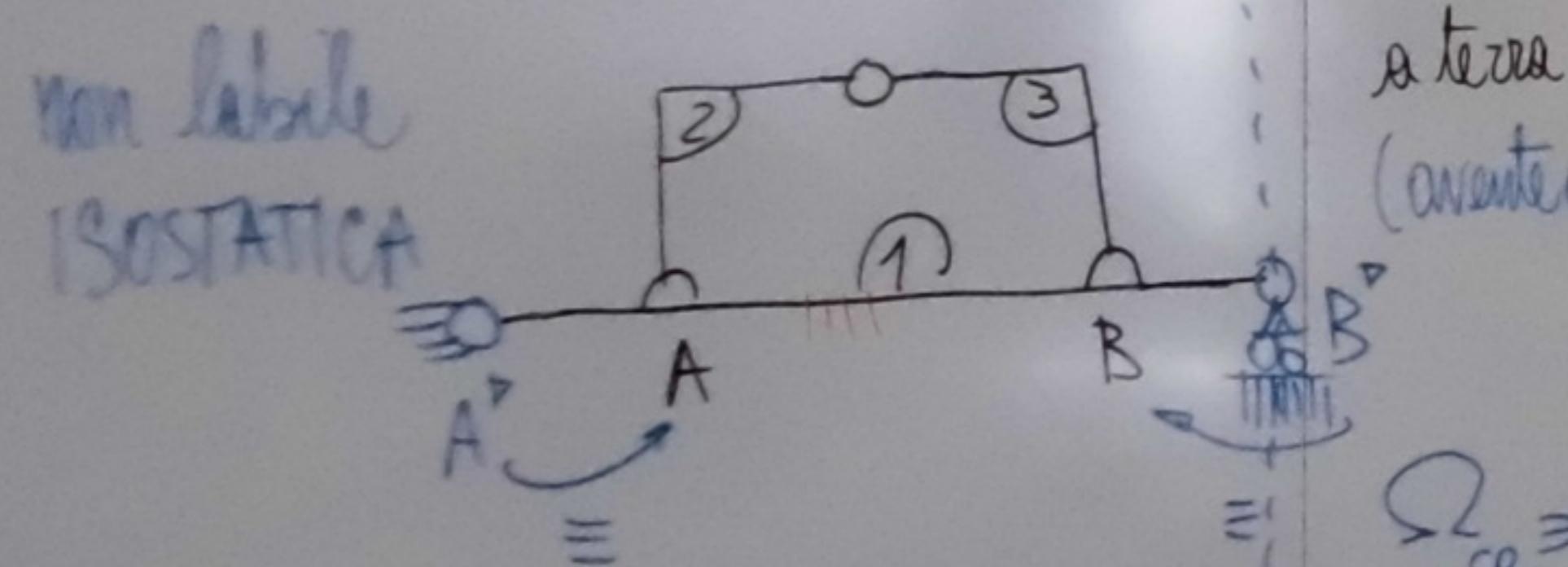
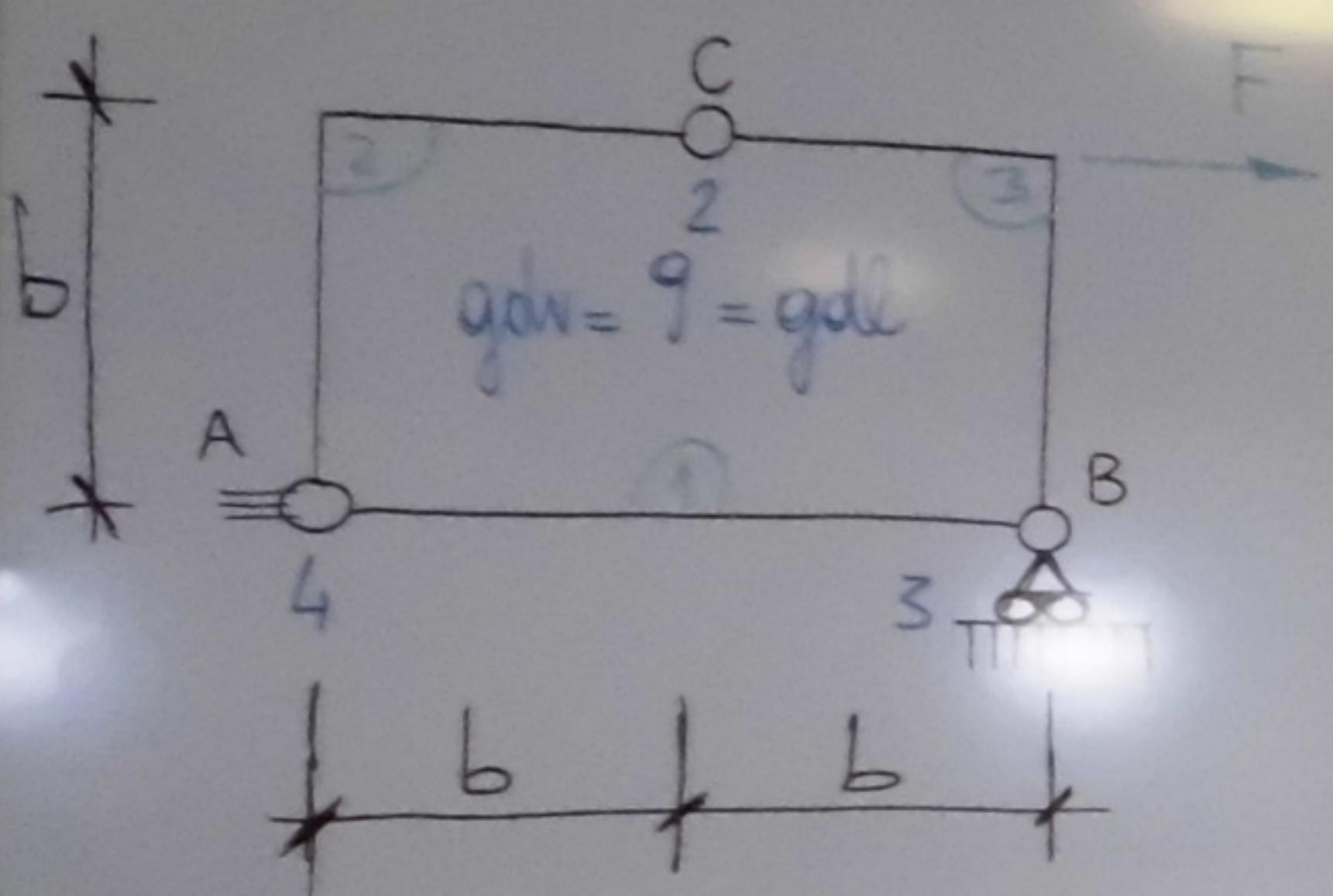
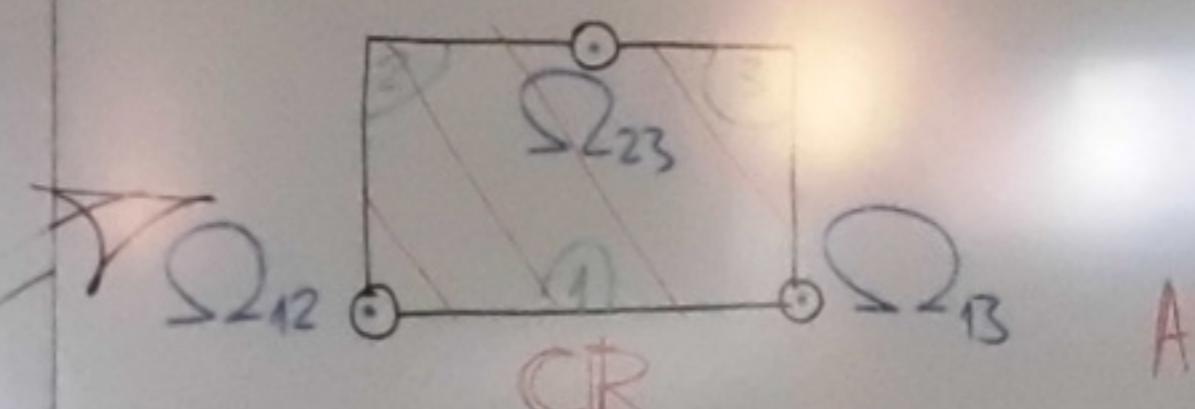


Calcolo RV, sistemi articolati

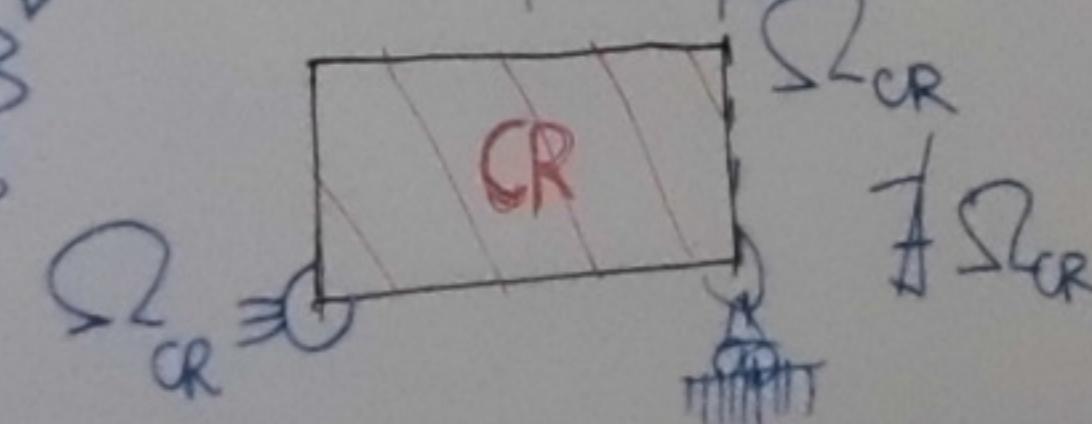


AC (due deduzioni alternative) :

