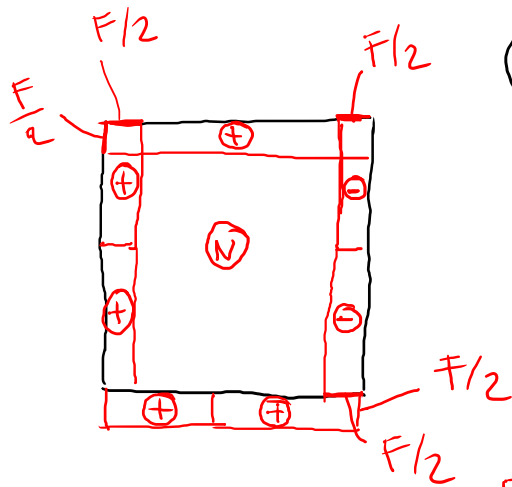
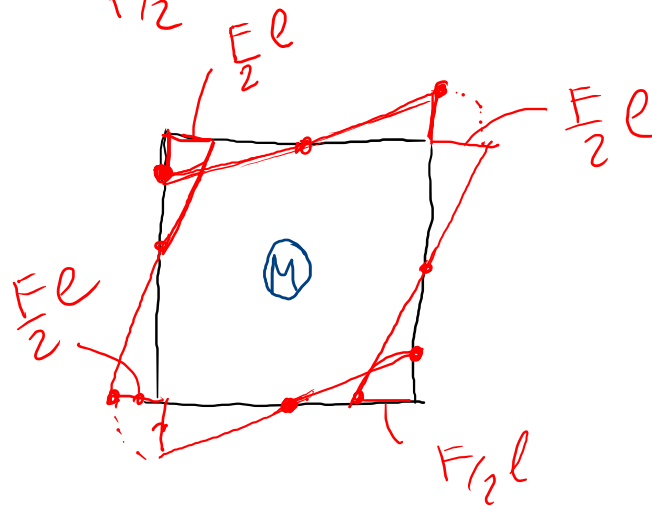
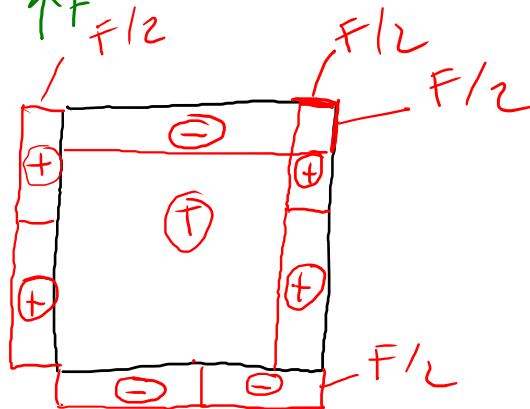
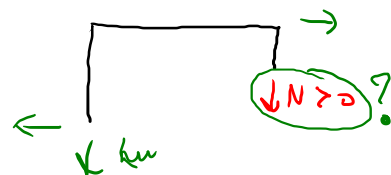


$-\frac{F}{2}$

SCL EQUILIBR.

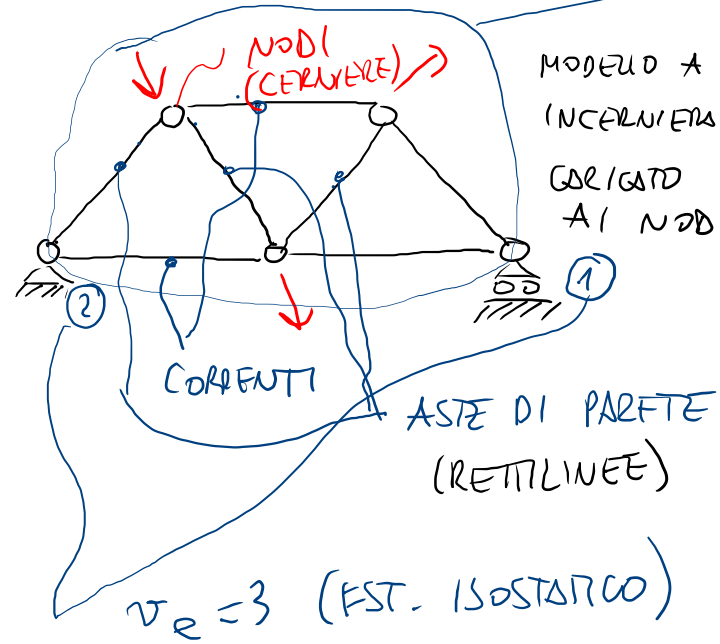


17/11/2022



STRUTTURE RETICOLARI

TRALICCIO



m_a : N° ASTE DELLA STRUTTURA (TUTTE)

