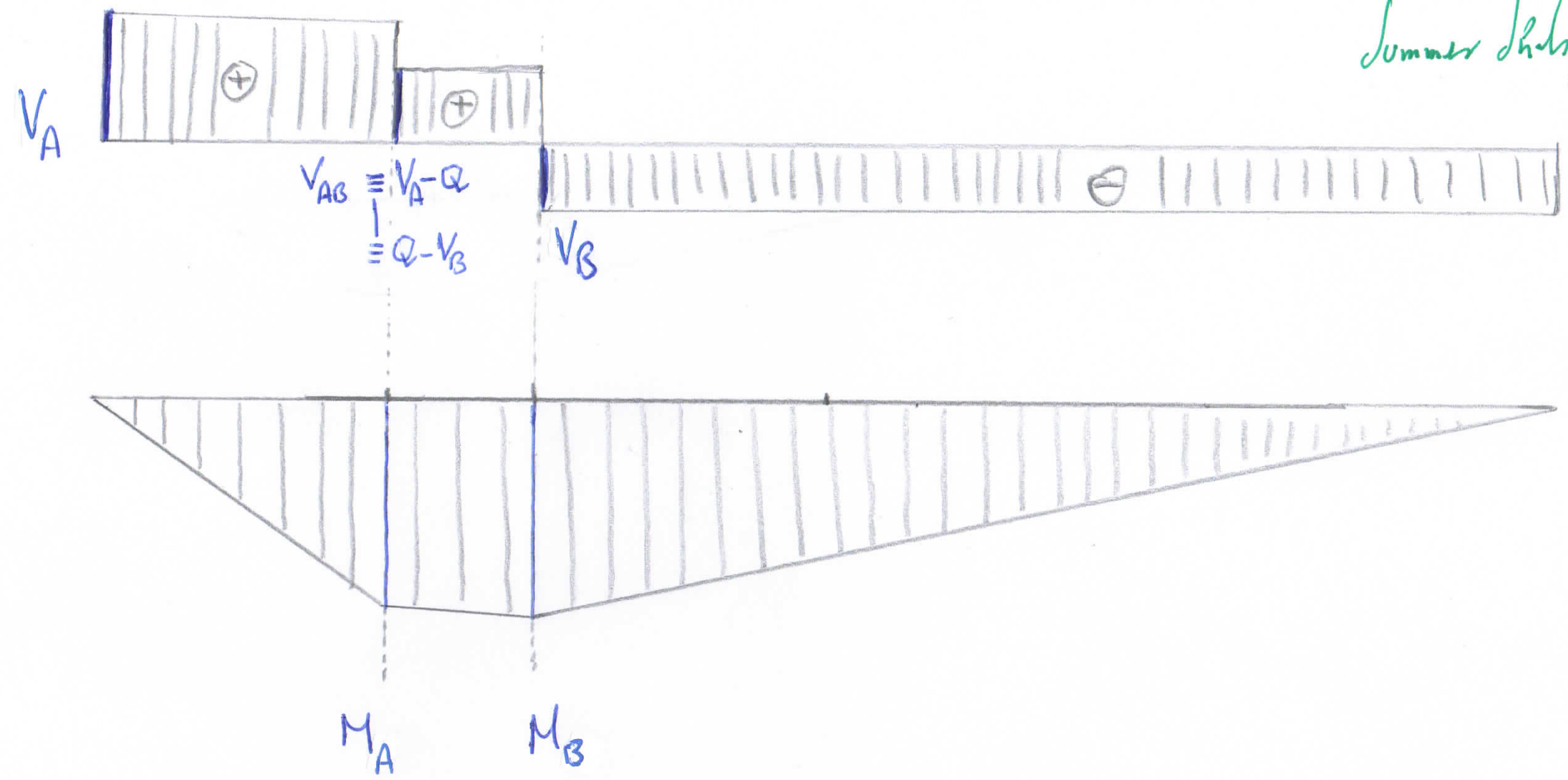
$$V_B \cdot L - Q1{,}2 - 2Qx = 0$$

$$\frac{Q}{\cancel{L}}(2x + 1{,}2) \cdot \cancel{L} - Q(2x + 1{,}2) = 0$$

ok.