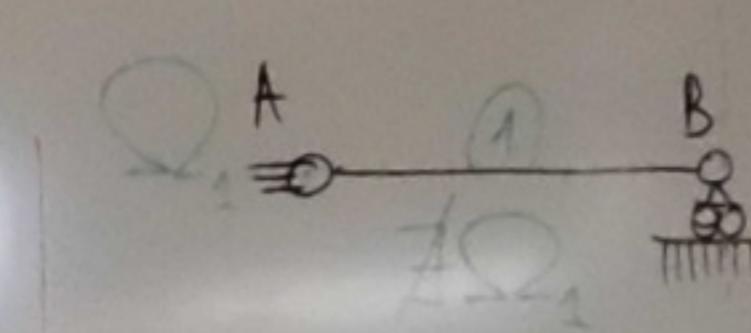
- ① Anello chiuso isostatico ABC, con tre corniere interne non allineate, equiv. ad un unico CR



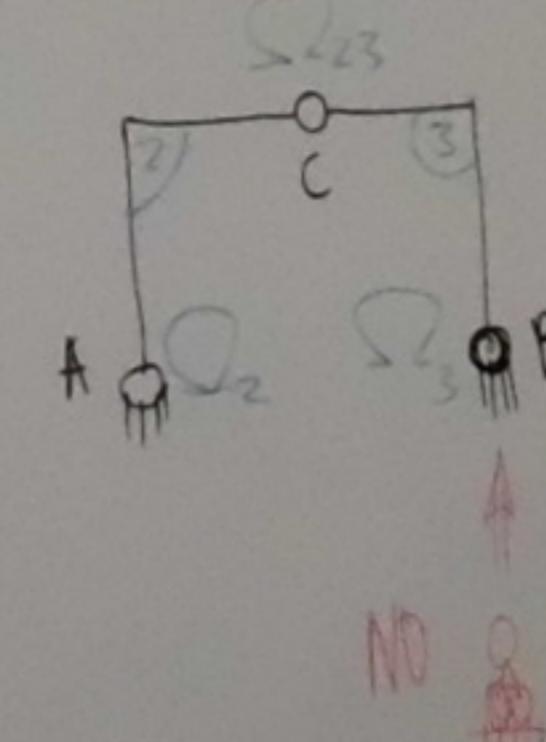
Tale anello chiuso isostatico i punto a terra con schema asta corniera-corrello (avente asse non passante per le corniere)



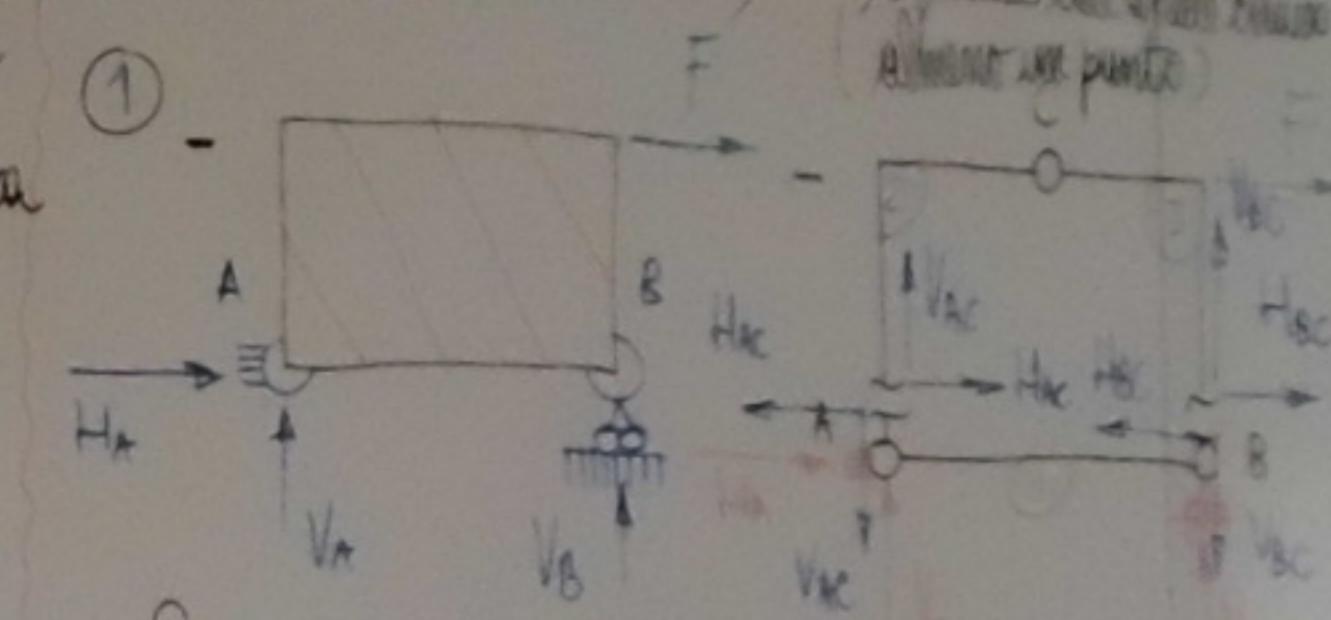
- ② Asta corniera-corrello avente asse non passante per le corniere



- Arco a tre corniere non allineate



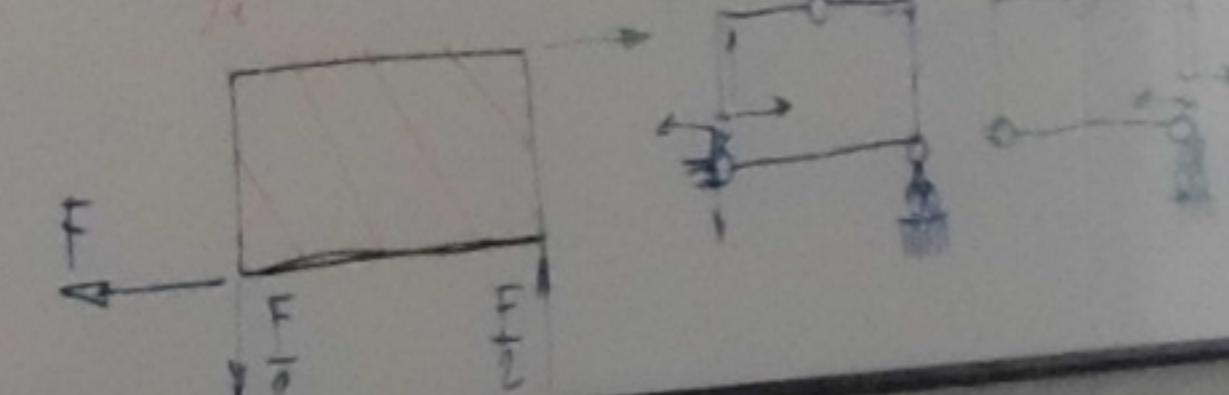
AS (secondo seguente inverso)



$$\begin{aligned} \sum F_x &= 0 \Rightarrow H_A = -F \\ \sum M_A &= 0 \Rightarrow V_B = \frac{F}{2} \\ \sum M_B &= 0 \Rightarrow V_A = -\frac{F}{2} \end{aligned}$$

Ci conduce alle 2 soluzioni di asse non passante per le corniere non allineate (ABC)

