PROSEGUIAMO CON UN ES SULLE CDS

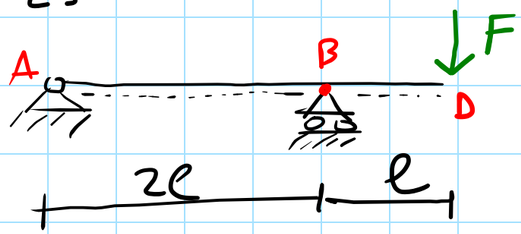
4/11/25

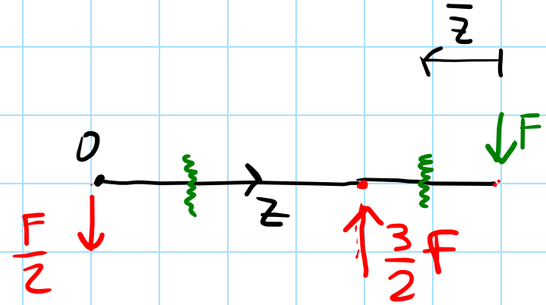
È OBBLIG. RIPORTARE IL SEGNO NEI DIAGR. N, Q

DOPO AVER DISEGNATO OSSERVIAMO CHE

(M) È SEMPRE RIPORT. DALLA PARTE DELLE FIBRE TESE

ES

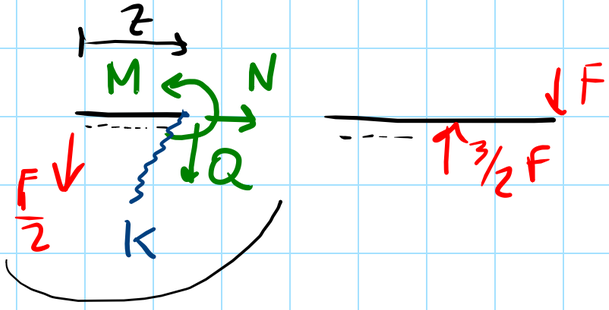




S.C.L. EQUIL.

I DOMIN. II DOMIN.

