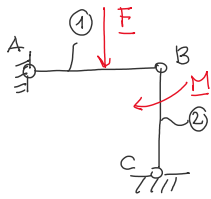


2 TIPOLOGIE DI CASI

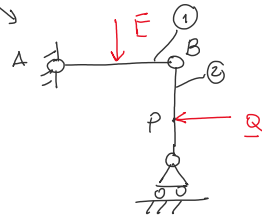


$$n_{gdl} = 2 \times 3 - 3 \times 2 = 0$$

NON SI PUO' MUOVERE \Rightarrow ISOSTATICHE

\Rightarrow punto valgono le reaz. vinc. per avere equ. statico?

\Downarrow
sta in equilibrio + sistema di forze attive



$$n_{gdl} = 2 \times 3 - 2 \times 2 - 1 = 1$$

\Downarrow
LABILE !!

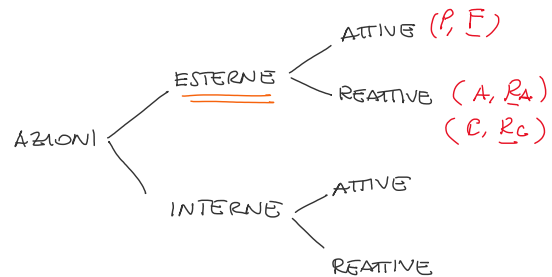
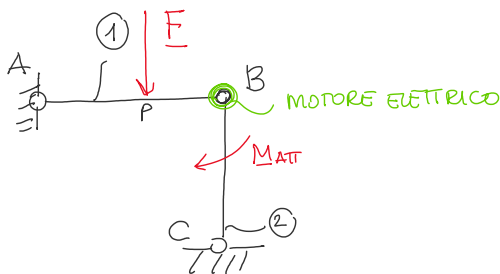
Nota un'azione esterna, valutare un'altra azione esterna che garantisca l'eq. statico

$(P, Q) \rightarrow Q_x, Q_y$

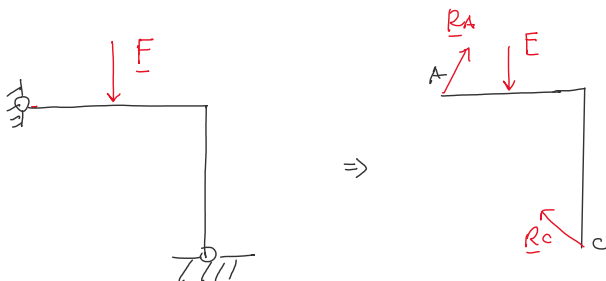
\Rightarrow nota la direzione di Q, trovare l'intensita'

