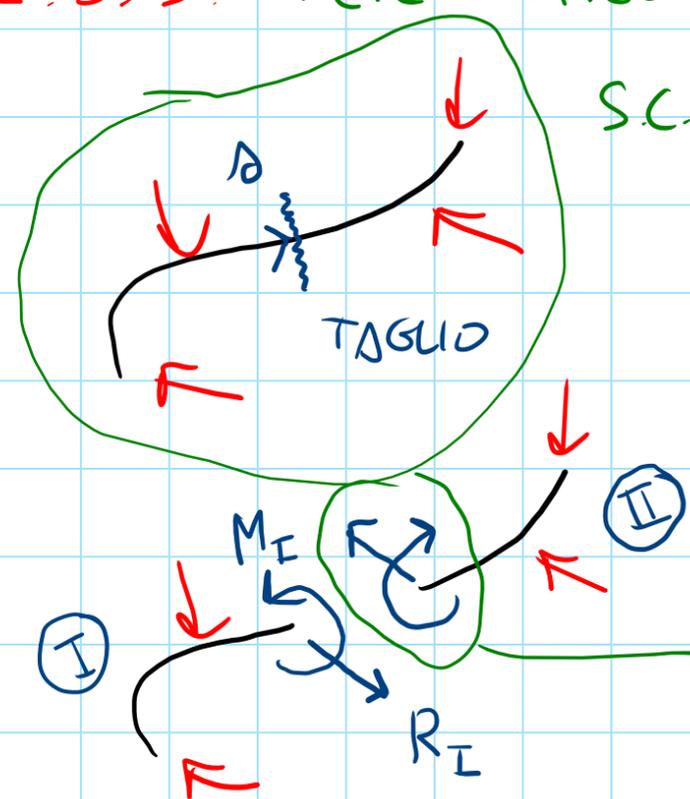


31/10/25

IN GENERALE, NELLO SPAZIO, LA CONOSCENZA DELLE 6 COMPONENTI (C.D.S.) EQUIVALE A CONOSCERE I VETTORI  $\underline{R}_I, \underline{M}_I$ .

IL PROBLEMA CHE È NECESSARIO RISOLVERE È IL CALCOLO DELLE 6 FUNZIONI  $N(s), Q_x(s), \dots, M_z(s)$ .

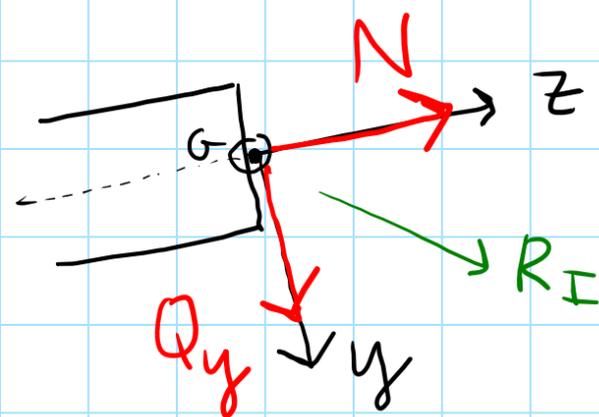
C.D.S. PER STRUTTURE PIANE



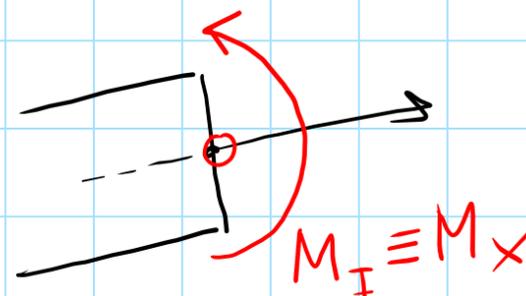
S.C.L. - EQUIL.

