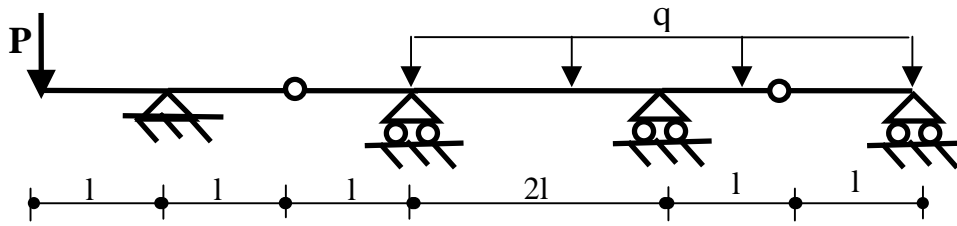
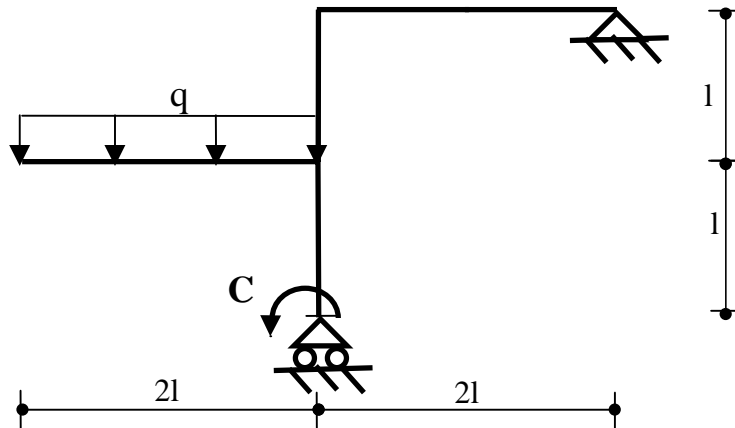


FERRARA, 27/10/2009

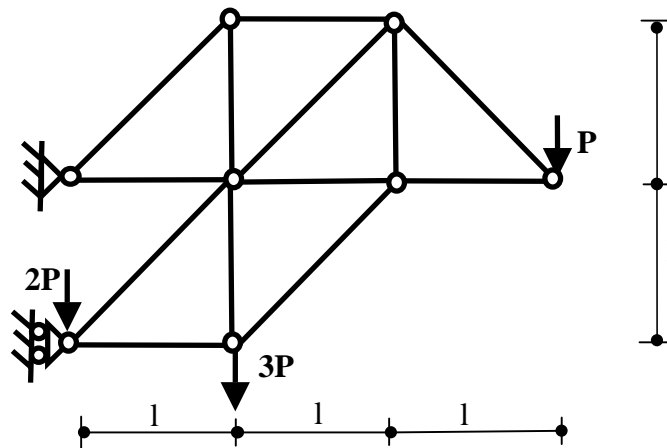
- 1) Disegnare i diagrammi quotati delle azioni interne (N, T, M) per $l=1$ m, $q=10$ kN/m, $P=20$ kN.



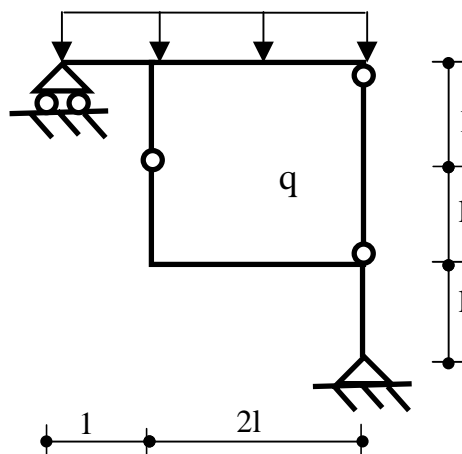
- 2) Disegnare i diagrammi quotati delle azioni interne (N, T, M) per $l=1$ m, $q=10$ kN/m, $C=15$ kN m.