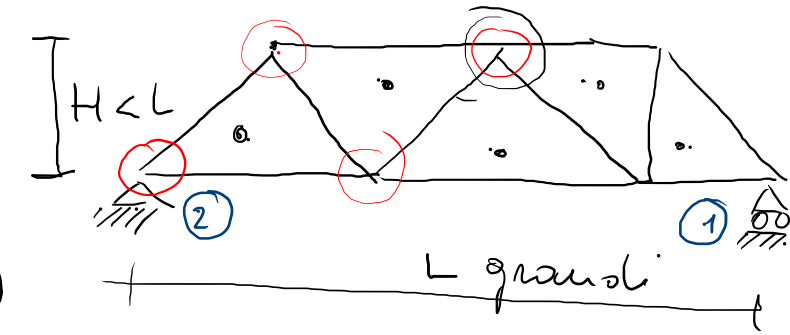
m_N : N° DEI NODI

v_e : MOLTEPLICITA' DI VINCOLO ESTERNO

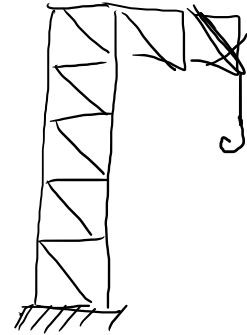
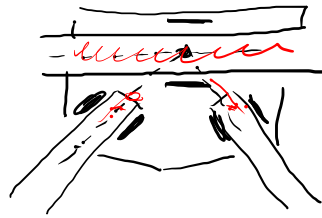
$$v_e = 3$$

$$i(\text{INTERNO})$$

$$= 15$$



$$(M < L) N_D$$

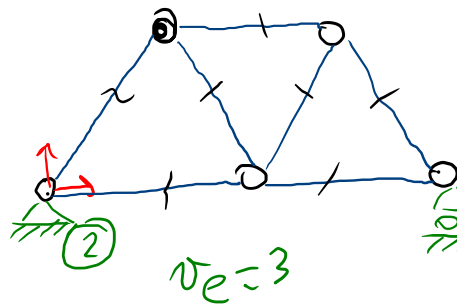


UNA CONDIZ. NECESSARIA DI ISOSTATICITA' E': (MAXWELL)

$$2m_N = m_a + v_e$$

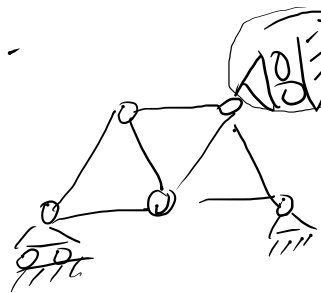
$$2m_N = m_e + v_e \quad (g = v \text{ NEUR STR. CLASSIC FIE}) \quad \text{?}$$

$g = g_{\text{del}}$ del SIST. LIBERO

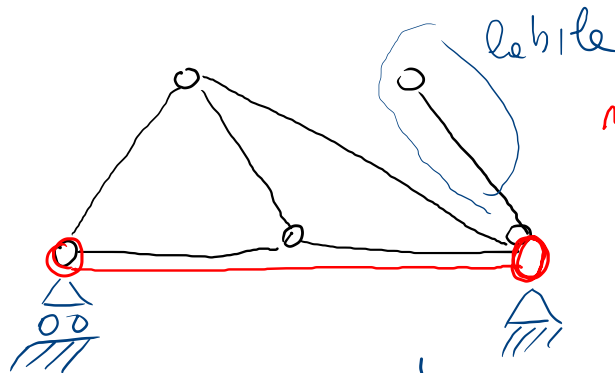


$$\begin{array}{r} 2m_N = 10 \\ \hline m_e = 7 \\ v_e = 3 \\ \hline 10 \end{array}$$

INTERN. VINCOLI BEN DISPOSTI PERCHÉ
RICONOSCA UNA STR. INTERNA CON
TRIANGOLI.