VECTORI OPPOSTI A  $R_I, M_I$

X ESCE DAL FOGLIO

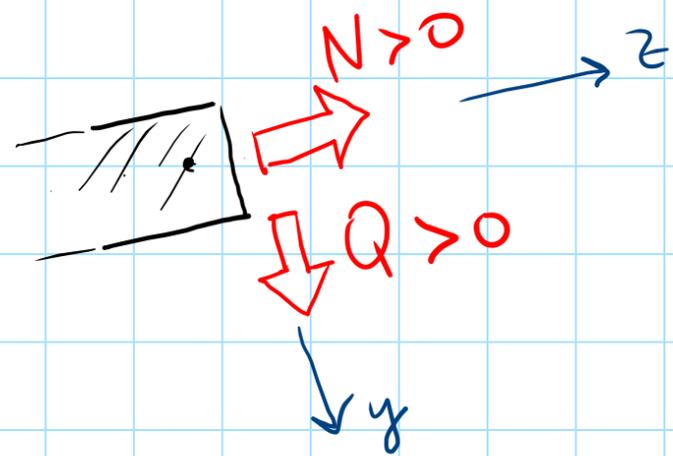


3 C.D.S.  $\left\{ \begin{array}{l} N \\ Q_y \\ M_x \end{array} \right\} \xrightarrow{R_I} Q, T, V$   
 $M_x \Rightarrow M$



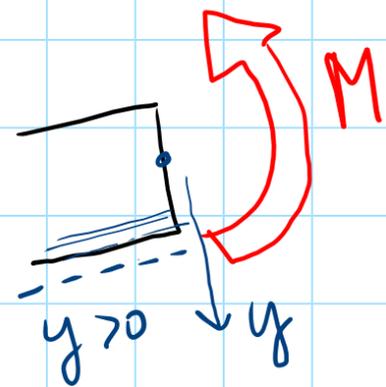
NEL PIANO, LE C.D.S. SONO NOTE SE SI CONOSCONO LE 3 FUNZ.  
 $N(x)$ ,  $Q(x)$ ,  $M(x)$ .

CONVENZIONI SUI SEGNI DELLE C.D.S.



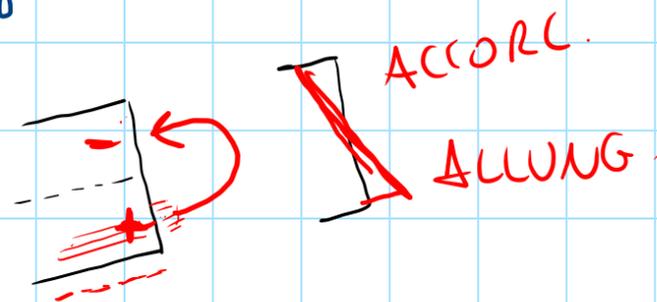
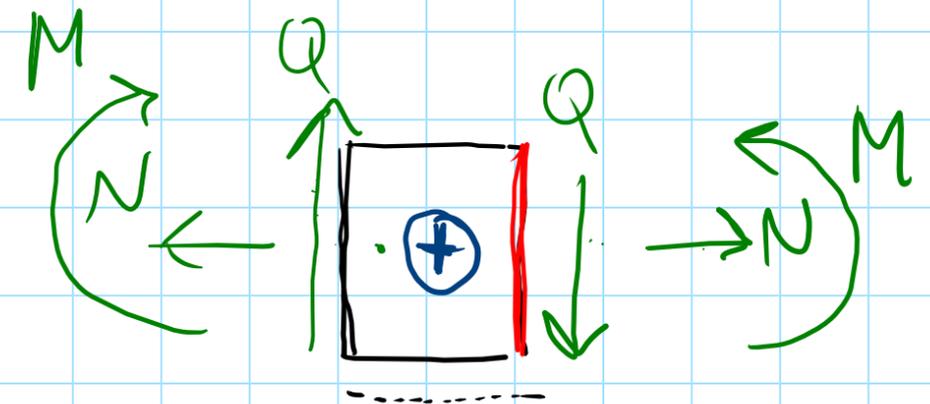
$N > 0$ : METTE IN "TRAZIONE" LA SEZIONE

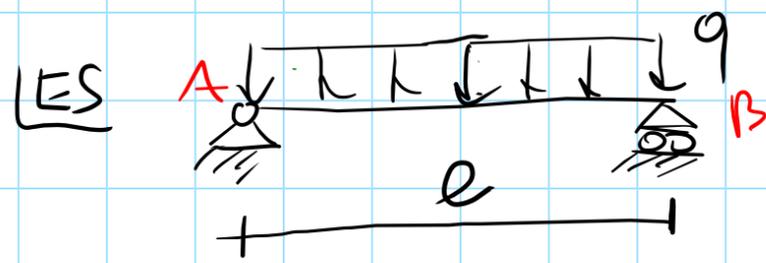
$Q > 0$ : METTE IN ROTAZ. LA SEZIONE IN SENSO ORARIO  
RISPETTO AD UN PUNTO INTERNO DELL'INTERNO  
DEL BARICENTRO