CALCOLO CDS I DOMINIO $(z \in]0, 2\ell[)$



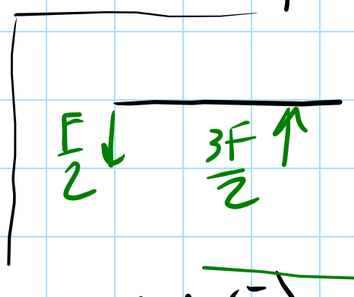
$\rightarrow: N(z) = 0$

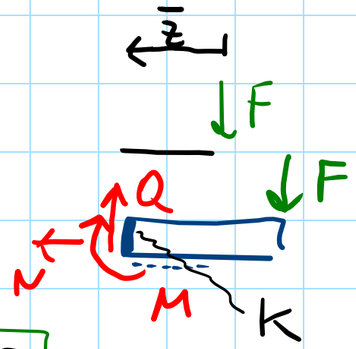
$+\downarrow: +\frac{F}{2} + Q(z) = 0$

$+\circlearrowleft_K: +\frac{F}{2} z + M(z) = 0$

$Q(z) = -\frac{F}{2}$; $M(z) = -\frac{F}{2} z$

II DOM. $(\bar{z} \in]0, \ell[)$





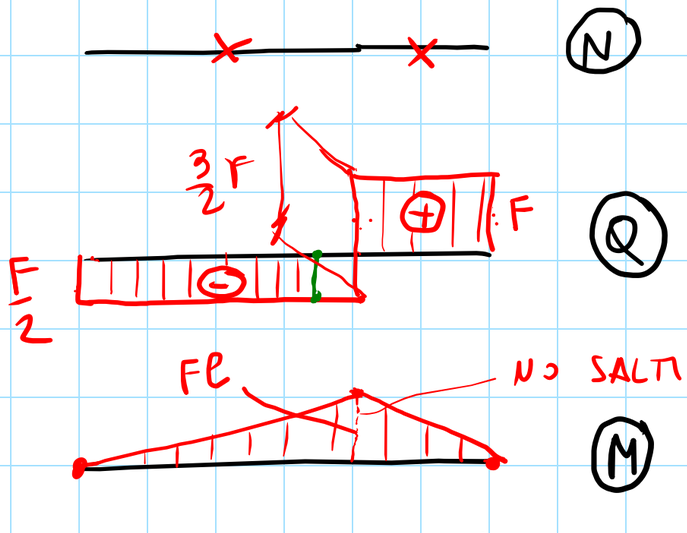
$+\leftarrow: N(\bar{z}) = 0$

$+\uparrow: Q(\bar{z}) - F = 0$

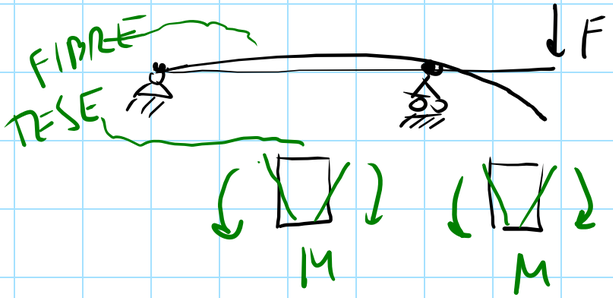
$+\circlearrowleft_K: -M(\bar{z}) - F\bar{z} = 0$

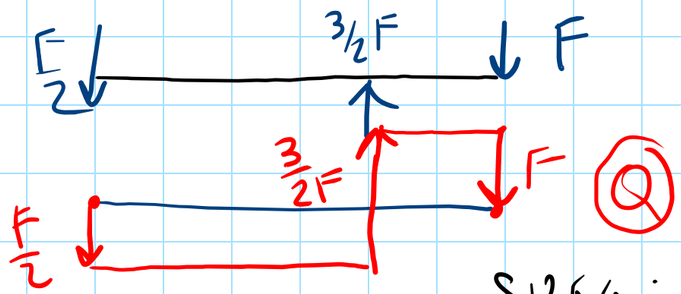
$Q(\bar{z}) = +F$; $M(\bar{z}) = -F\bar{z}$

DIAGR.

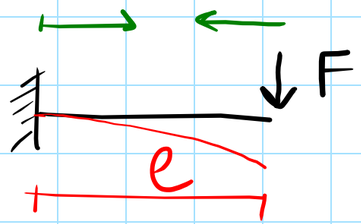


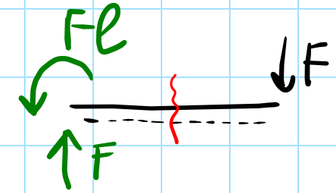
NO SALTI PERCHE' NO MOM CONCENTRATI

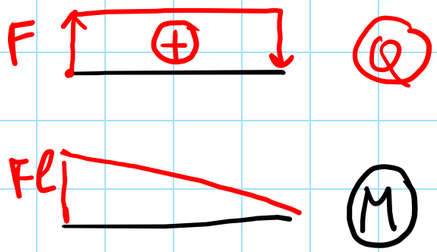




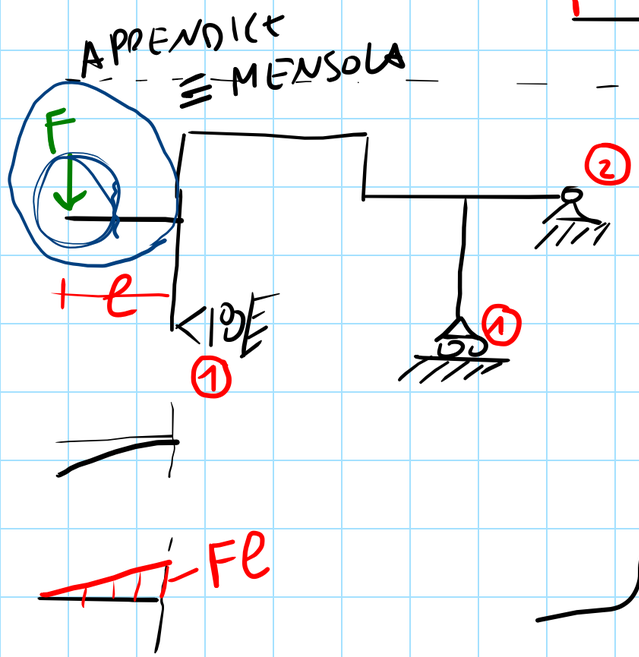
RAGIONIAMO SULLA MENSOLA (SN F)