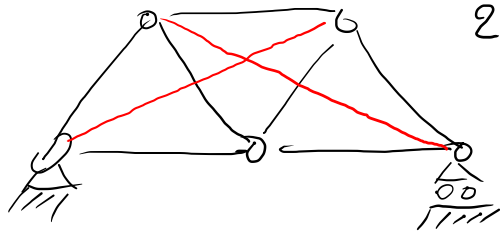


1 VOLTA
EASTERN.
1 PARISI
 $v_e = 4$



MASSALITÀ INTERNA

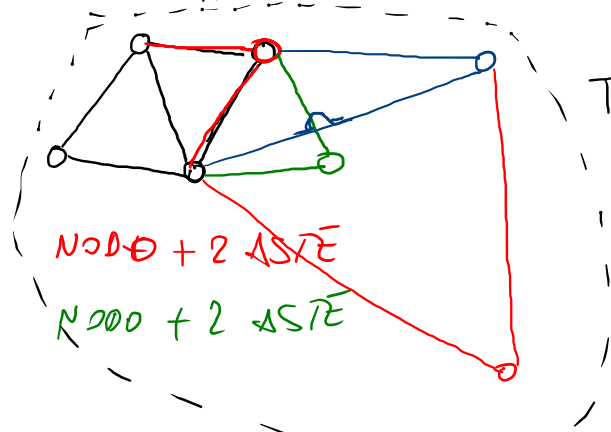
$$\begin{array}{r} m_e = 7 \\ r_e = 3 \\ \hline 10 \end{array}$$



2 grandi oli
VINCOLO INTERNO
SOPRA BORDANTI
= 2 VOLTE
INTERN. 1 PRST.

METODO PER COSTRUIRE UNA RETICOLARE ISOSTATICA

TRIANGOLO ISOSTATICO (C.R. CON 3 g.d.l. NEL PIANO)



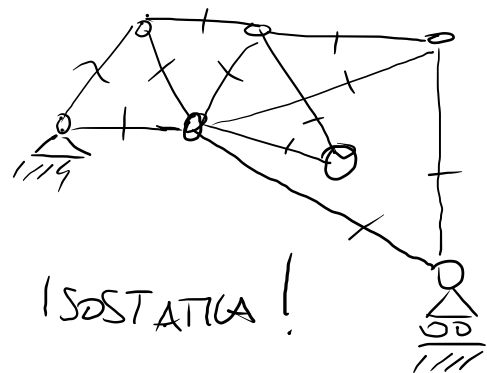
NODI + 2 ASTE

NODI + 2 ASTE

TRALICCIO

ISOSTATICO

(3 g.d.l. NEL PIANO)

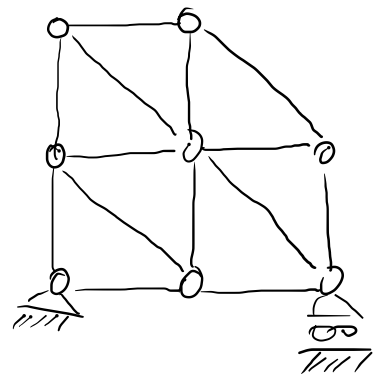


ISOSTATICA!

$$2 m_N = 14$$

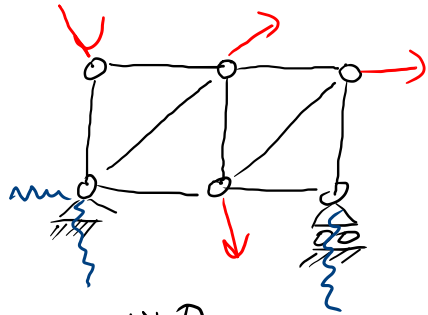
$$\begin{array}{l} m_e = 11 \\ v_e = 3 \end{array} \quad \left. \vphantom{\begin{array}{l} m_e = 11 \\ v_e = 3 \end{array}} \right\} 14$$

$v_e = 3$ SI PUO' RAGGIUNGERE ANCHE CON 3 CORRELLI



ISOSTAT ?
IPERSTAT ?

CONSIDERO COME CONDIZ. AI CARICO SOLO FORZÈ APPLICATE AI NODI ①



SE LA STR. È COSTITUITA DA ASTE RETTILINEE ②



L'UNICA CDS NELLE ASTE È N ($\frac{M}{T} = 0$)

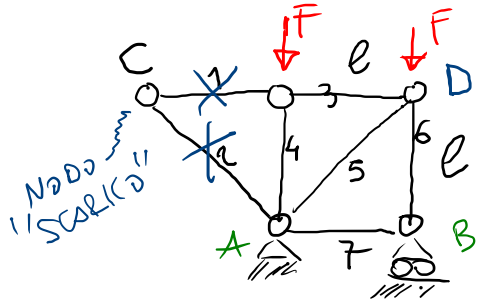
$N > 0$ ← ————— → ASTA TESA: "TIRANTE" — TIE-ROD