Sistema ad arco a tre corniere non allineate

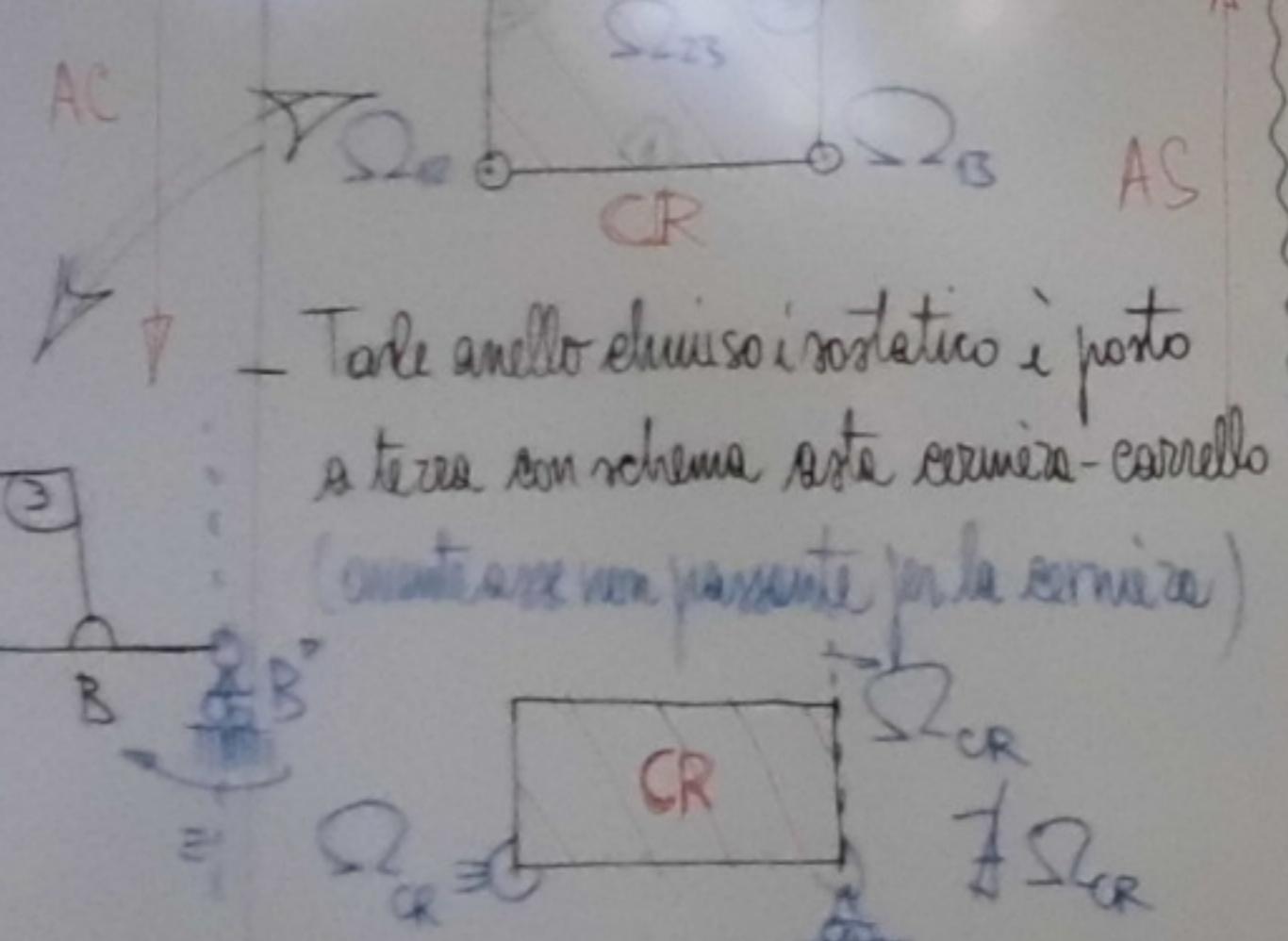
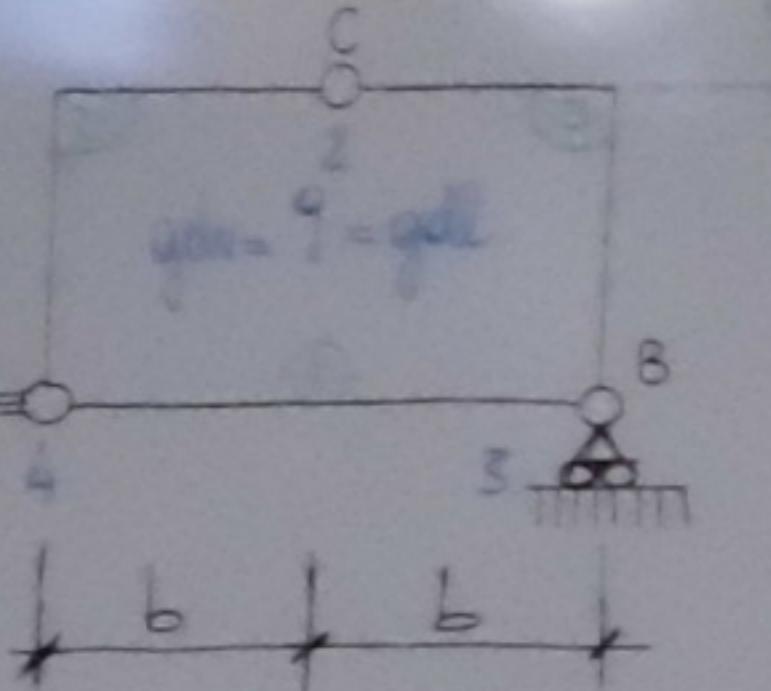


Soluzione di asse tra corniere non allineate

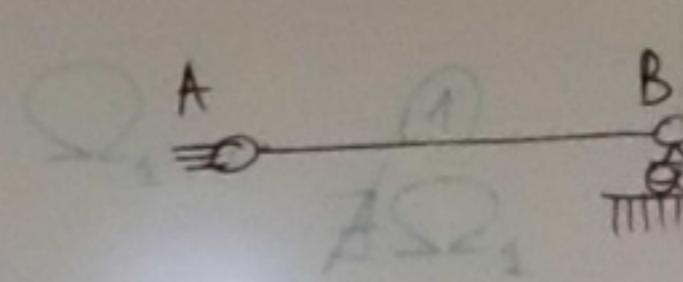
Calcolo RV, sistemi articolati

AC (due deduzioni alternative) :

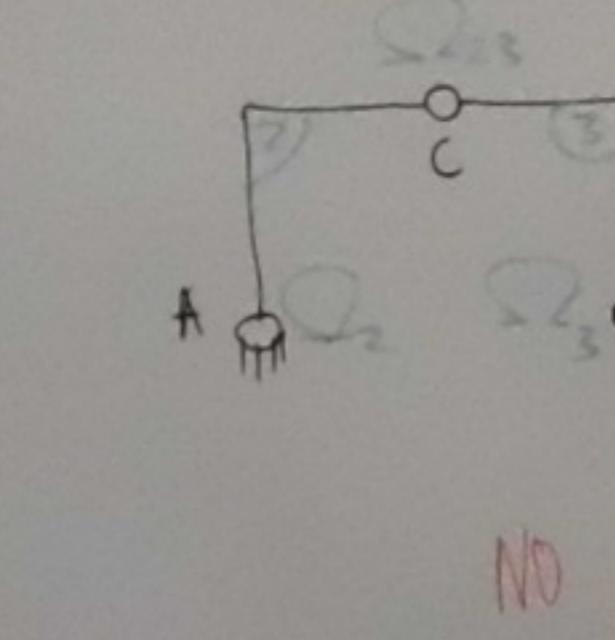
① Anello chiuso isostatico ABC, con tre corniere interne non allineate, qui ad un unico CR



② - Asta corniera - corollo avente ore non passante per la cornice qui ad un unico CR

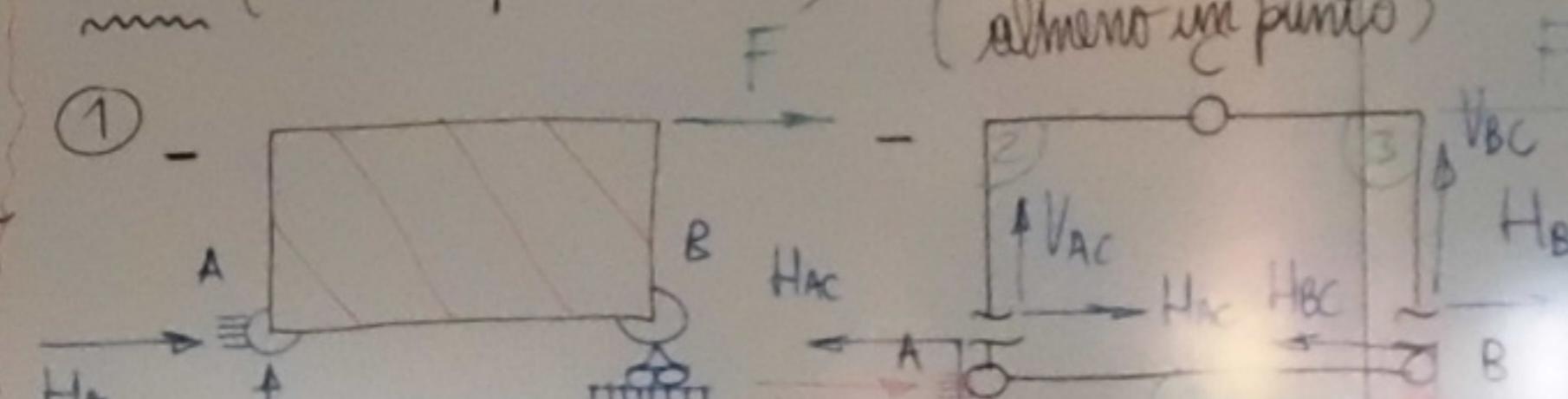


- Arco a tre corniere non allineate



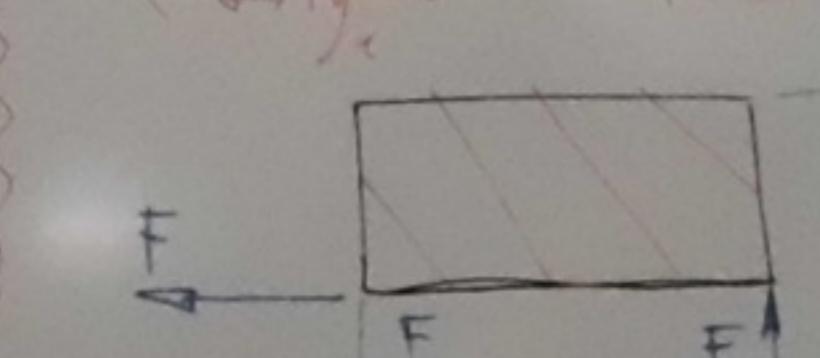
AS (seconda sequenza inversa)

"apertura dell'anello chiuso" (almeno un punto)