③

Summer Shotgun



$$\begin{cases} M_A = V_A \cdot x = (2Q - V_B)x = \left[2Q - \dfrac{Q(2x+1{,}2)}{L}\right]x = \left[\dfrac{2QLx - 2Qx^2 - Q\,1{,}2x}{L}\right] \\ M_B = V_B \cdot (L - (x+1{,}2)) = \left[\dfrac{Q(2x+1{,}2)}{L}\right](L-(x+1{,}2)) = \dfrac{Q}{L}\left[(2x+1{,}2)(L-(x+1{,}2))\right] \end{cases}$$

$$= \frac{Q}{L}\left[(2x+1{,}2)L - (2x+1{,}2)(x+1{,}2)\right] = \frac{Q}{L}\left[(2x+1{,}2)L - 2x^2 - 2x \cdot 1{,}2 + -1{,}2x - 1{,}44\right]$$

Summer Analyst

Condizione di max mom.

$$\boxed{\frac{dM}{dx} = 0} \Rightarrow \begin{cases} 2\cancel{Q}L - 4\cancel{Q}x - \cancel{Q}1{,}2 = 0 \Rightarrow \boxed{x_A = \dfrac{2L - 1{,}2}{4}} \\ 2L - 4x - 2\cdot 1{,}2 - 1{,}2 = 0 \Rightarrow \boxed{x_B = \dfrac{2L - 3{,}6}{4}} \end{cases}$$

OK! ✓

OK! ✓

Guarda pag 5 e 7

$$1{,}2 = \frac{6}{5} \Rightarrow \begin{cases} x_A = \dfrac{5L-3}{10} \\ x_B = \dfrac{5L-9}{10} \end{cases}$$

Infine

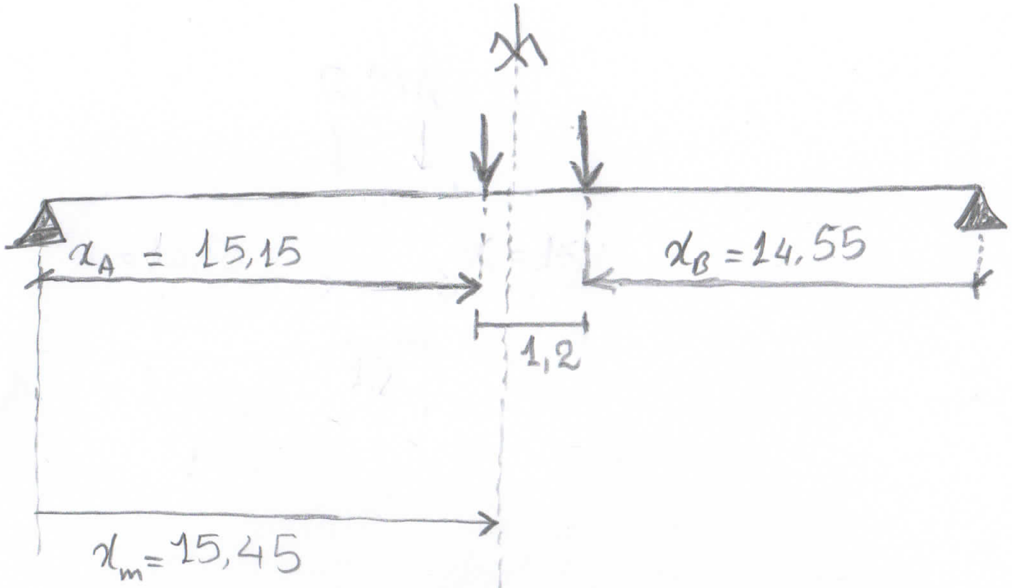
$$\underbrace{M_{max} = M_A(x_A) = M_B(x_B)}_{\downarrow} = \frac{Q(L-0{,}6)^2}{2L}$$

$V_{corrispondente, max}$!

$$\boxed{M_{max} = \frac{Q(L-0{,}6)^2}{2L}} \; ; \; \boxed{V_{cor} = \frac{Q(L-0{,}6)}{L}}$$