→ ————— ←
 $N < 0$ " COMPRESSA: "PUNTONE" — STRUT

PER CALCOLARE N IN TUTTE LE ASTE CERCO PRIMA DI EQUILIBRARE ESTERNAM.
LA STRUTTURA, POI ANALIZZO INTERNAMENTE IL TRALICCIO:

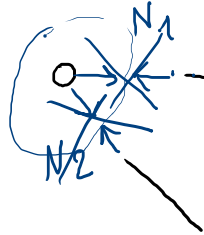
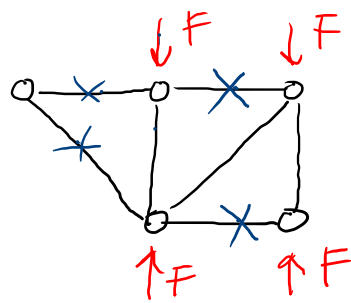
- METODO DEI NODI
- METODO DELLE SEZIONI (DI RITTER)

METODO DEI NODI (EQUILIBRIO NODALE)



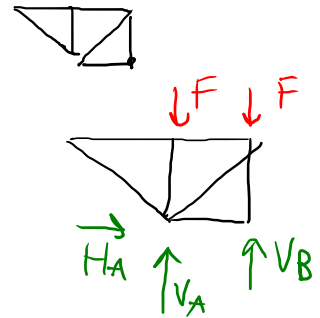
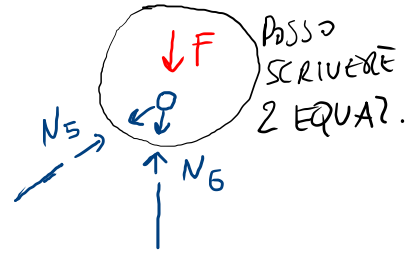
$$\begin{array}{r} 2m_N = 10 \\ m_e = 7 \\ n_e = 3 \\ \hline 10 \end{array}$$

CRITERI SPEDITIVI PER
RICONOSCERE ASTE SCORICHE



$$\begin{cases} N_1 + N_2 \frac{1}{\sqrt{2}} = 0 \\ -N_2 \frac{1}{\sqrt{2}} = 0 \end{cases}$$

$$N_1 = N_2 = 0$$

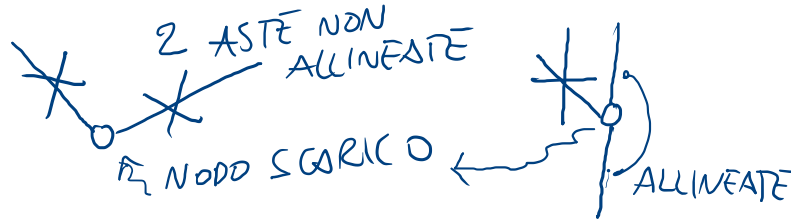


EQUILIBRIO ESTERNO

$$\rightarrow : H_A = 0$$

$$+\uparrow : V_A + V_B - 2F = 0$$

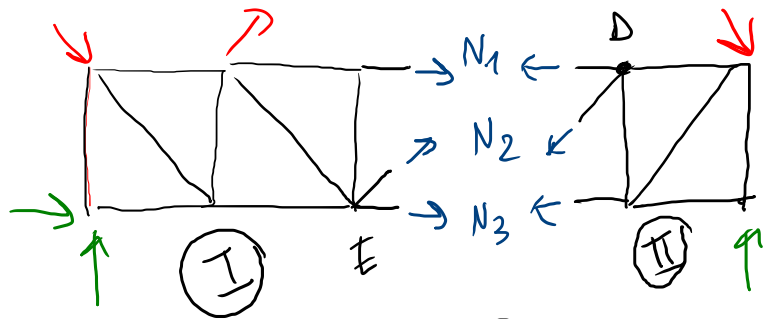
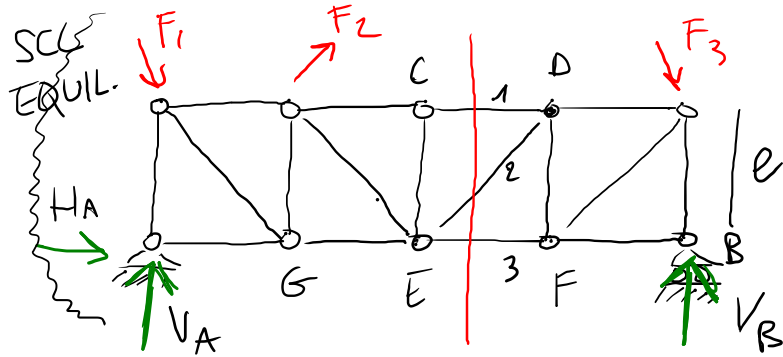
$$+\curvearrowleft : -F\ell + V_B\ell = 0$$



$$V_A = V_B = +F$$

$$H_A = 0$$

METODO DELLE SEZIONI (DI RITTER)