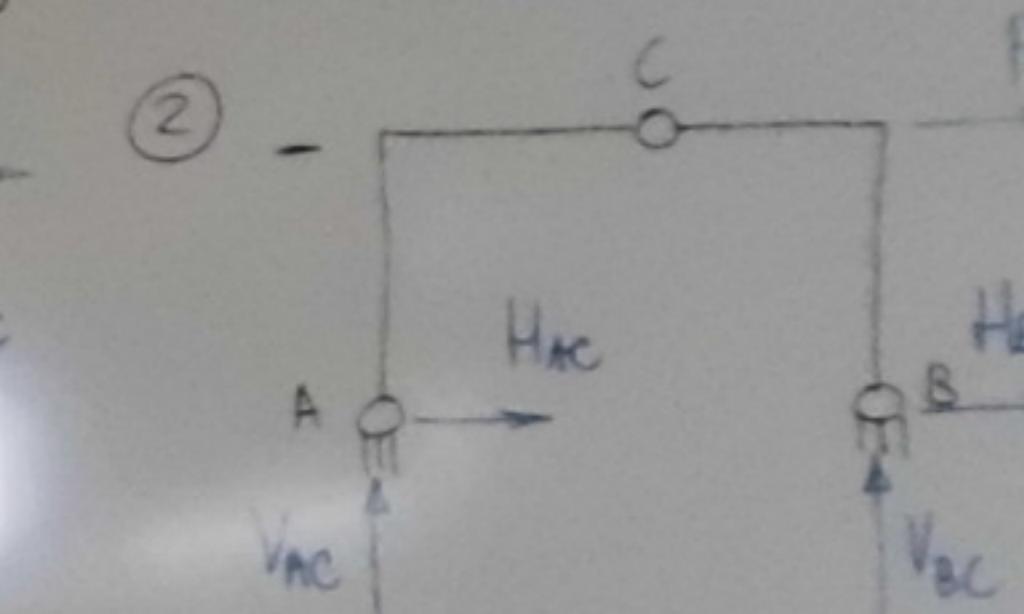
$$\begin{aligned} \sum F_x &\rightarrow H_A = -F \\ \sum M_A = 0 &\Rightarrow V_B = \frac{F}{2} \\ \sum M_B = 0 &\Rightarrow V_A = -\frac{F}{2} \end{aligned}$$

$$(\sum F_y = 0 \Rightarrow V_A + V_B = 0)$$

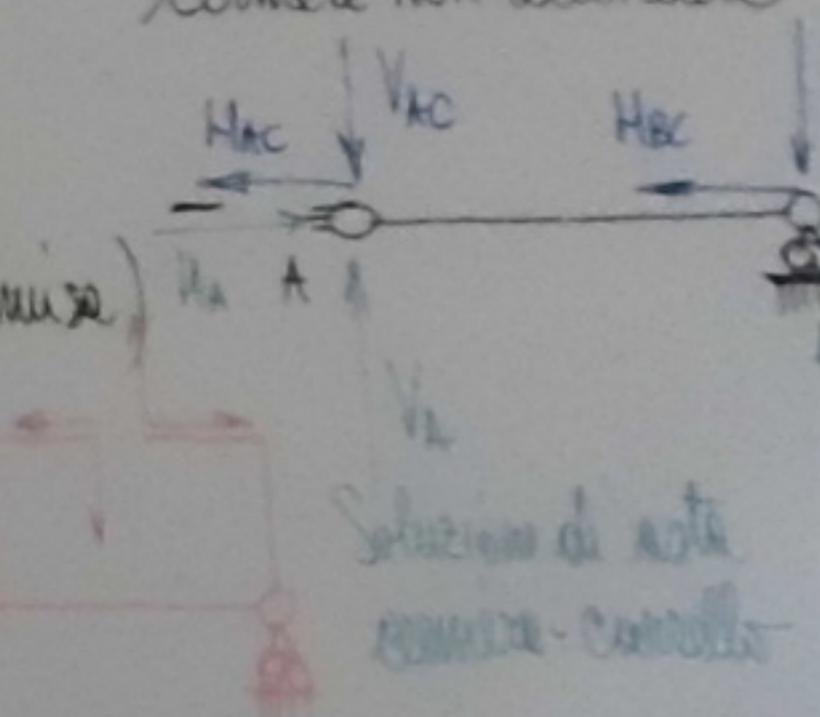


Ciò conduce alla risoluz di arco a tre corniere non allineate (ABC)

Schemi ad albero (senza maglie chiuse)



Soluzione di arco a tre corniere non allineate

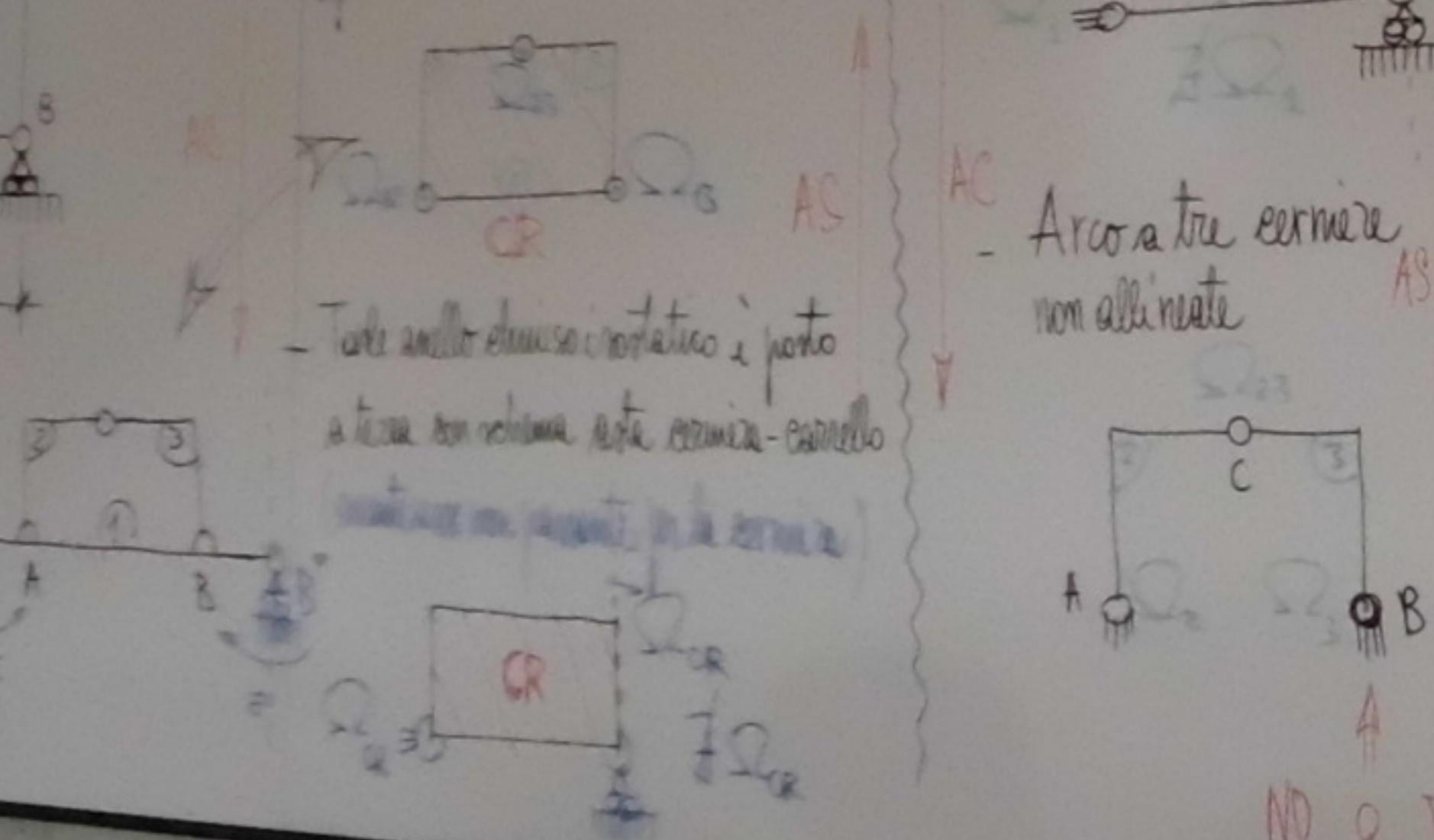


Soluzione di asta corniera - corollo

Calcolo di sistemi articolati

AC (due soluzioni alternative):

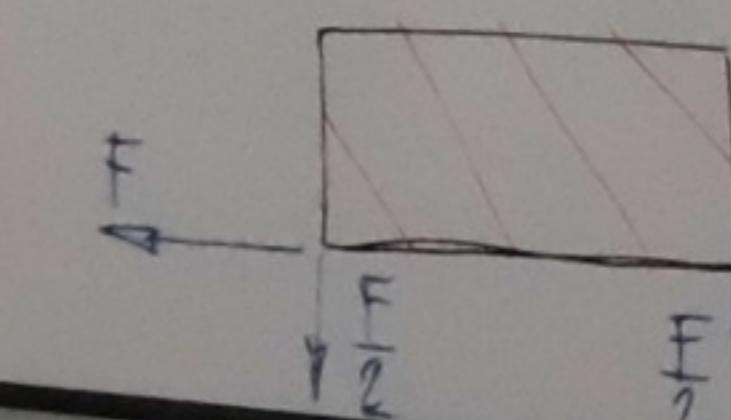
- Anello chiuso statica ABC, con le corniere intese non allineate.
- Arco estrema - carrello avente una corniera intese non allineate.