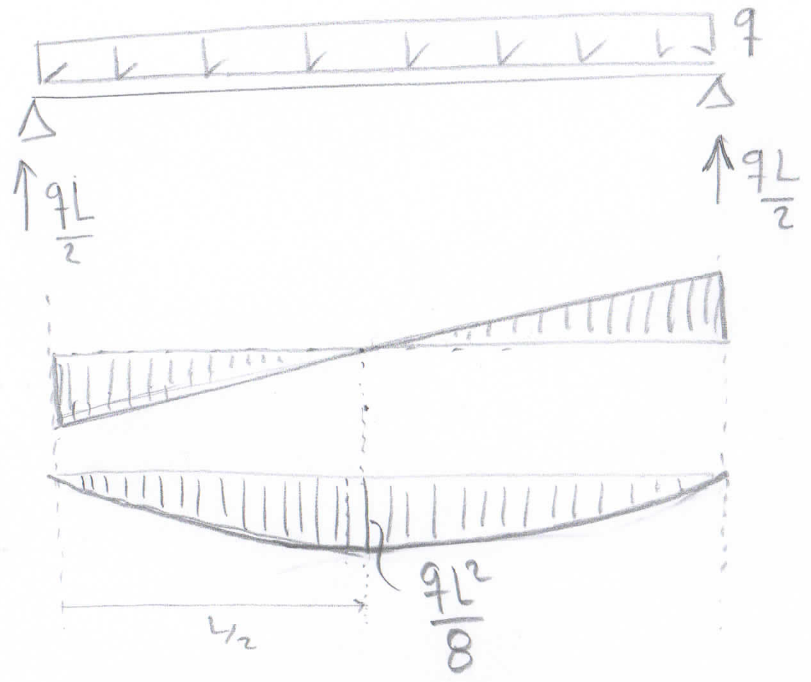
Summer discount

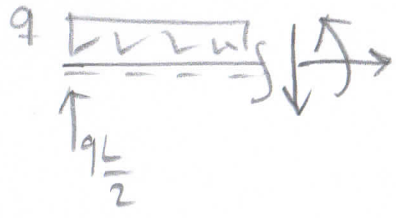
$\mathscr{L} \; L = 30{,}9 \; m$



Verifica: $x_A + x_B + 1{,}2 = 30{,}9$ ok

M e V dovuti ai carichi distribuiti





$$M = \frac{qL}{2}x - \frac{qx^2}{2}$$

$$V = \frac{dM}{dx} = \frac{qL}{2} - qx$$

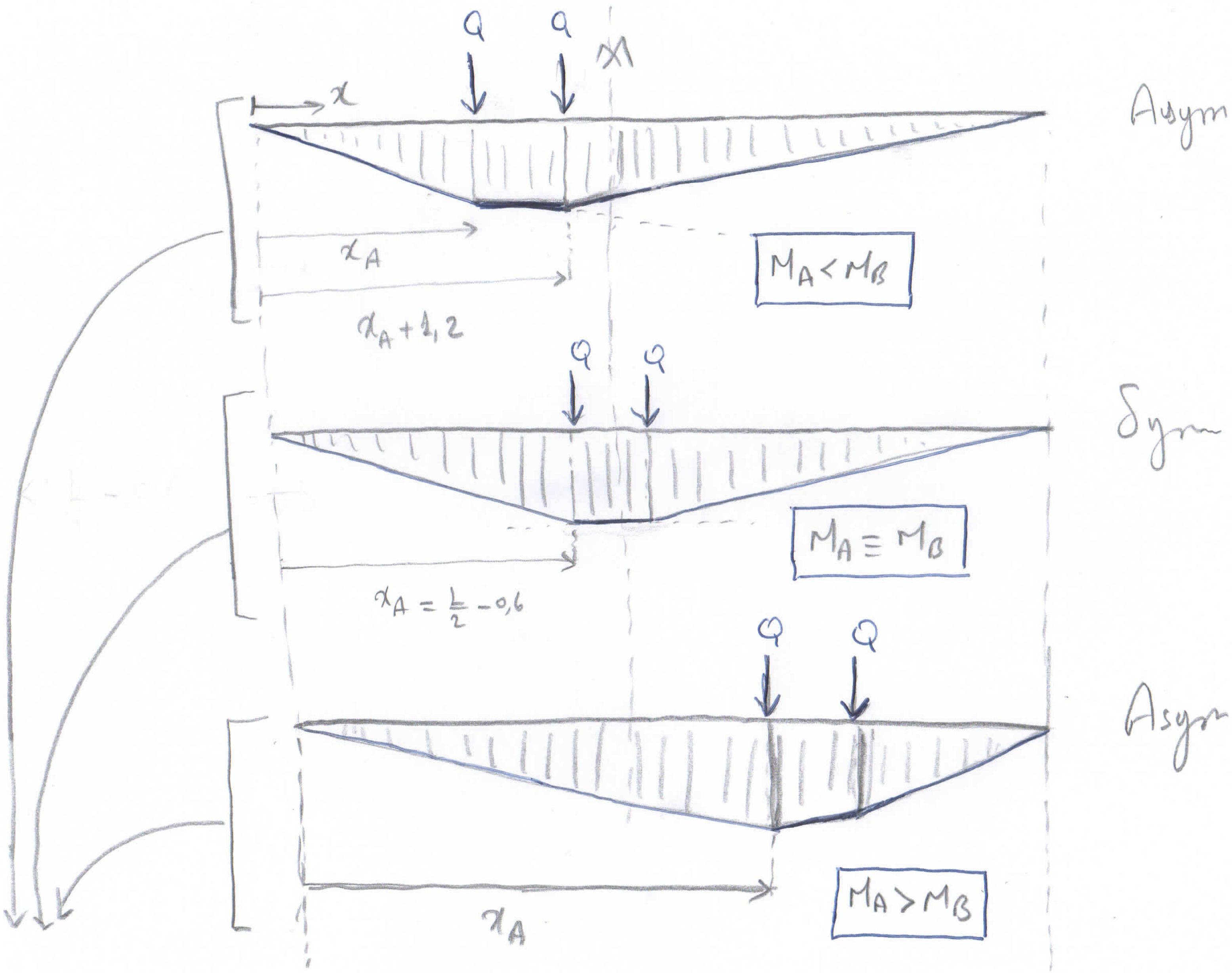
$$\boxed{\begin{aligned} M(x) &= \frac{q}{2}\left[Lx - x^2\right] \\ V(x) &= \frac{q}{2}\left[L - 2x\right] \end{aligned}}$$