\Downarrow
sta in equilibrio per CERTI sist. forze attive

AZIONI NEL SCR

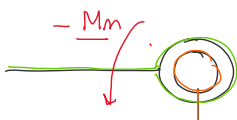


\Rightarrow SISTEMA COME SINGOLO CORPO

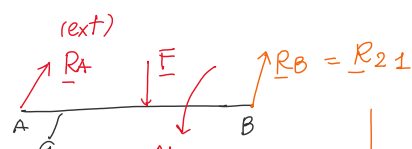


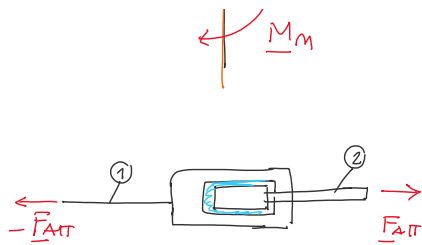
\Rightarrow AZIONI INTERNE

ACTIVE

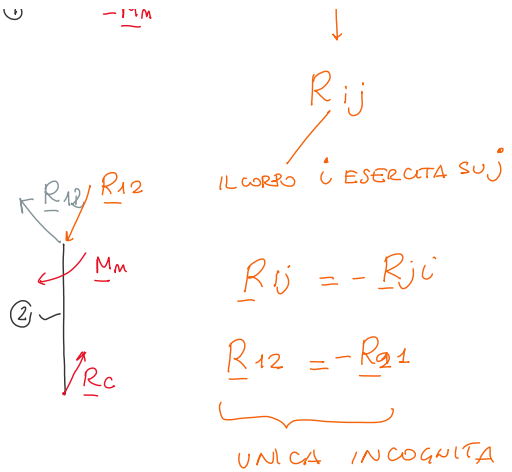


REACTIVE \Rightarrow ISOLIAMO i CORPI





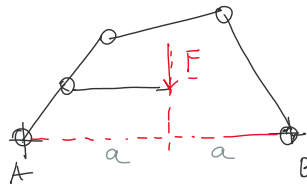
0 -17M



E_p^{mi} CARDINALI
 DELLA STAT. DEI
 SISTEMI DI CORPI RIGIDI

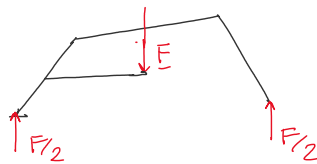
CONDIZIONE
 NECESSARIA
 MA NON SUFFIC.

$$\begin{cases} \underline{R}^{(ext)} + \underline{R}^{(int)} = \underline{0} \\ \underline{M}_0^{(ext)} + \underline{M}_0^{(int)} = \underline{0} \end{cases} \Rightarrow \begin{cases} \underline{R}^{(ext)} = \underline{0} \\ \underline{M}_0^{(ext)} = \underline{0} \end{cases}$$

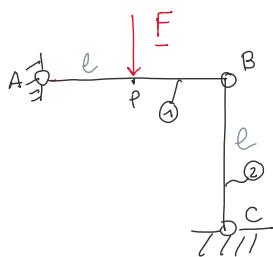


$$-F a + R_B 2a = 0$$

$$R_B = \frac{F}{2}$$



PROCEDURA DI SOLUZIONE



Richiesto

- 1) Reaz. vincolare esterne
- 2) Reaz. vinc. interne
- 3) DCL def. di ogni corpo

NOTO: (P, F)

$$l = \overline{AB}$$

$$l_2 = \overline{AP}$$

o) AGV $ngde = 2 \times 3 - 3 \times 2 = 0$ gde CER.

o) AFV $O A, B, C$ (R, R)

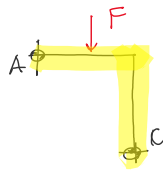
$\Rightarrow 2$ INCOGNITE $\times 3$ CERNIE $= 6$ INCOGNITE

1?) SISTEMA E' COMPLESSIVAMENTE ISOSTATICO? (SI) $\Rightarrow n^o$ incognite $= n^o$ equazioni

(6) INC $= 3 \times 2 = 6$
 E_p^{mi} CORPI

2?) SISTEMA E' ESTERNAMENTE ISOSTATICO? (NO)

↳ sistema = 1 CORPO RIGIDO



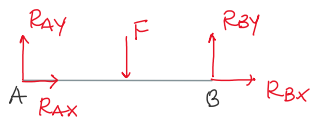
$$\begin{aligned} n^{\circ} \text{ incog.} &= n^{\circ} \text{ EQUAZ} = 3 \\ \text{REAZIONI VINCOL. ESTERNE} &\downarrow \\ \phi A &\Rightarrow 2 \\ \phi C &\Rightarrow 2 \\ \hline &4 \text{ INCOGNITE} \end{aligned}$$

3?) CORPI SCA RICHI?