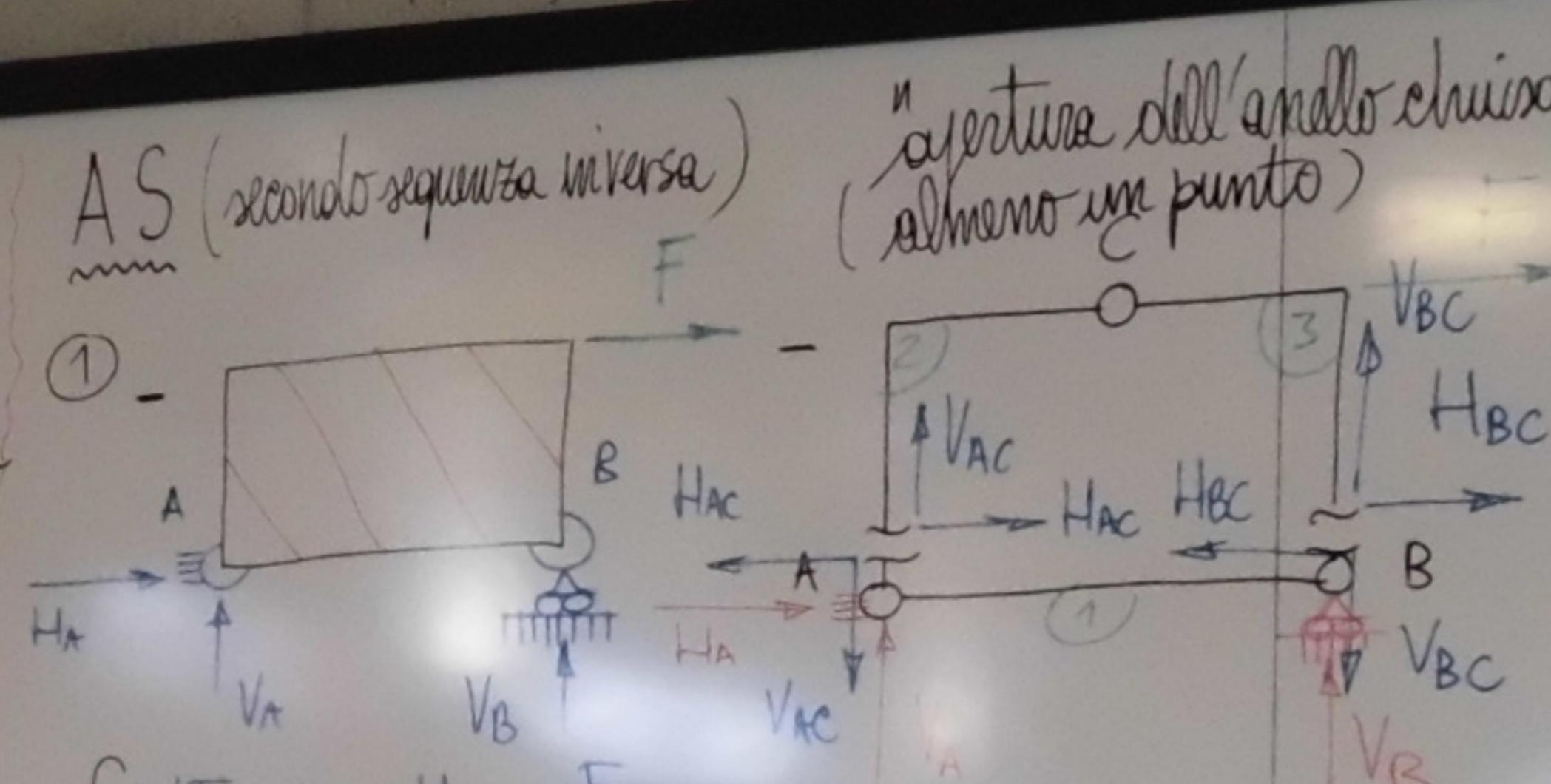
Arco a tre corniere
non allineate

$$\begin{aligned} \text{Eq cardini della statica (piane)} \\ \sum F_x = 0 \Rightarrow H_A = -F \\ \sum M_A = 0 \Rightarrow V_B = \frac{F}{2} \\ \sum M_B = 0 \Rightarrow V_A = -\frac{F}{2} \end{aligned}$$

$$(\sum F_y = 0 \Rightarrow V_A + V_B = 0)$$



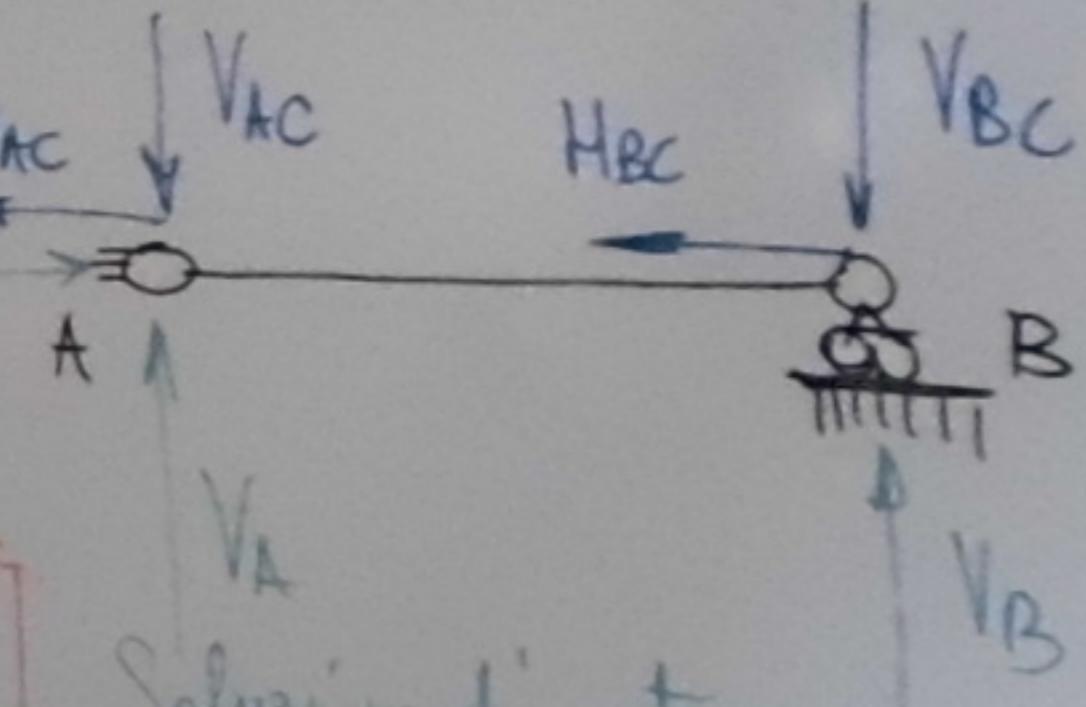
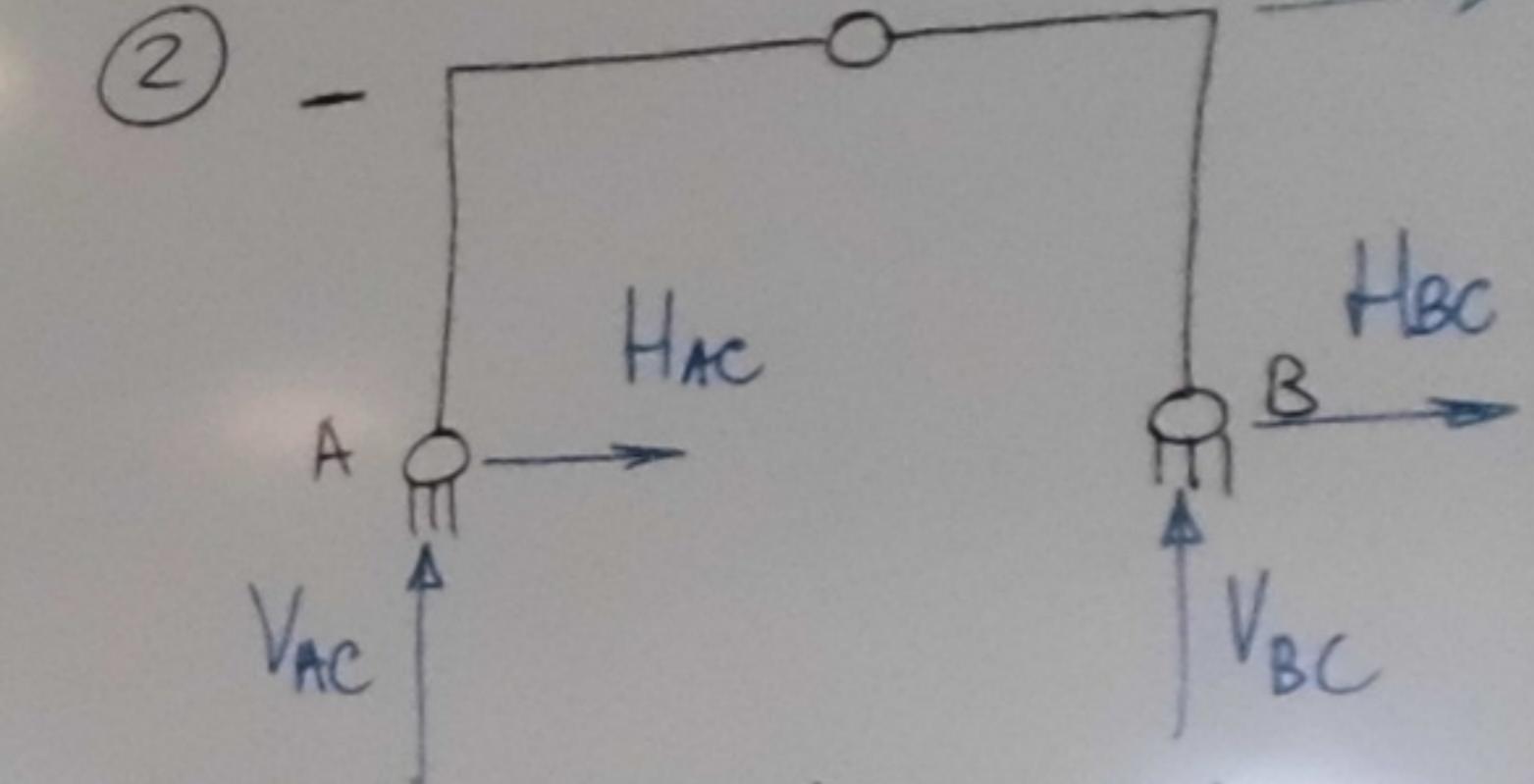
AS (seconda sequenza inversa)