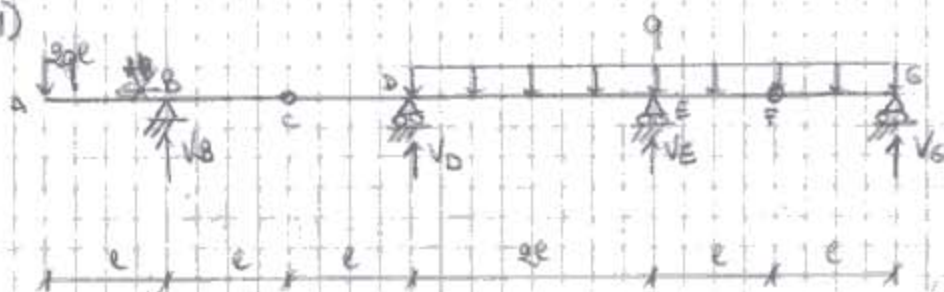
- 3) Calcolare lo stato di sollecitazione per $l=1$ m, $P=20$ kN.



- 4) Disegnare i diagrammi quotati di (N,T,M) per $l=1$ m, $q=10$ kN/m.



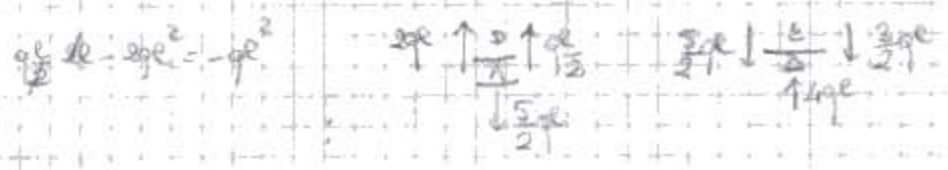
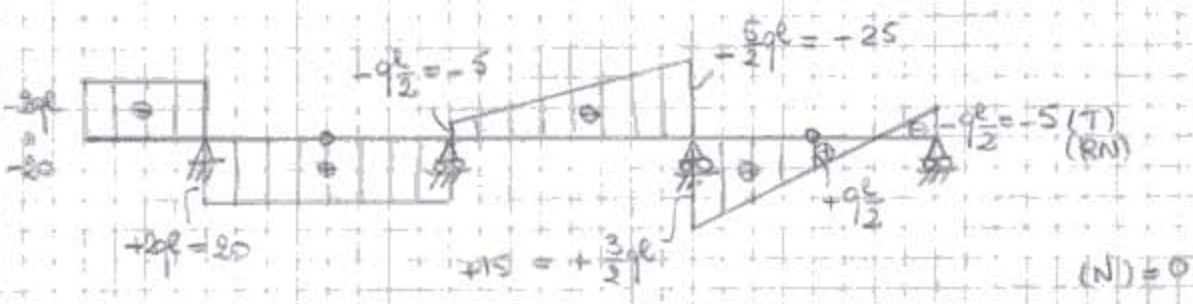
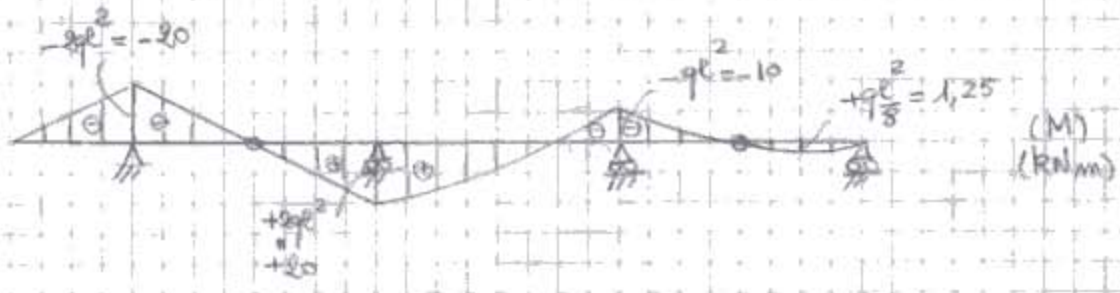
C1)



(→) $H_B = 0$
 (C) CBA $V_B/l = 2ql = 4ql$
 (F) FG $V_G/l = ql \cdot \frac{l}{2} = 5ql$