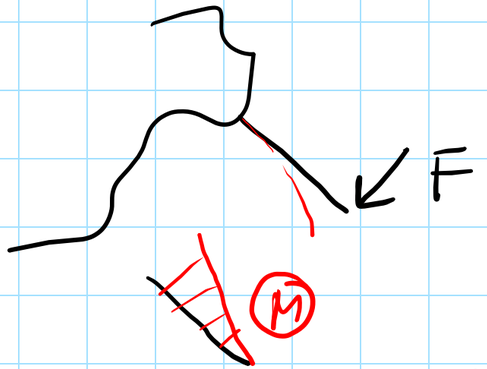




APPENDICE ≡ MENSOLA



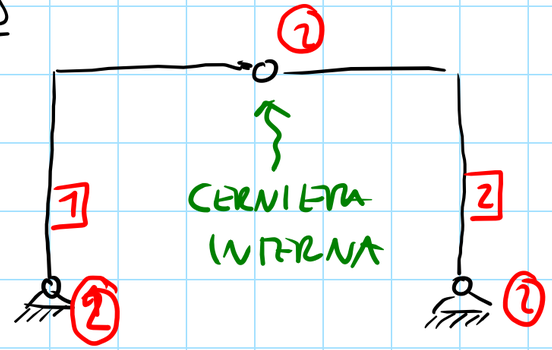
② STR. 1 VOLTA IPERS



SUGG: OTTENERE I DIAGR INVERTENDO LA "TRATTEGGIATA"

STRUTTURE ARTICOLATE (COMPOSTE) (=: STR CON VINCOLI 'INTERNI' ;=: STR CON PIÙ C.RIGIDI)

ES



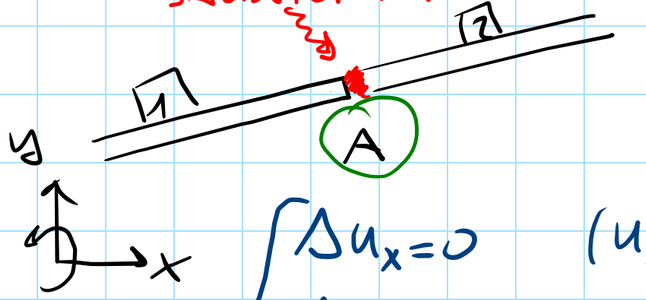
VINCOLO INTERNO: DISPOSITIVO IN GRADO DI LIMITARE IN TUTTO (O IN PARTE) UNA COMPONENTE DI MOTO RELATIVO DI UN SIST. MECCANICO

CLASS. VINCOLI INTERNI

- INCASTRO INTERNO ($\nu = 3$)

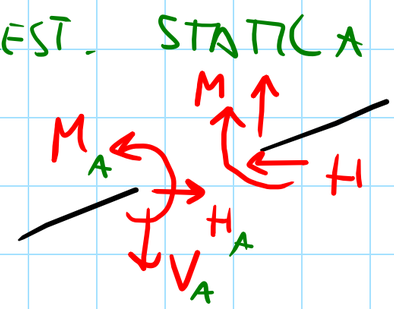
(PRESTAZ. CINEMATICO)

SALDATURA (STABILISCE LA PERFETTA CONTINUITÀ MATERIALE) ⇒ 2 C.R. IN PARTENZA ⇓ 1 SOLO C.R.