Ciò conduce alla risoluz.
di arco a tre corniere

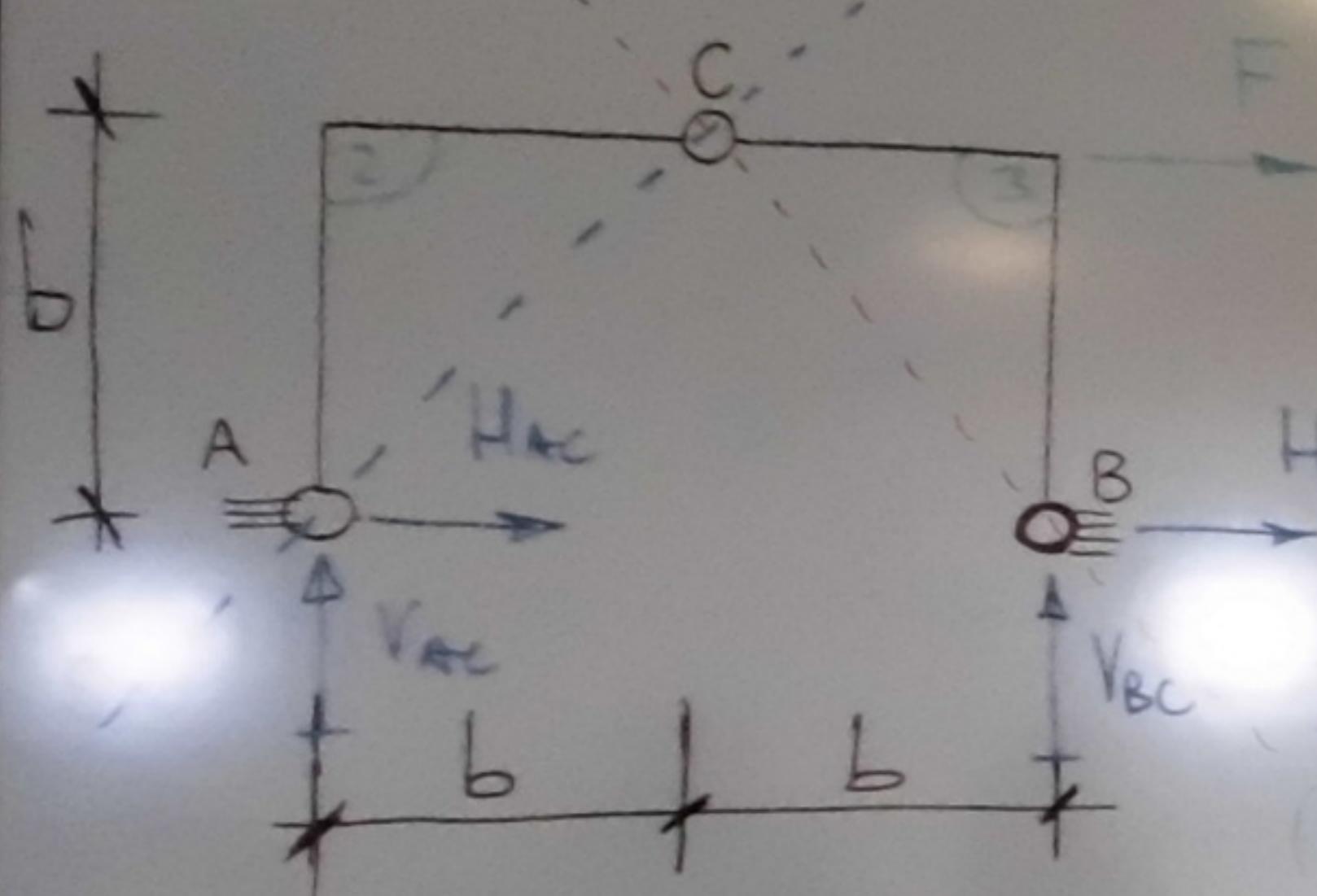
non allineate (ABC)

Schemi ad albero (senza maglie chiuse)



Soluzione di arco a tre
corniere non allineate

Calcolo RV, sistemi articolati



Soluzione di arco a tre
cerniere non allineate
(4 comp. inc. di RV)

Sistema di 4 eq. in 4 incognite
(dinceppato)

Eq di equil. (assoluto e relativo)

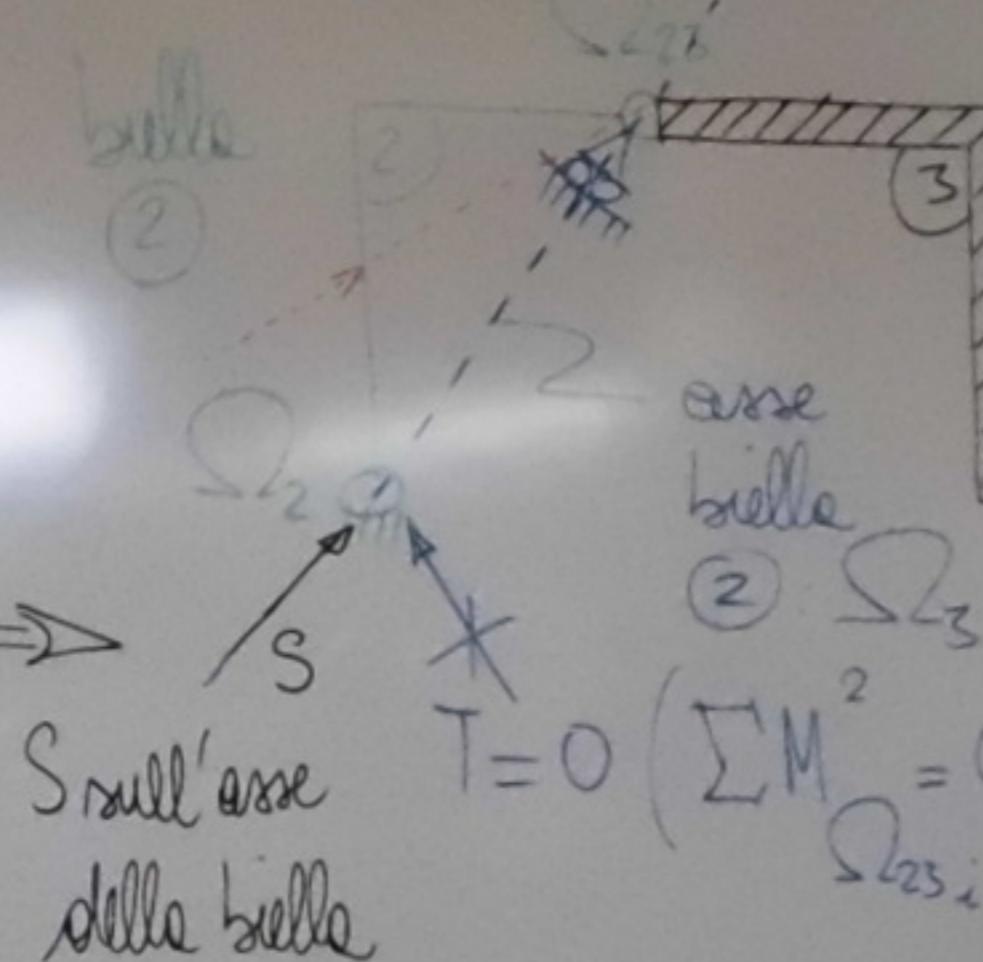
$$\sum M_{B_i} = 0 \Rightarrow V_{AC} = -\frac{F}{2} \quad (1)$$

$$\sum M_{A_i} = 0 \Rightarrow V_{BC} = \frac{F}{2}$$

$$\sum M_{C_i} = 0 \Rightarrow H_{AC} = V_{AC} \leftarrow \begin{matrix} \text{Eq di equil.} \\ \text{relativo} \\ \text{alla rotazione} \\ \text{tra 2 e 3} \end{matrix}$$

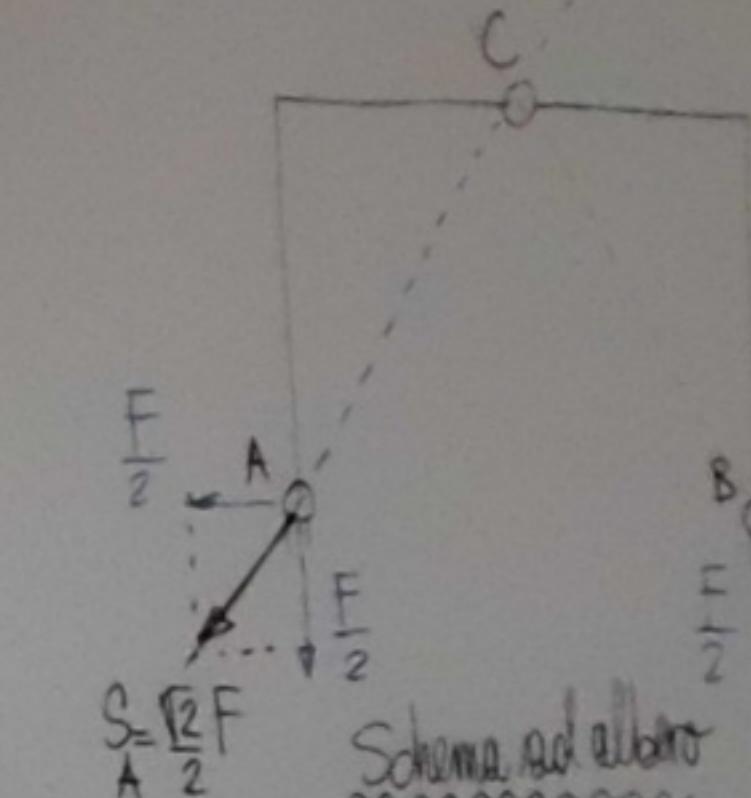
$$\sum M_{C_i} = 0 \Rightarrow H_{BC} = -V_{BC} \quad = -\frac{F}{2}$$