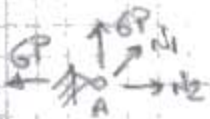
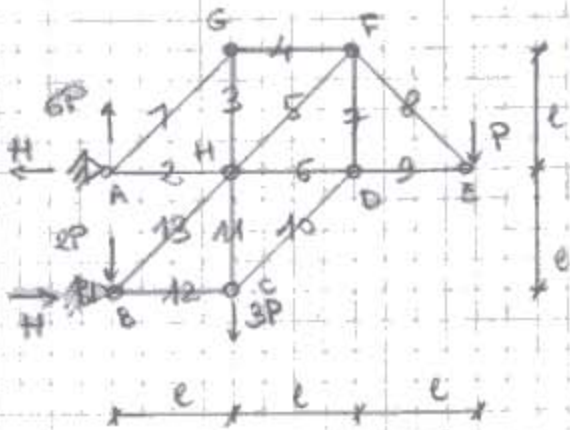
(E) $V_D \cdot 2l = ql \cdot \frac{l}{2} \cdot 2l - 4ql \cdot l + 2ql \cdot l = ql^2(10 - 16 + 1) = -5ql^2 \rightarrow V_D = -\frac{5}{2}ql = -25ql$

(↑) $V_E = 4ql + 2ql + \frac{5}{2}ql - ql \cdot \frac{l}{2} - 4ql = 4ql = 40ql$

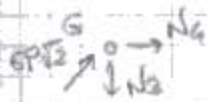


(3)

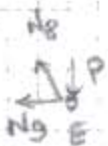
$$(A) \quad H_L = 3Pe + 3Pe \rightarrow H = 6P$$



$$\begin{cases} N_1 \frac{\sqrt{2}}{2} = -6P \rightarrow N_1 = -6P\sqrt{2} \\ N_2 = 6P - N_1 \frac{\sqrt{2}}{2} = 6P + 6P = 12P \end{cases}$$



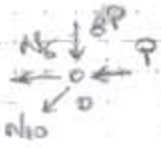
$$\begin{cases} N_4 = -6P\sqrt{2} \frac{\sqrt{2}}{e} \\ N_3 = 6P\sqrt{2} \frac{\sqrt{2}}{e} \end{cases}$$



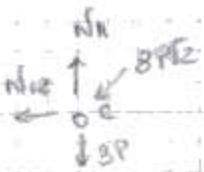
$$\begin{cases} N_8 \frac{\sqrt{2}}{2} = P \rightarrow N_8 = P\sqrt{2} \\ N_9 = -N_8 \frac{\sqrt{2}}{2} = -P \end{cases}$$



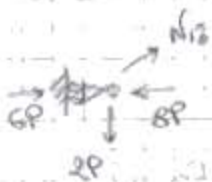
$$\begin{cases} N_5 \frac{\sqrt{2}}{2} = 6P + P\sqrt{2} \frac{\sqrt{2}}{e} = 7P \rightarrow N_5 = 7P\sqrt{2} \\ N_7 = -P\sqrt{2} \frac{\sqrt{2}}{e} - N_5 \frac{\sqrt{2}}{2} = -P - 7P = -8P \end{cases}$$



$$\begin{cases} N_{10} \frac{\sqrt{2}}{2} = -8P \rightarrow N_{10} = -8P\sqrt{2} \\ N_6 = -P - N_{10} \frac{\sqrt{2}}{2} = -P + 8P = 7P \end{cases}$$

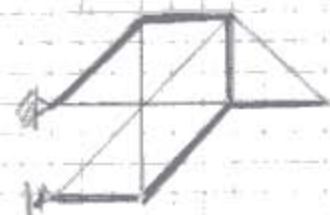


$$\begin{cases} N_{12} = -8P\sqrt{2} \frac{\sqrt{2}}{e} \\ N_{11} = 3P + 8P\sqrt{2} \frac{\sqrt{2}}{e} \end{cases}$$



$$\begin{cases} N_{13} \frac{\sqrt{2}}{2} = 2P \rightarrow N_{13} = 2P\sqrt{2} \\ 6P = 6P - N_{13} \frac{\sqrt{2}}{2} = 6P - 2P \end{cases}$$