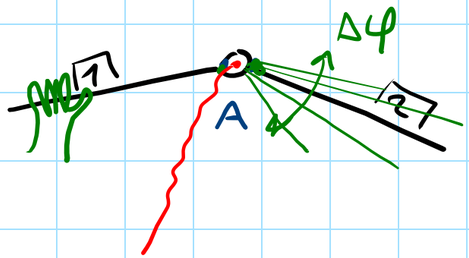
$$\begin{cases} \Delta u_x = 0 \\ \Delta u_y = 0 \\ \Delta \varphi = 0 \end{cases} \qquad (u_x^1 - u_x^2 = 0)$$

PREST. STATICA



3 INC. STATICHE ($V_A H_A M_A$)

– CERNIERA INTERNA ($\nu = 2$)

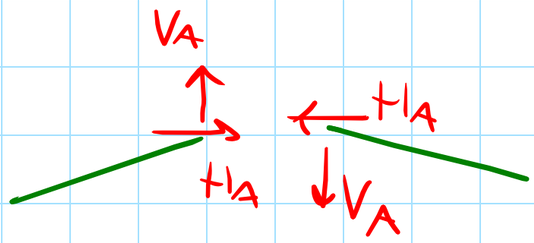


$$\underline{u}_{A_1} = \underline{u}_{A_2}$$

$(\Delta\varphi \neq 0)$ (ROTAZ. RELATIVA LIBERA)

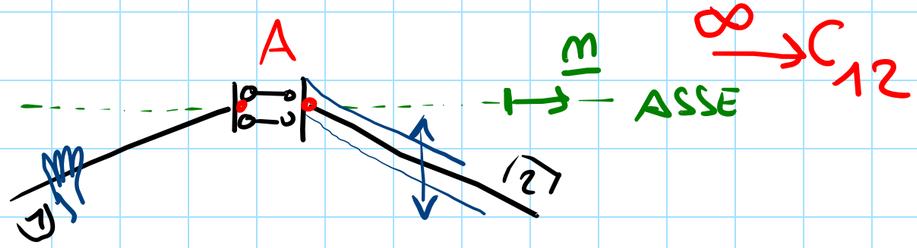
C.I.R. RELATIVA

$C_{12} = A$



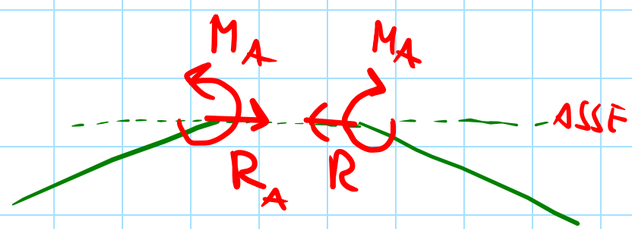
2 INCOGNITE STATICHE
V_A, H_A

– DOPPIO PENDOLO INTERNO ($\nu = 2$)



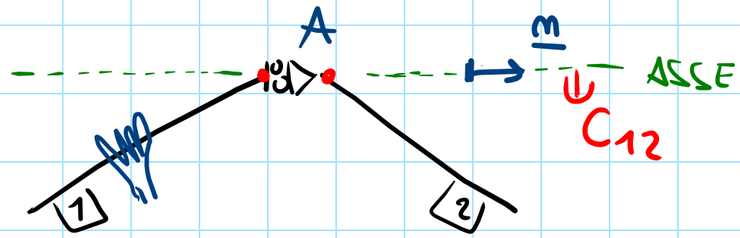
TRASLAZ. RELATIVA TRASVERS. ALL'ASSE LIBERA

$$\begin{cases} \varphi_1 = \varphi_2 \\ \underline{u}_{A_1} \cdot \underline{m} = \underline{u}_{A_2} \cdot \underline{m} \end{cases}$$



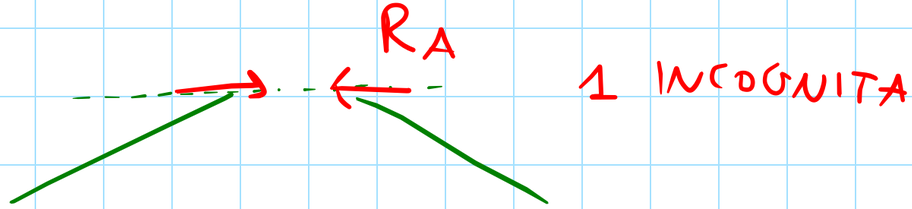
2 INC. STATICHE

- CARRELLO (PENDOLO) INTERNO ($r=1$)