Ruolo statico della biella (asse anche
appoggio lunghezza) \rightarrow biella statica

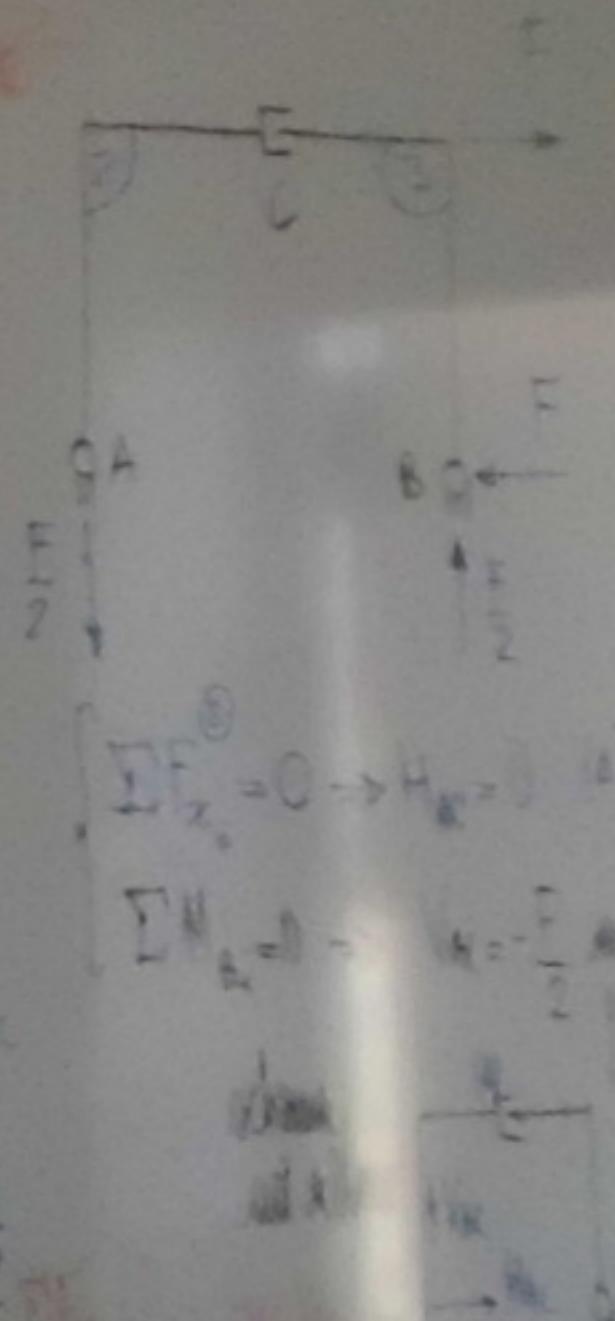


$$S \text{ sull'asse delle bielle} \quad T=0 \quad (\sum M^2 = 0)$$

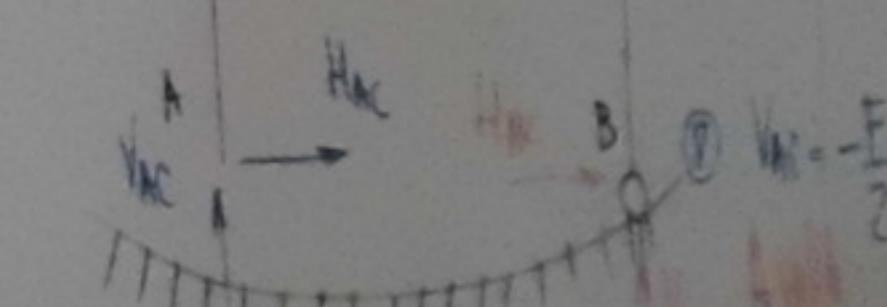
RV finali



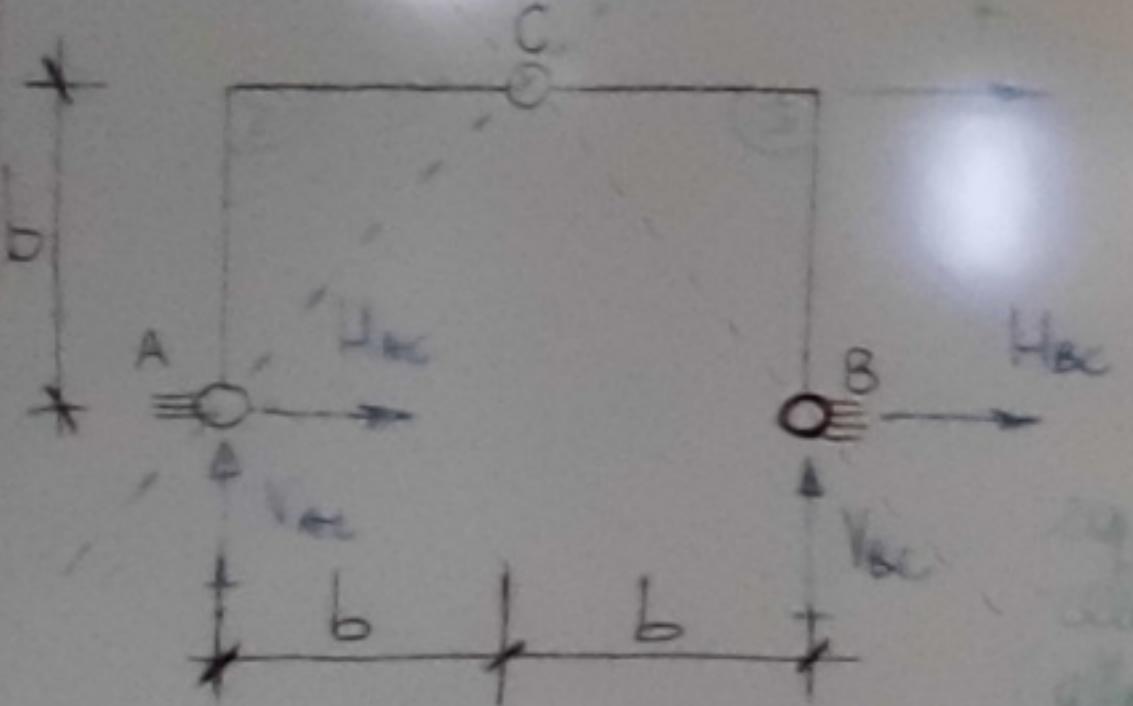
Vant:



(N.B.: Fortunatamente, in questa condizione di
cerchio, anche la biella 3 gioca un ruolo statico
con S sull'asse delle bielle)



Calcolo RV, sistemi articolati



Soluzione di arco a tre
corner non allineate

(4 comp. ind. di RV)

Eq di equil (assoluto e relativo)

$$\sum M_{B_i}^{(2)(3)} = 0 \Rightarrow V_{AC} = -\frac{F}{2} \quad (1)$$

$$\sum M_{A_i}^{(2)} = 0 \Rightarrow V_{BC} = \frac{F}{2}$$

$$\sum F_{y_i} = 0 \quad \checkmark$$

$$\sum M_{C_i}^{(2)} = 0 \Rightarrow H_{AC} = V_{AC} = -\frac{F}{2}$$

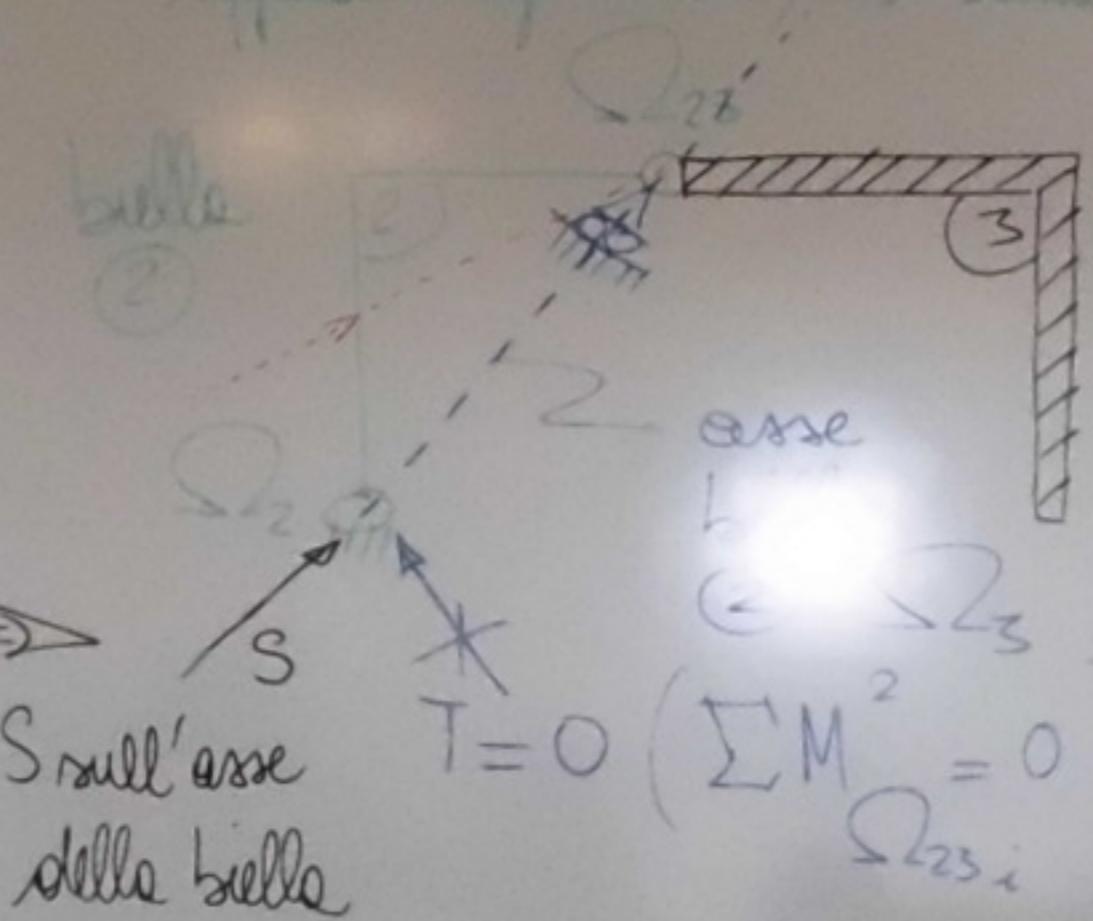
$$\sum M_{C_i}^{(3)} = 0 \Rightarrow H_{BC} = -V_{BC} = -\frac{F}{2}$$

Sistema di 4 eq. m in 4 incognite
(decouplato)

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

(N.B.: Fortunatamente, per questa condizione di
corner, anche la biella 3 gioca un ruolo statico
con S sull'asse delle bille.)