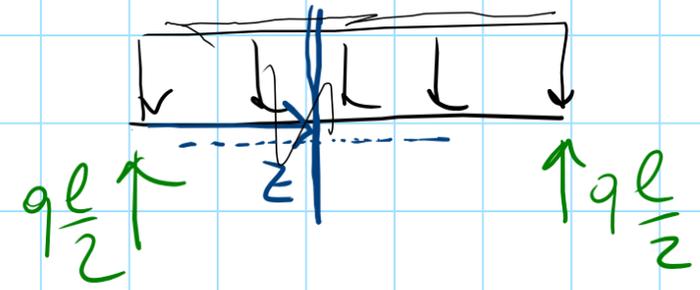
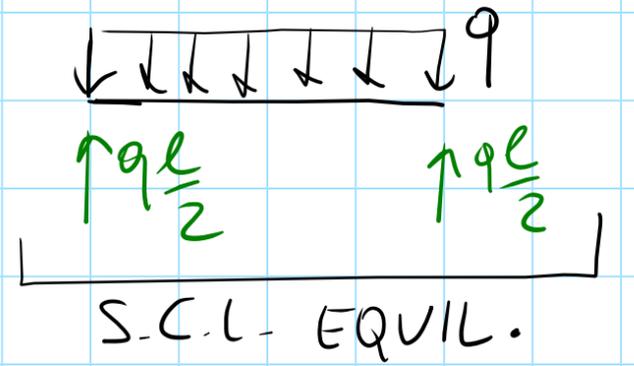
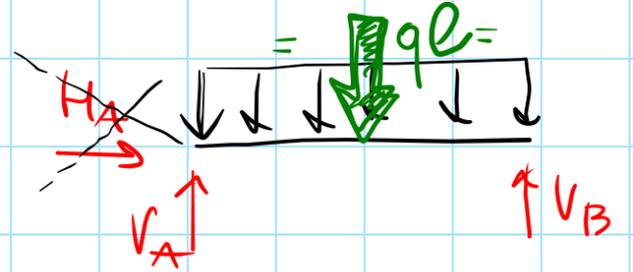
$M > 0$ : TENDÈ AD "ALLUNGARE" LE FIBRE CHE ABBIAMO  
PRIORITARIAMENTE DEFINITO CON IL TRATTEGGIO  
(OPPURE  $y > 0$ )

CONCIO ELEMENTARE

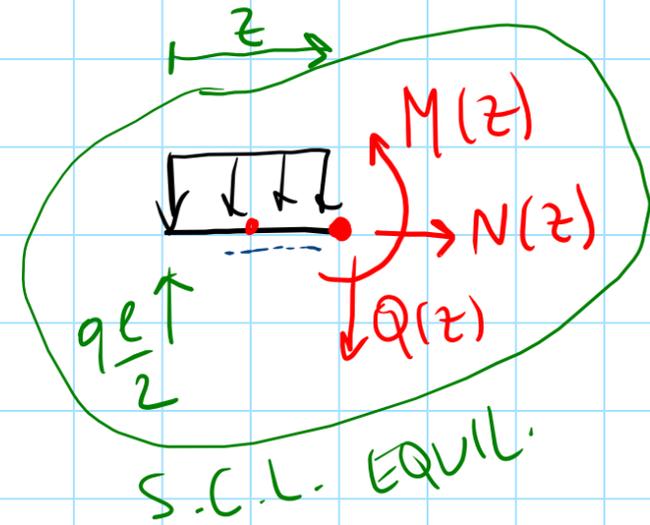
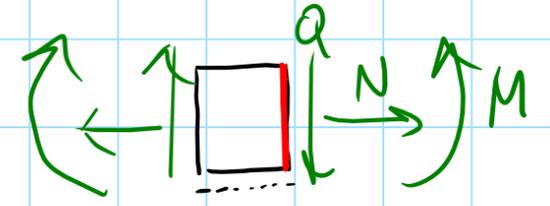