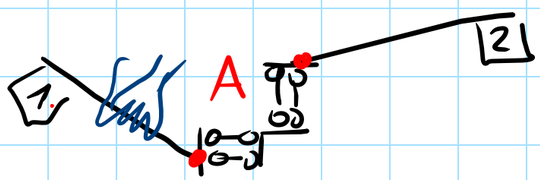
$$\underline{u}_{A_1} \cdot \underline{m} = \underline{u}_{A_2} \cdot \underline{m}$$

1 EQ. SCALARE

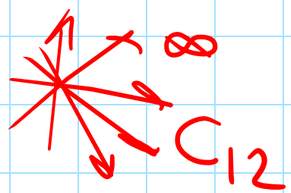


1 INCOGNITA

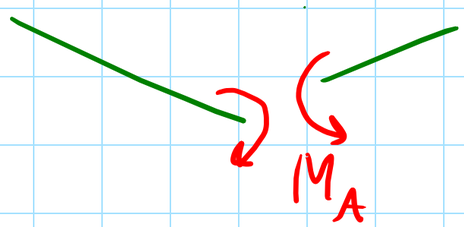
- DOPPIO-DOPPIO PENDOLO INTERNO



$$\varphi_1 = \varphi_2$$

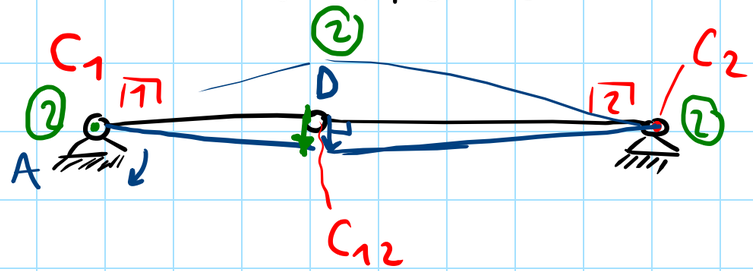


TRASLAZIONE LIBERE



1 INCOGNITA

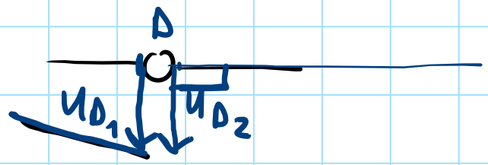
ESEMPI DI DISP. NON EFFICACE DI VINCOLI IN STR. ARTICOLATE



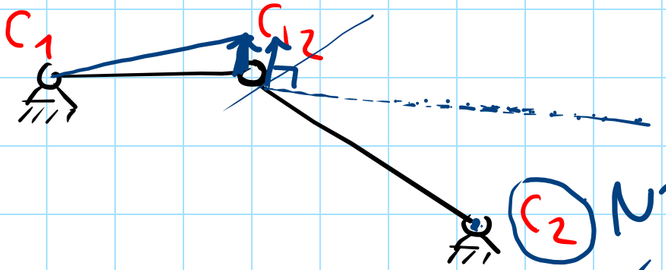
$g=6$, $v=6$

$\boxed{\delta=5}$

PER LE TRE CERNIERE "ALLINEATE" LE 2 ROTOTRASL. INFINT. SI POSSONO EFFETTUAM. REALIZZ.



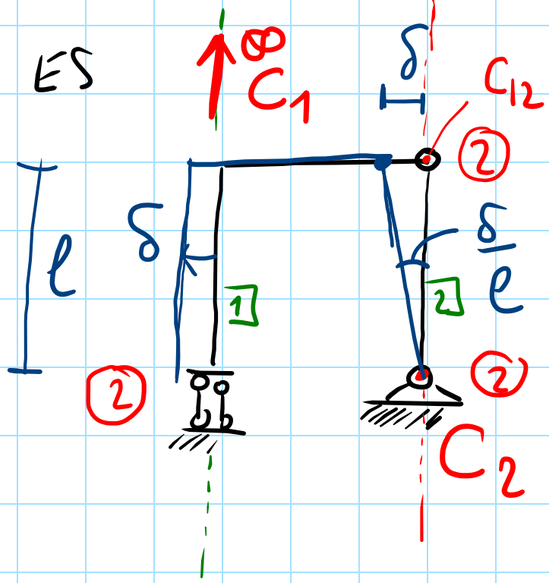
L'EVENTUALE ALLINEAMENTO DEI 3 C.I.R. $C_1 \leftrightarrow C_{12} \leftrightarrow C_2$