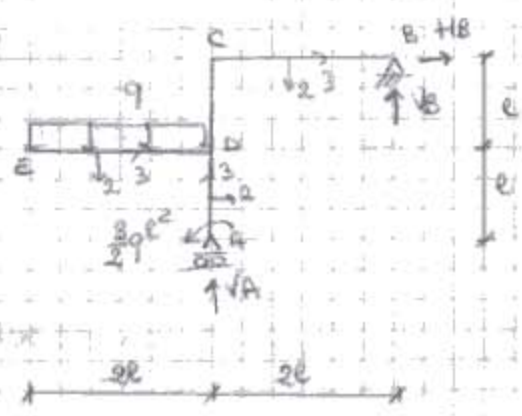
| ASTA | N | RN |
|------|---------------|------|
| 1 | $-6P\sqrt{2}$ | -170 |
| 2 | $12P$ | 240 |
| 3 | $6P$ | 120 |
| 4 | $-6P$ | -120 |
| 5 | $7\sqrt{2}P$ | 198 |
| 6 | $7P$ | 140 |
| 7 | $-8P$ | -160 |
| 8 | $P\sqrt{2}$ | 28 |
| 9 | $-P$ | -28 |
| 10 | $-8P\sqrt{2}$ | -226 |
| 11 | $11P$ | 220 |
| 12 | $-8P$ | -160 |
| 13 | $2P\sqrt{2}$ | 57 |



TIRANTE

PUNTOE

(2)

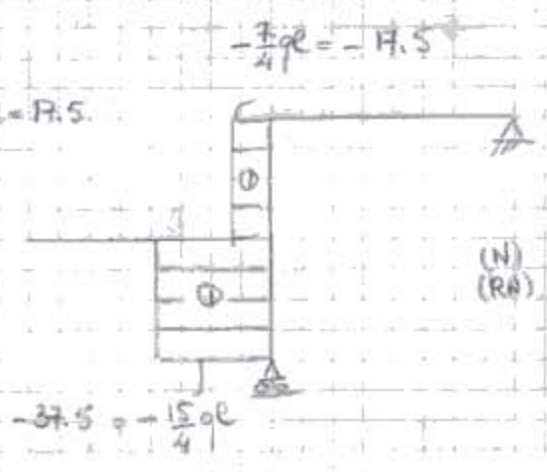
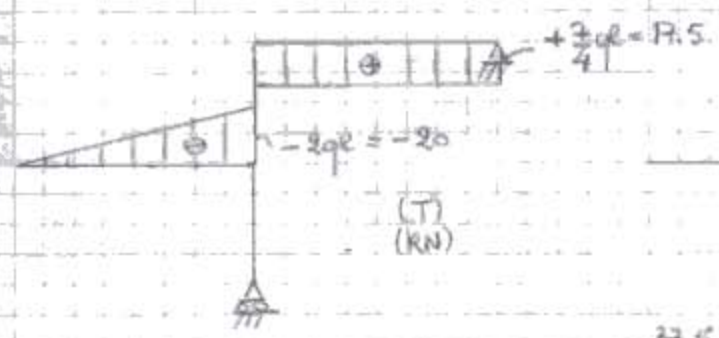
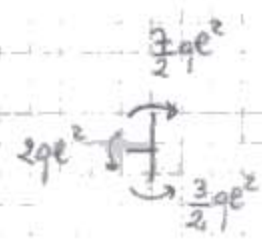
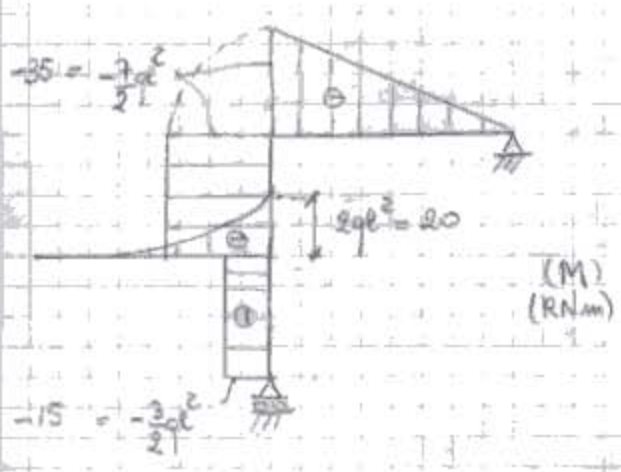
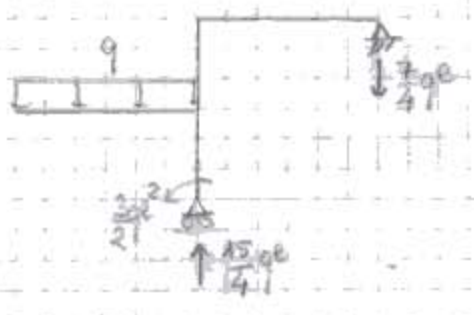