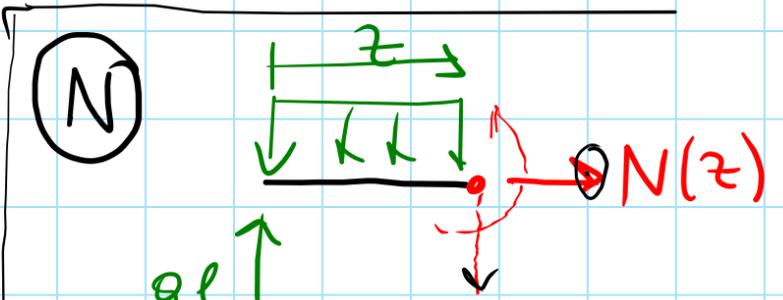
TRAVE "APPOGGIATA"  
CON FORZA DISTRIB.



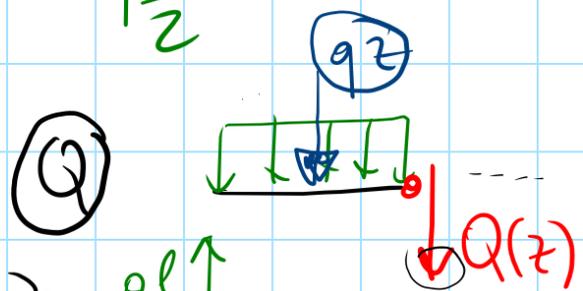
$N(z)$   
 $Q(z)$   
 $M(z)$  → CALCOLO CON UN SOLO "TAGLIO" DI SEZIONE VARIABILE CON  $z \in [0, l]$



3 INCOGNITE STATICHE  
⇒ E.C.S.!



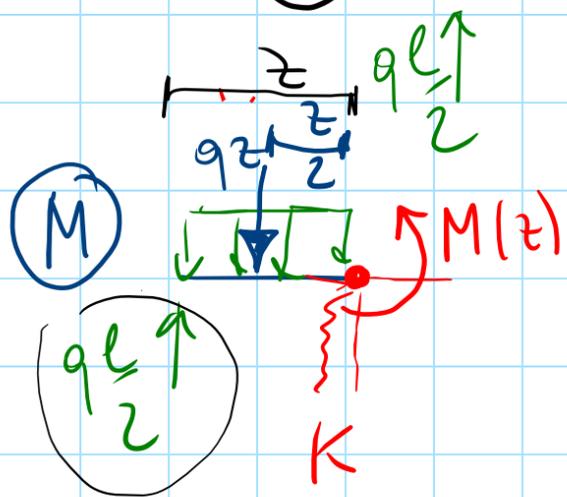
$\rightarrow \oplus : +N(z) = 0$



$\uparrow \downarrow : -ql/2 + qz + Q(z) = 0$

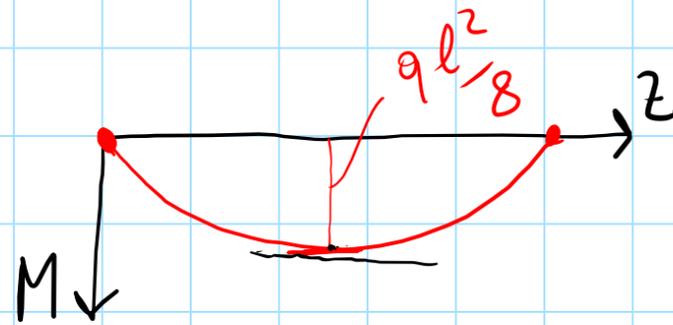
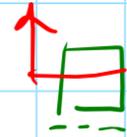
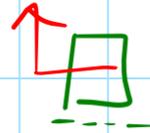
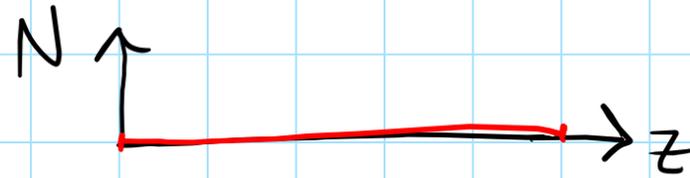
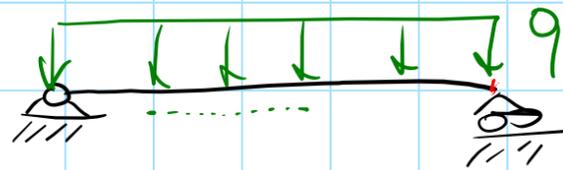
$Q(z) = ql/2 - qz$