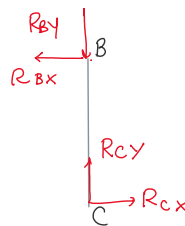
SOLUZIONE I

1) DCL PRELIMINARE

CORPO ①



CORPO ②



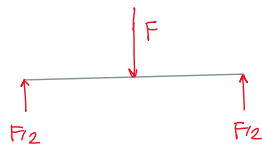
6 INCOGNITE

R_{AX}, R_{AY}
 R_{BX}, R_{BY}
 R_{CX}, R_{CY}

2) E_p^{st} STATICA SINGOLO CORPO

$$\begin{aligned} \text{①} \quad \begin{cases} x & R_{AX} + R_{BX} = 0 \\ y & -F + R_{AY} + R_{BY} = 0 \\ A \uparrow & -F \frac{l}{2} + R_{BY} l = 0 \end{cases} & \quad \text{②} \quad \begin{cases} B \leftarrow & -R_{BX} + R_{CX} = 0 \\ B \uparrow & -R_{BY} + R_{CY} = 0 \\ B \curvearrowright & R_{CX} l = 0 \end{cases} \\ \begin{cases} R_{AX} = 0 \\ R_{BY} = \frac{F}{2} \\ R_{AY} = F - R_{BY} = \frac{F}{2} \end{cases} & \quad \begin{cases} R_{CX} = 0 \\ R_{BX} = 0 \\ R_{BY} = R_{CY} \end{cases} \end{aligned}$$

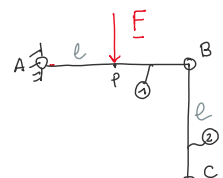
DCL DEFINITIVI

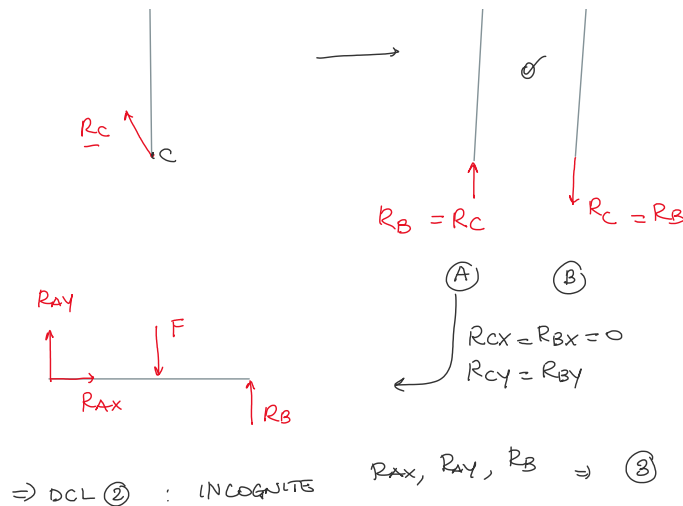


II SOLUZIONE

3?) CORPI SCA RICHI? → corpi su cui non ci sono azioni attive

CORPO 2 E' SCARICO

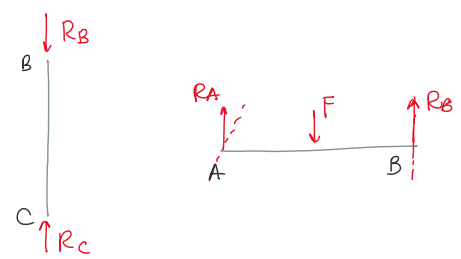




CONSIDERANDO
 I CORPI SCARICHI
 6 INCOGN.
 ↓
 3 INCOGN.

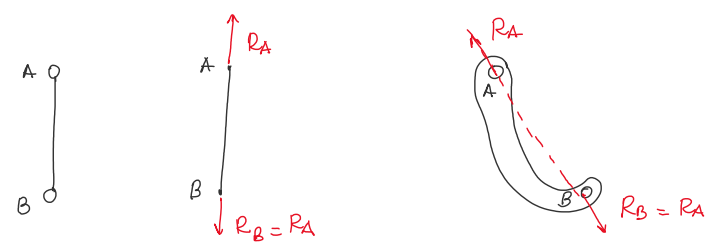
$\Rightarrow E_p^{w} \text{ CARD. STANCA } 2 \Rightarrow X \begin{cases} R_{ax} = 0 \\ R_{ay} + R_b - F = 0 \\ -F \frac{l}{2} + R_b l = 0 \end{cases}$
 $\begin{cases} R_{ax} = 0 \\ R_b = F/2 \\ R_{ay} = F/2 \end{cases}$