3 CERNIERE NON ALLINEATE ⇒ BUONA DISP. ($\delta=6$) SM ISOST.

REGOLA: QUANDO 3 (O PIÙ) VINCOLI, PER CUI $v=6$, COLLEGANO DUE CORPI RIGIDI, ALLORA SE SI REALIZZA $C_1 \leftrightarrow C_{12} \leftrightarrow C_2$ I VINCOLI SONO "MAL DISPOSTI"

ES



$g = 6$

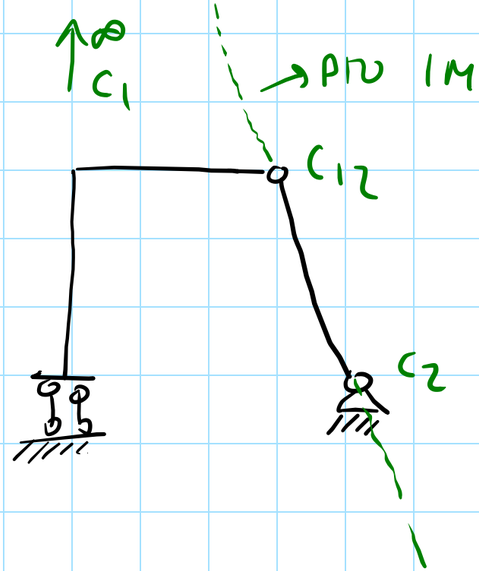
$v = 6$

$C_1 \leftrightarrow C_{12} \leftrightarrow C_2$

SI REALIZZA

$\Rightarrow$ VINCOLI MAL DISPOSTI

$(\Delta = 5)$



→ PTO IMPROPRIO NON ≡ CON C_1

~~$C_1 \leftrightarrow C_{12} \leftrightarrow C_2$~~

$\Delta = 6$

LA REGOLA DEGLI "ALLINEAMENTI" VIENE INDICATA SPESSO COME

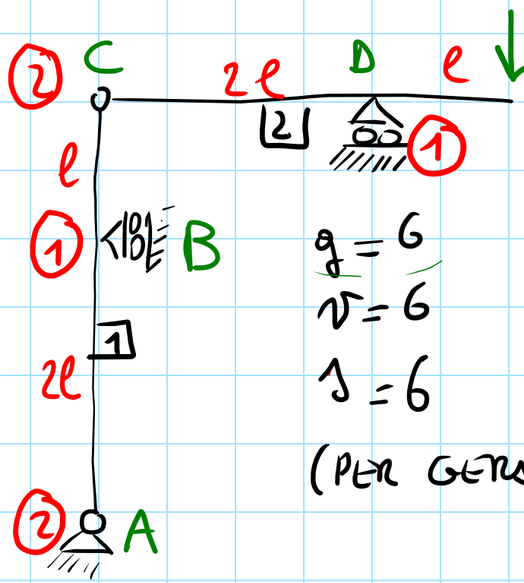
($C_1 \leftrightarrow C_{12} \leftrightarrow C_2 \Rightarrow \nexists$ CINEMATISMO)

I TEOREMA DELLE CATENE CINEMATICHE

CATENA CINEMATICA = CINEMATISMO = MECCANISMO : SIST. MECCANICA DOTATO DI 1 G.D.L.