NB! Siccome per il carico concentrato Q ho due x_A e x_B ove il M_Q e' max

$\Rightarrow$ Quale di questi x_Q mi da' il M_q max?

Risp: Essendo

Sommer Analysed



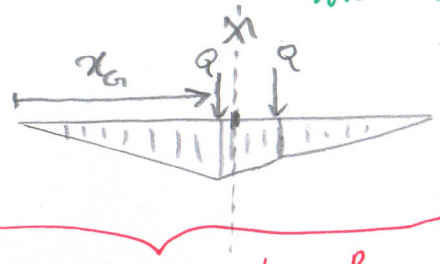
Condizione:

if $\left[x_A \geq \frac{L}{2} - 0,6 \; ; \; M_q(x_A) \; ; \; M_q(x_B) \right]$ o if $\left[x \leq \frac{L}{2} - 0,6 \; ; \; M_q(x_B) \; ; \; M_q(x_A) \right]$; trattazione analitica

%

Ⓜ e Ⓥ corrispondenti dovuti a q

$$x_A = \frac{2L - \overset{6/5}{\overline{1,2}}}{4} = \frac{5L-3}{10}$$

; [con l'hp. ]

dagli esempi sembra che accade sempre questo!

$$\boxed{M^{(q)}_{\text{corrispondente}}(x)} = \frac{q}{2}\left[L\cdot\left(\frac{5L-3}{10}\right) - \left(\frac{5L-3}{10}\right)^2\right] = \frac{q}{2}\left[\frac{\overset{5}{\cancel{10}}L - \cancel{5L} + 3}{10}\right]\left(\frac{5L-3}{10}\right)$$