III SOLUZIONI

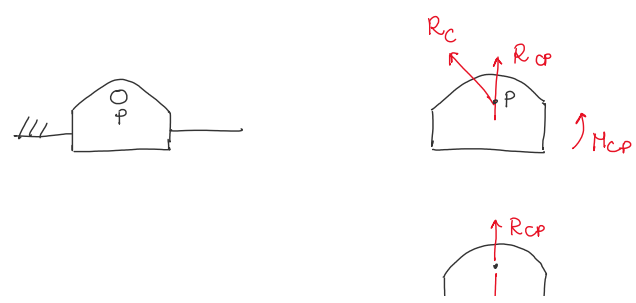


RAGIONANDO UN ALTRO PO'
 - "INDOVINO" IL VERSO CORRETTO R_b
 - R_a DEVE ESSERE VERTICALE
 ↓
 2 INCOGNITE

CORPI SCARICHI - ASTA SCARICA



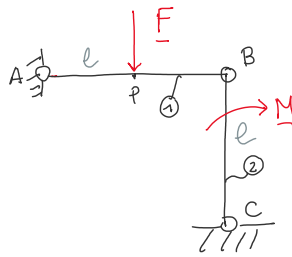
CORSO IO SCARICO



$\sum M_{cp} = 0$
 $R_c + R_{cp} = 0$
 $R_c = -R_{cp}$

$$R_c = R_{cp}$$

ESEMPIO 2



3?) NON A CORPI SCARICHI

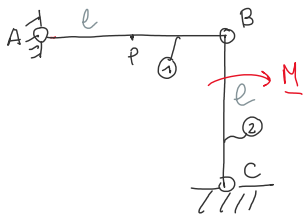
$$\Downarrow$$

$$6 E_p w_i + 6 INCOGNITE$$

$$a.e. \underline{\underline{MA}} \Rightarrow PSE$$

$$\begin{array}{cc} \text{I CASO} & \oplus & \text{II CASO} \\ \underline{F} & & \underline{M} \\ \underbrace{3 E_p w_i} & & \underbrace{3 E_p w_i} \end{array}$$

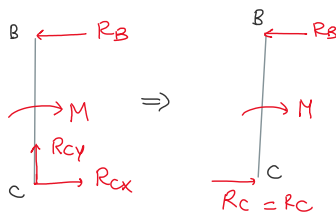
II CASO



1) DCL CORPO SCARICO ①



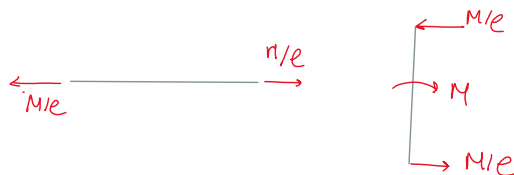
CORPO ②



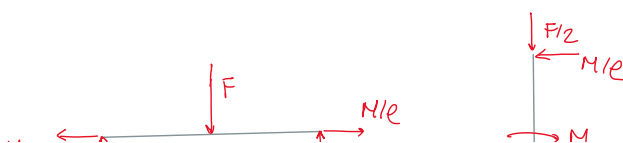
$$\textcircled{1} \text{ INCOG.: } R_B \Rightarrow \textcircled{2} \quad + R_B l - M = 0$$

$$R_B = R_C = R_A = M/l$$

DCL. DEFINITIVO



DCL DEF. \Rightarrow I CASO + II CASO



$M/2$ |
 $F/2$

|
 $F/2$

..
|
↑ $F/2$ → $M/2$