SI SUGGERISCE DI SCRIVERE UNA EQUAZIONE ALA VOLTA PER TROVARE UNA C.D.S. SOLA



$\rightarrow \oplus : -ql/2 z + qz \cdot \frac{z}{2} + M(z) = 0$

$M(z) = ql/2 z - q \frac{z^2}{2}$

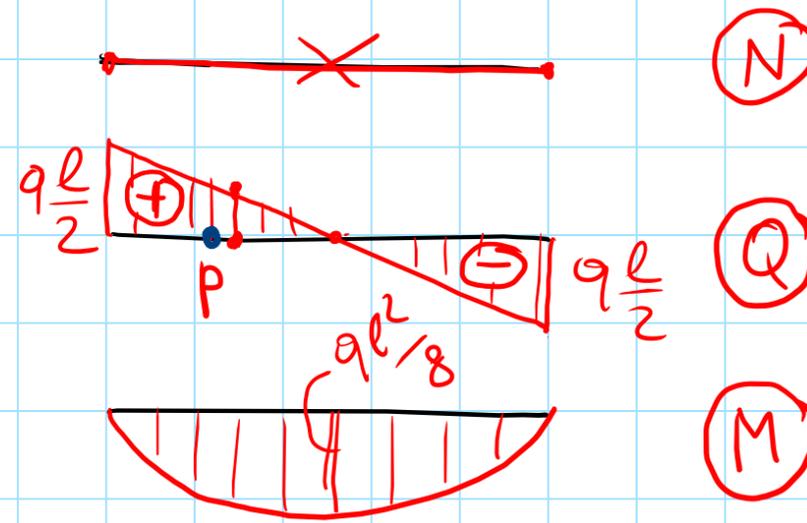


$$Q(z) = \frac{ql}{2} - qz$$

$$M(z) = \frac{ql}{2}z - \frac{qz^2}{2} \quad ; \quad M\left(\frac{l}{2}\right) = \frac{ql}{2} \cdot \frac{l}{2} - \frac{q}{2} \cdot \frac{l^2}{4} = +\frac{ql^2}{8}$$

## DIAGRAMMI DELLE CDS

(GRAFICI DELLE FUNZ.  $N(z), Q(z), M(z)$   
SECONDO CONVENZIONI CHE VALGONO IN  
CAMPO INGEGNERISTICO)



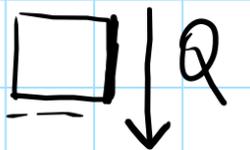
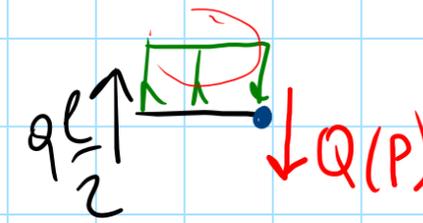
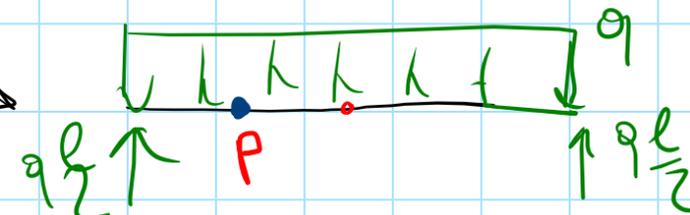
$N$