$$= \frac{q}{200}\left[(5L)^2 - 3^2\right]$$

$$= \boxed{\frac{q}{200}\left[25L^2 - 9\right]}$$

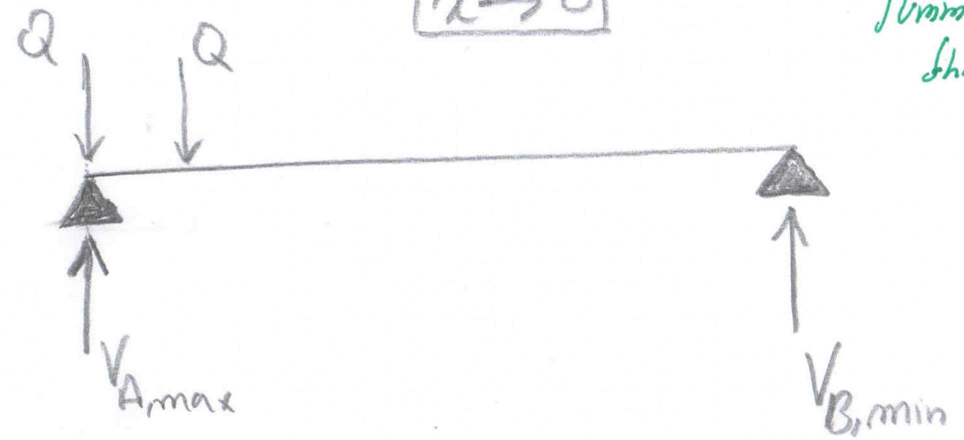
$$\boxed{V^{(q)}_{\text{corrispondente}}(x)} = \frac{q}{2}\left[L - \cancel{2}\left(\frac{5L-3}{\underset{5}{\cancel{10}}}\right)\right] = \frac{q}{2}\left[\frac{\cancel{5L} - \cancel{5L} + 3}{5}\right] = \boxed{\frac{3}{10}q}$$ [KN] perché $\frac{3}{10}$ [m]!

Taglio max all'appoggio (Q):

Condizion di carico per il taglio Max

$\boxed{x \to 0}$

Summer Shah



$$V_{B,min} = \lim_{x \to 0} V_B = \frac{6Q}{5L} \quad [KN]$$

NB! $\frac{6}{5}$ hanno dimension di [m] implicite!

$$V_{A,max} = 2Q - V_{B,min} = 2Q - \frac{6Q}{5L} = \frac{10QL - 6Q}{5L} = \frac{2Q}{5L}\left[5L - 3\right]$$

$$\boxed{V^{(Q)}_{A,max} = \frac{2Q}{5L}\left[5L - 3\right]} \; ; \; \boxed{V^{(Q)}_{B,min} = \frac{6Q}{5L}}$$

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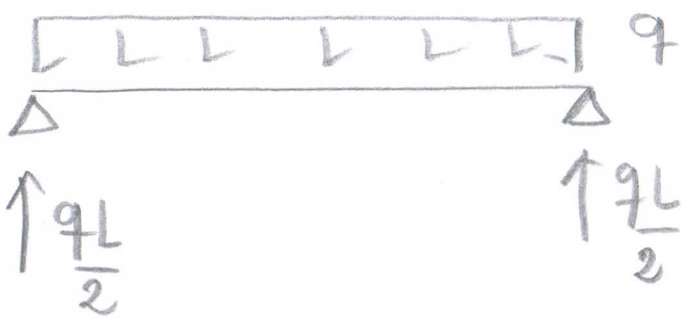
Taglio Max all'appoggio (q):



$$\boxed{V^{(q)}_{A,max} = V^{(q)}_{B,max} = \frac{qL}{2}}$$

$$\boxed{V^{(tot)}_{max} = V^{(Q)}_{A,max} + V^{(q)}_{A,max} = \frac{2Q}{5L}\left[5L-3\right] + \frac{qL}{2}}$$ [KN]

infine:

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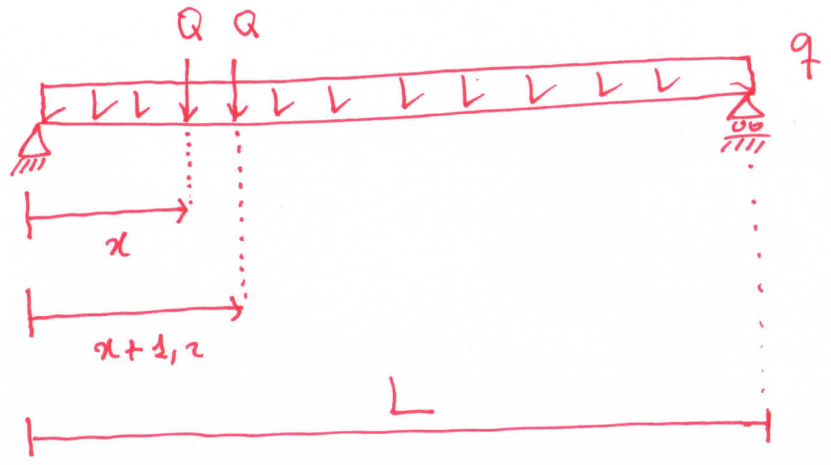


$$\boxed{x^{(max)} = \frac{5L-3}{10}}$$

Campata:

i = 1,2,3, altre colonne

$$\boxed{M^{(i)}_{max}} = \boxed{\frac{Q^{(i)}(5L-3)^2}{50L} + \frac{q^{(i)}(25L^2-9)}{200}}$$