$\rightarrow \sum HB = 0$

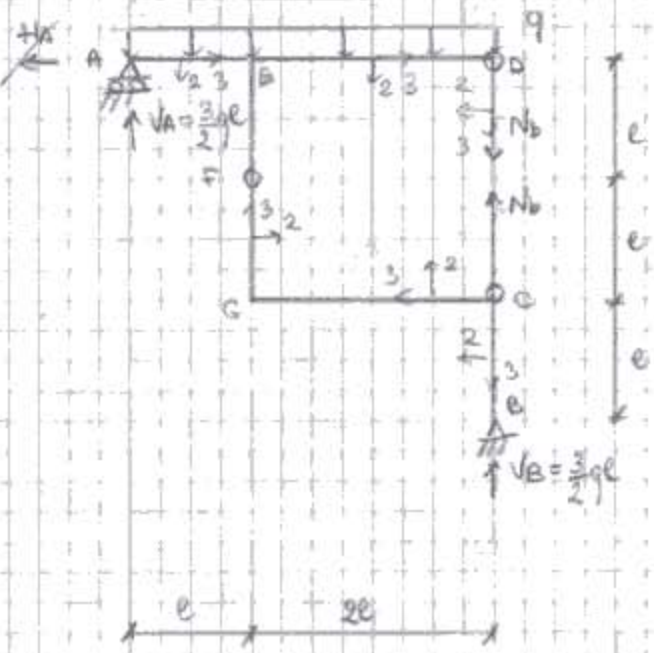
(A) $\sum M_D = 0 \Rightarrow 2ql \cdot 2l + \frac{3}{2}ql^2 + 2ql \cdot 2l = 0$

$\Rightarrow V_B = -\frac{7}{4}ql = -17.5 \text{ kN}$

(1) $V_A = 2ql + \frac{7}{4}ql = \frac{15}{4}ql = 37.5 \text{ kN}$



C4)

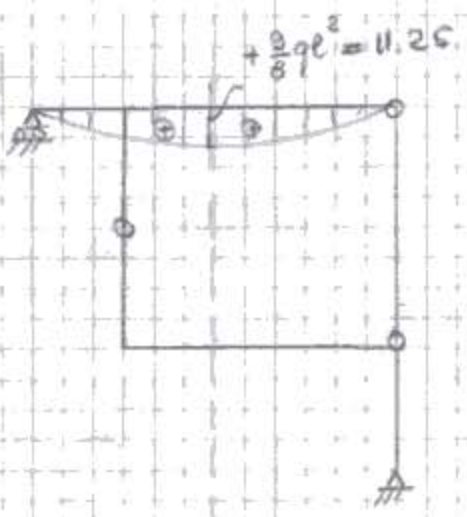


(→) $H_A = 0$

(A) $N_B = 3/2 ql$

(↑) $V_A = 3/2 ql - 3/2 ql = 0$

(F) $N_C = -3/2 ql$



$\frac{3}{2} ql \cdot \frac{3}{2} l - \frac{3}{2} ql \cdot \frac{3}{4} l = \frac{15}{8} ql^2$