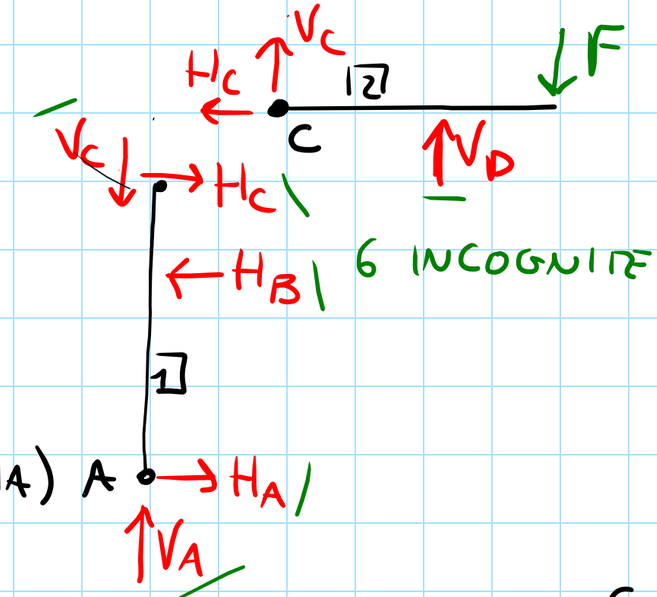
ANALISI STATICA DI STR. ARTICOLATE ISOSTATICHE ($g = v = 3$: SOLUZ. PROBLEMA STATICO UNICA)

METODO GENERALE: SI ISOLANO TUTTI I C. RIGIDI DELLA STRUTTURA METTENDO IN EVIDENZA TUTTE LE REAZ. VINCOLARI INCOGNITE; POI SI METTONO A SISTEMA TUTTE LE EQ. DI BILANCIO (3 E.C.S. $\forall$ C.R.) E SI CALCOLA LA SOLUZ.



$g = 6$
$v = 6$
$3 = 6$

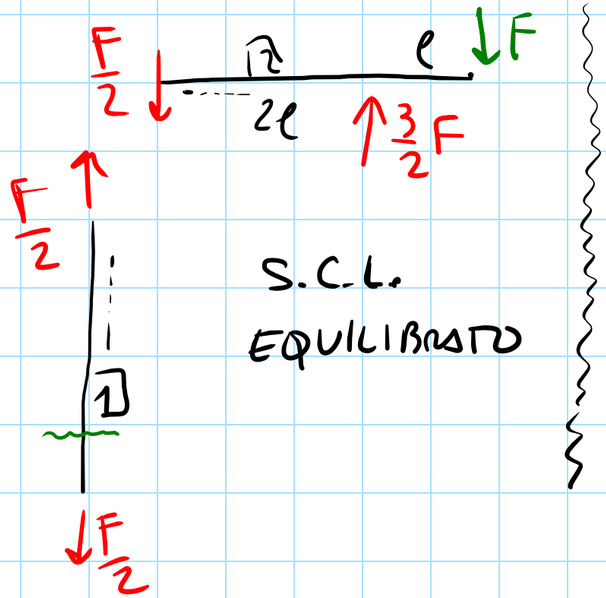
(PER GERARCHIA)



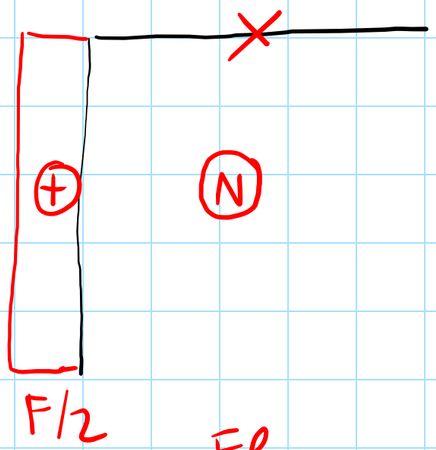
$$\begin{cases} \pm\rightarrow: +H_A - H_B + H_C = 0 \\ +\uparrow: V_A - V_C = 0 \\ +\circlearrowleft_A: +H_B 2\ell - H_C 3\ell = 0 \end{cases} \quad [1]$$