3 EQ. DI BILANCIO DI $\textcircled{\text{I}}$
 NELLE INCOGNITE N_1, N_2, N_3

$$2m_N = 20$$

$$m_e = 17$$

$$n_e = 3$$

$$20$$

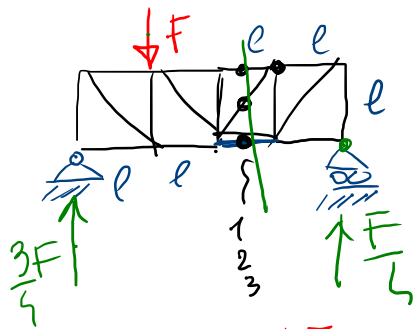
ISOSTATICA

RIESCO A SCRIVERE UNA EQUAZIONE
 PER UNA INCOGNITA

N_1 ? $\curvearrowright^+ \textcircled{\text{I}} \rightarrow \text{EQ. SOLO CON INCOGNITA } N_1$

N_3 ? $\curvearrowright^+ \textcircled{\text{II}} \rightarrow \dots \dots N_3$

N_2 ? $\uparrow : \textcircled{\text{I}} \rightarrow \dots \dots$ ENTRA LA COMPONENTE
 VERTICALE DI N_2



N_1, N_2, N_3 ?

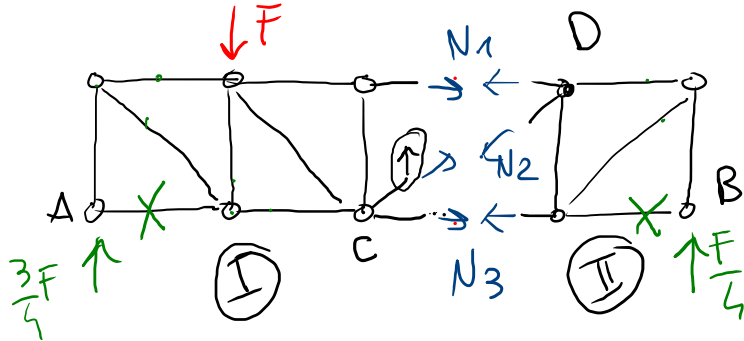
$$(N_1) : \curvearrowleft \textcircled{I} : -\frac{3}{4}F \cdot 2l + F \cdot l - N_1 \cdot l = 0$$

$$\boxed{N_1 = -\frac{F}{2}} \quad \text{PUNTONE}$$

$$(N_2) : +\uparrow \textcircled{I} : +\frac{3}{4}F - F + N_2 \frac{1}{\sqrt{2}} = 0$$

$$-\frac{1}{4}F = -\frac{N_2}{\sqrt{2}} ; \quad \boxed{N_2 = \frac{1}{4}\sqrt{2}F}$$

TIRANTE



$$(N_3) : \curvearrowleft \textcircled{I} : -\frac{3}{4}F \cdot 3l + F \cdot 2l + N_3 \cdot l = 0$$

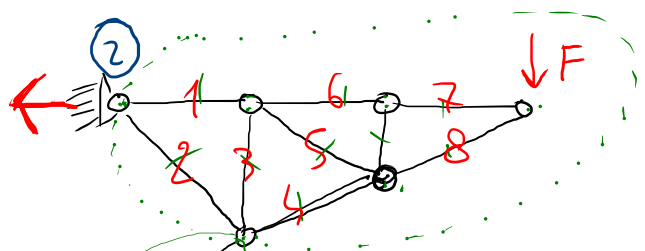
$$-\frac{9}{4}F + \frac{8}{4}F + N_3 = 0$$

$$\boxed{N_3 = +F/4} \quad \text{TIRANTE}$$



← "COPPIA INTERNA" →

ES



$$v_e = 3$$

$$m_e = 9$$

$$= 12$$

$$2m_N = 12$$

150ST.