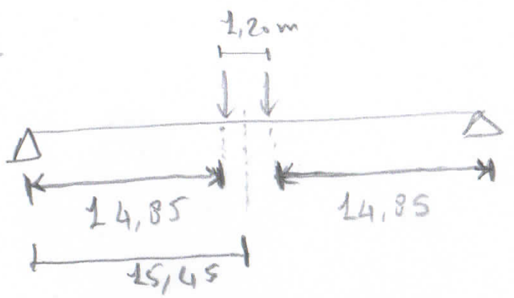
$$\boxed{V^{(i)}_{max}} = \boxed{\frac{Q^{(i)}(5L-3)}{5L} + \frac{3q^{(i)}}{10}\,[kN]}$$

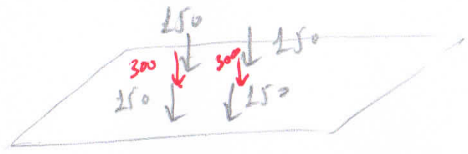
Appoggio:

$$\boxed{M^{(i)}_{max}} = 0$$

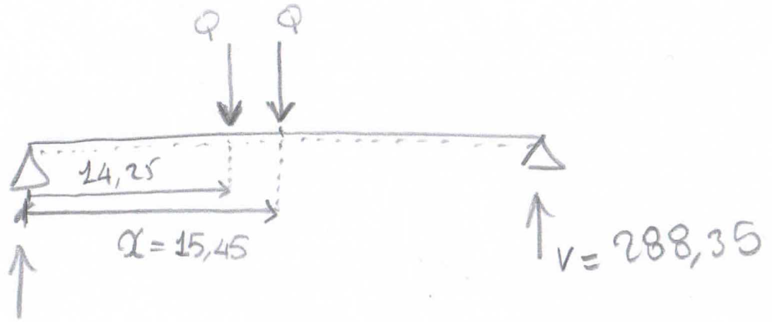
$$\boxed{V^{(i)}_{max}} = \boxed{\frac{2Q^{(i)}(5L-3)}{5L} + \frac{q^{(i)}L}{2}}$$

Altro

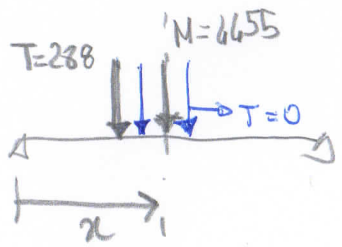




$$M^{(Q)}_{mezzerie} = Q \cdot b = \overset{KN}{300} \times 14,85\,m = 4455\ KN \cdot m$$



$$V \cdot 30,90 = Q \cdot 15,45 + Q\,14,25 = \frac{Q\,15,45 + Q\,14,25}{30,90}$$



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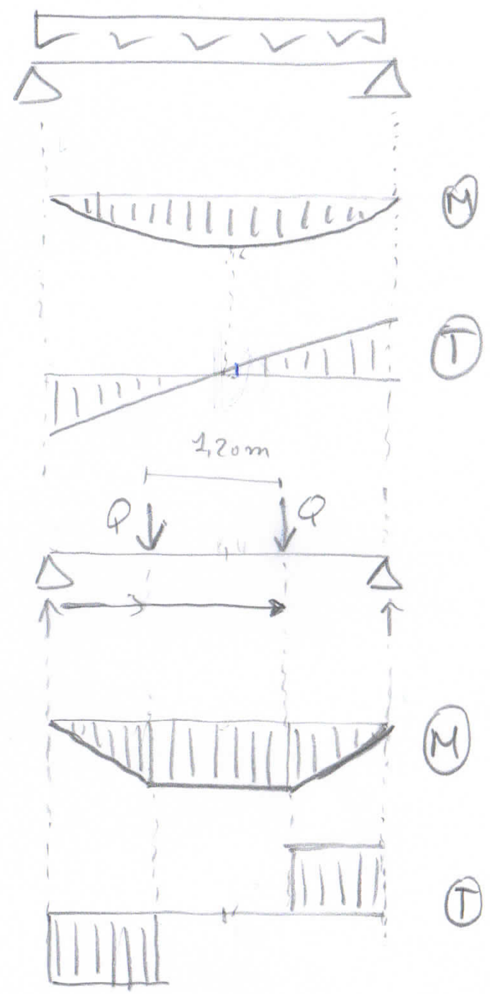
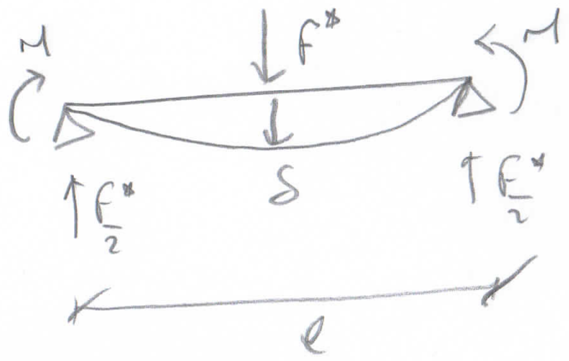