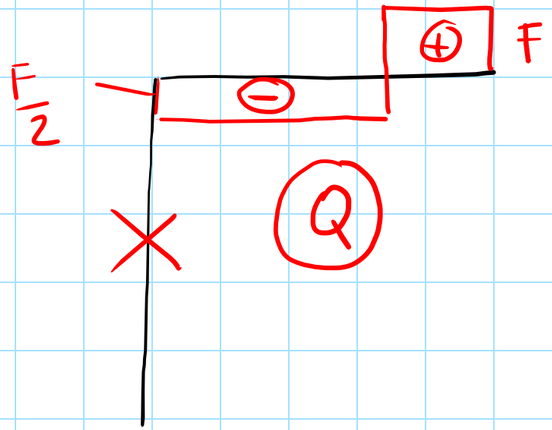
$$\begin{cases} \pm\rightarrow: -H_C = 0 \\ +\uparrow: V_C + V_D - F = 0 \\ +\circlearrowleft_C: V_D 2\ell - F 3\ell = 0 \end{cases} \quad [2]$$

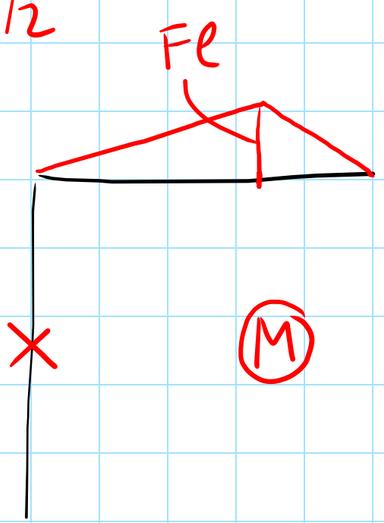
6 EQ IN 6 INC., SOLUZ. UNICA



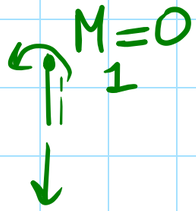
CDS

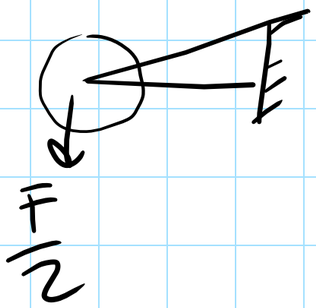




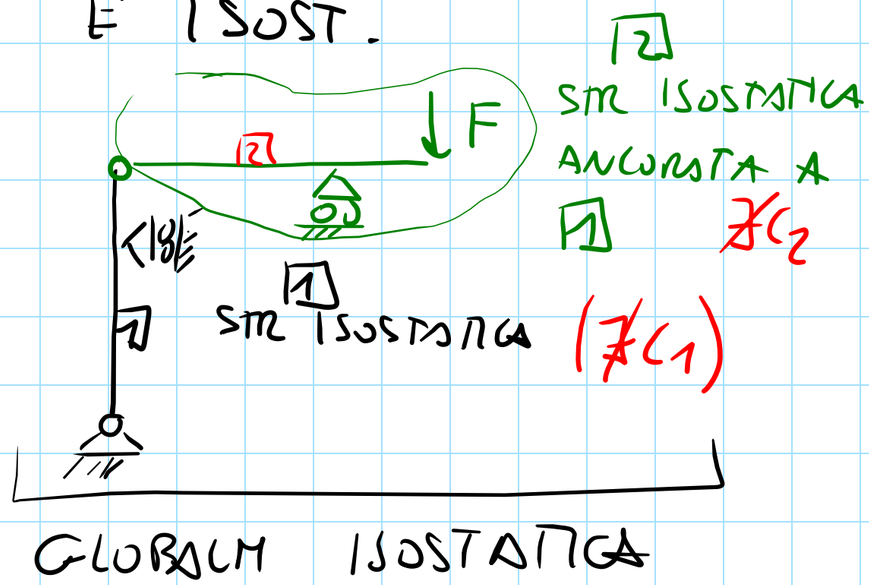


PERCHÈ LA STR. ASSEGNATA È ISOST.





PERCHÈ LA STR. ASSEGNATA È ISOST.



GLOBALM ISOSTATICA