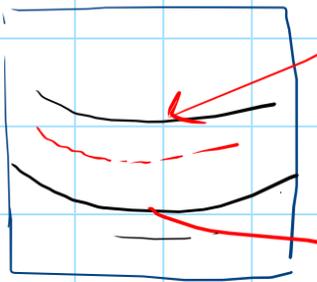
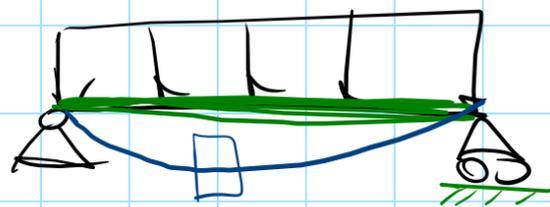
$Q$

$M$

SEGNO È  
OBBLIGATORIO

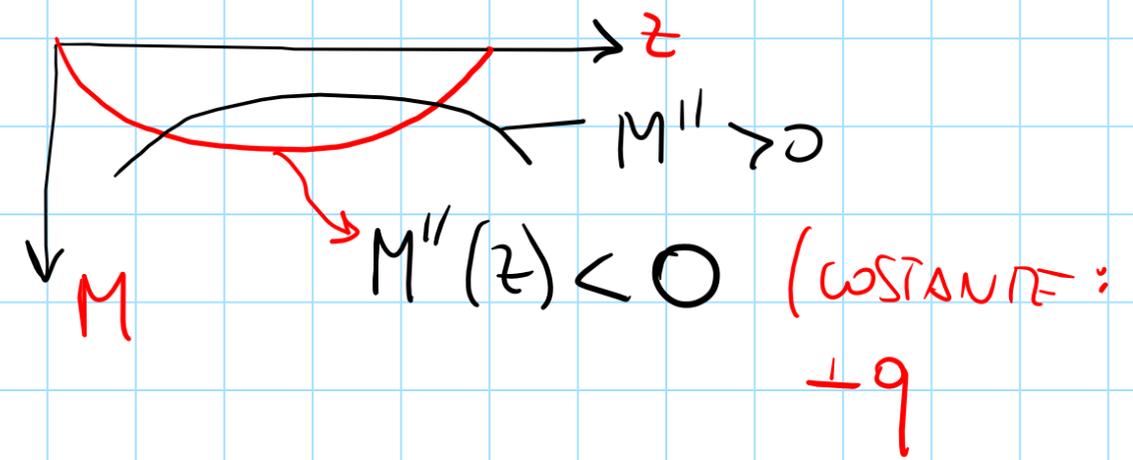
NON È  
INDISPENSABILE  
IL SEGNO



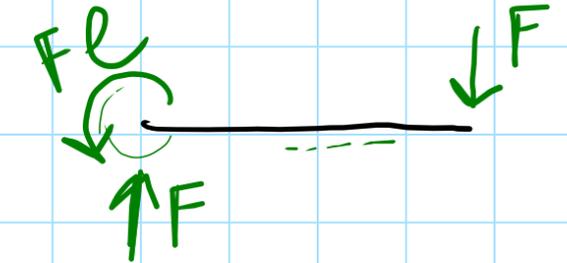
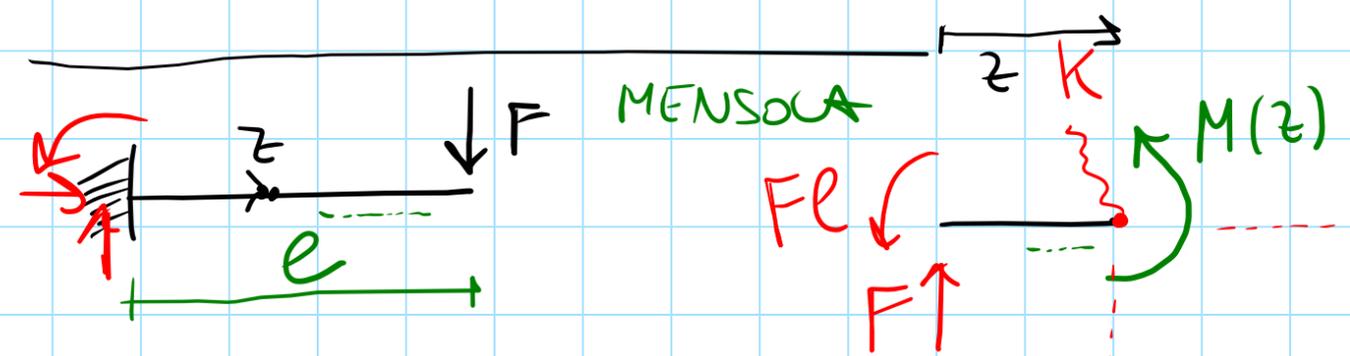