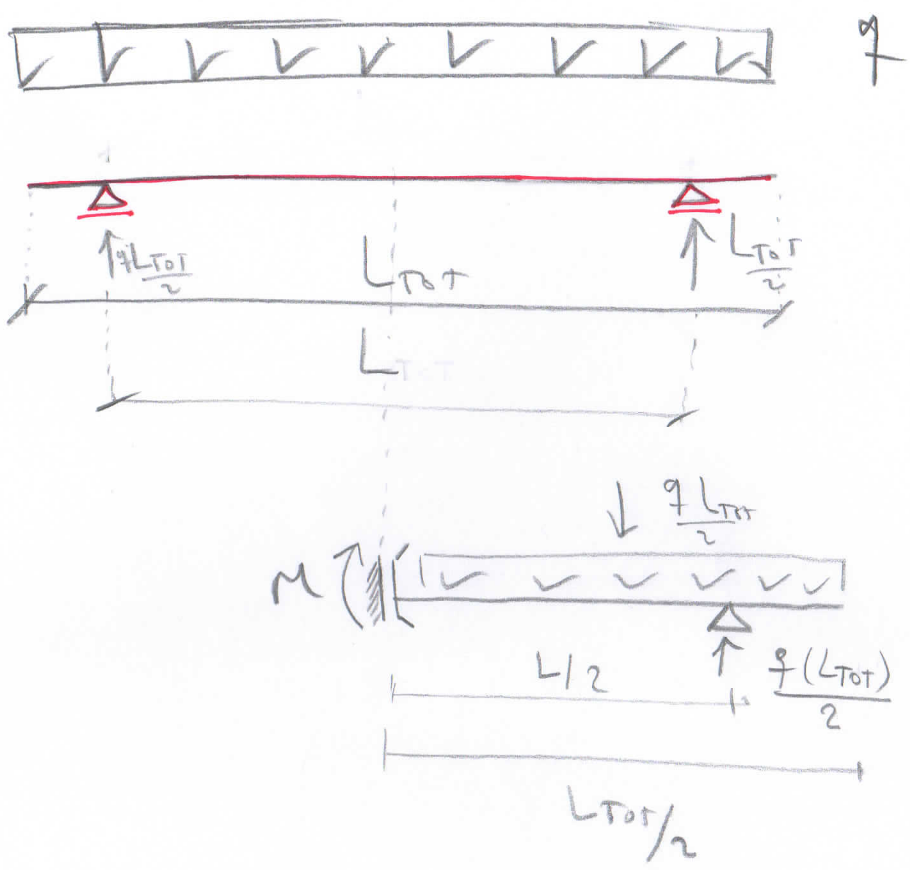
calcolo freccia:



$$M = \frac{F^*}{2} \cdot z + M$$

$$\xi = \cancel{2} \left[\frac{1}{\cancel{2} E I} \cdot \int_0^{\frac{l}{2}} \left(\frac{F^*}{2} \cdot z + M \right)^2 \right]$$

$$\frac{d\xi}{dF} = \delta^* \xrightarrow[\lim F^* \to 0]{} \boxed{\delta = \frac{M \cdot l^2}{8 \cdot E I}}$$



$$M = \frac{qL_{TOT}}{2}\cdot\frac{L}{2} - \frac{qL_{TOT}}{2}\cdot\frac{L_{TOT}}{4}$$

$$\boxed{M = \frac{qL_{TOT}L}{4} - \frac{qL_{TOT}^2}{8}}$$

OK!