FIBRE CHE SI ACCORCIANO

FIBRE CHE SI ALLUNGANO



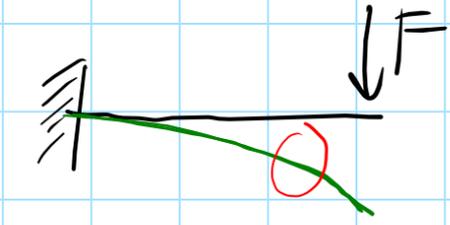
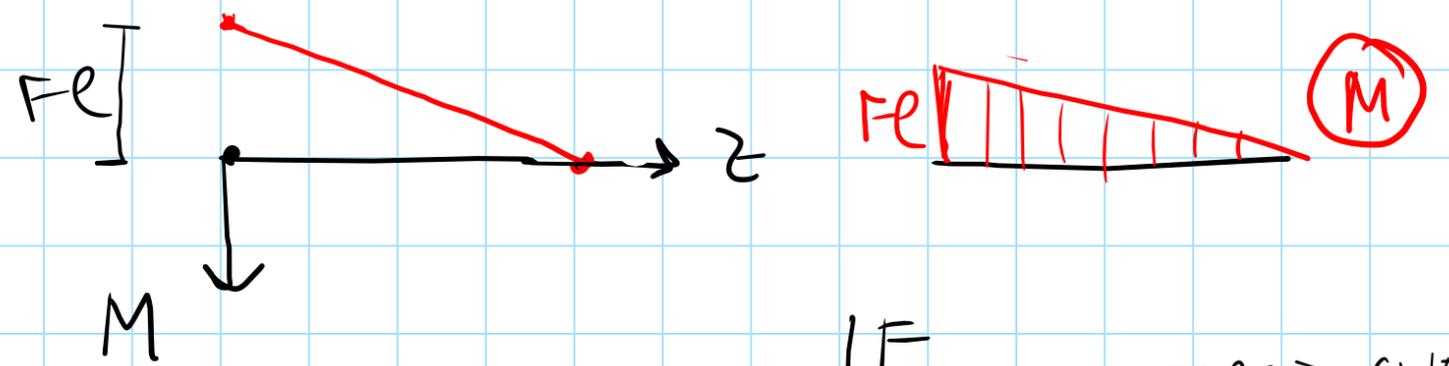
IL DIAGRAMMA DEL MOMENTO VIENE AUTOMATICAMENTE RIPORTATO DALLA PARTE DELLE FIBRE TESE.



S.C.L. EQUIL.

$$+\curvearrowleft K : -Fz + Fe + M(z) = 0$$

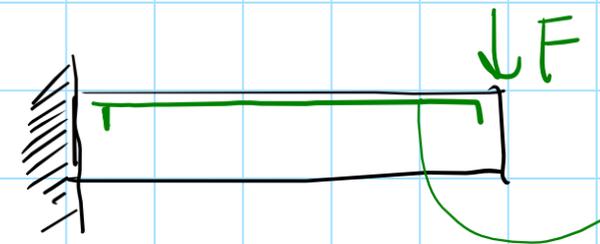
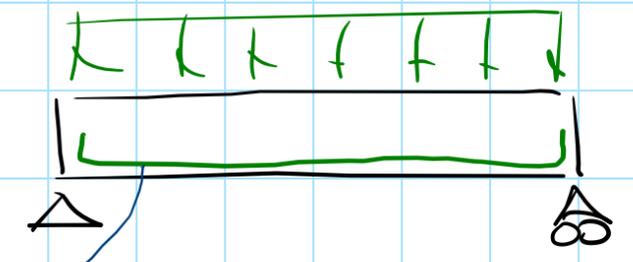
$$M(z) = Fz - Fe \quad z \in [0, e]$$



FIBRE CHE SI ALLUNGANO (TESE)

TRAVE IN C.A.

ARMATURA  
ALL'INTRODOSSO  
(FIBRE TENSE)



ARMATURA  
ALL'ESTRODOSSO