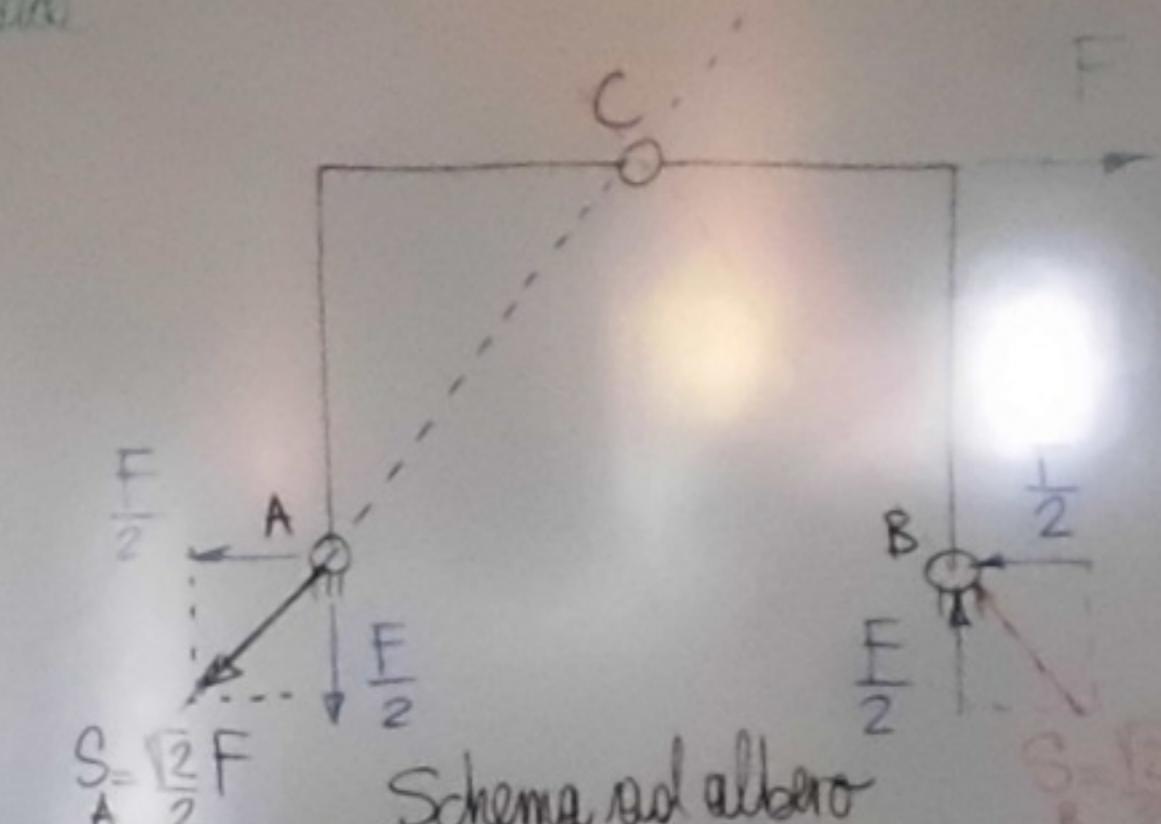
Ruolo statico delle bille (sia orario
affatto lungo di ora) \Rightarrow bille "statiche"



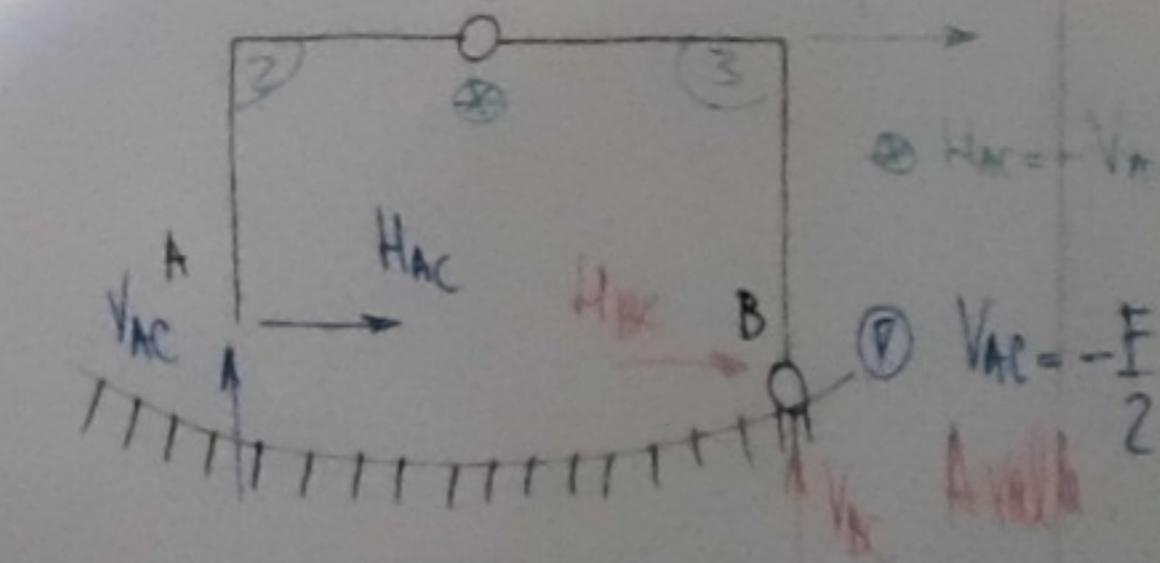
Sull'asse
delle bille

$$T=0 \quad (\sum M_{Q_23}^{(2)} = 0)$$

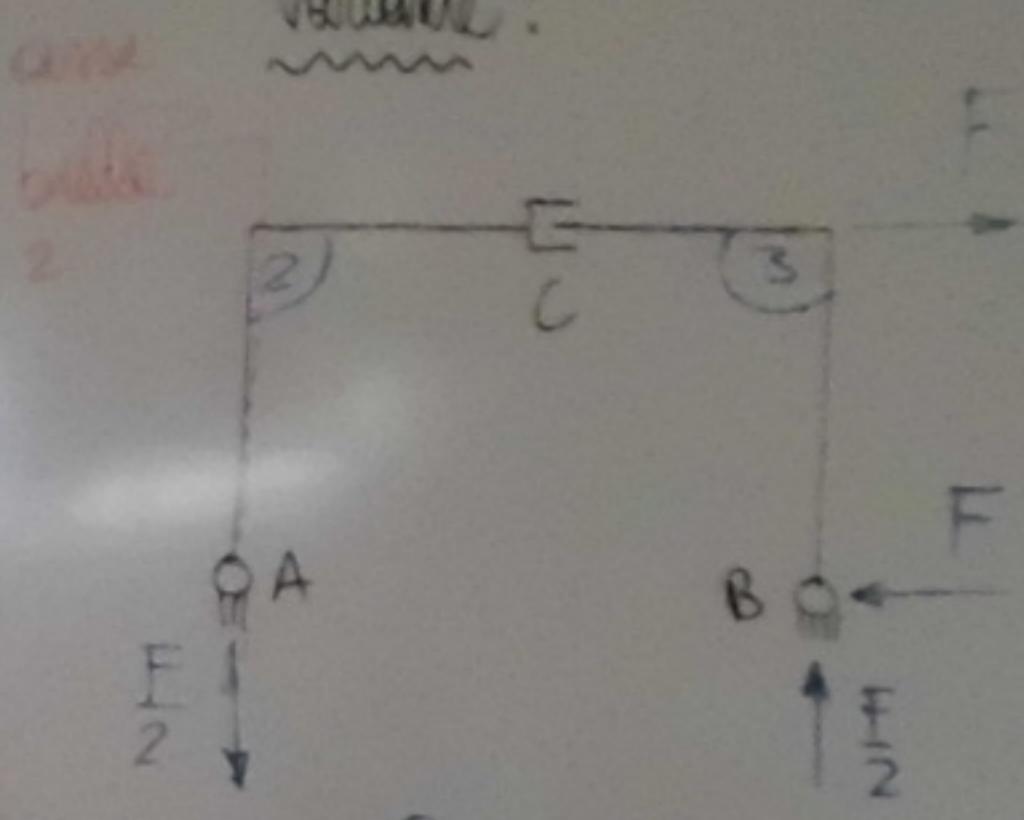
RV finali



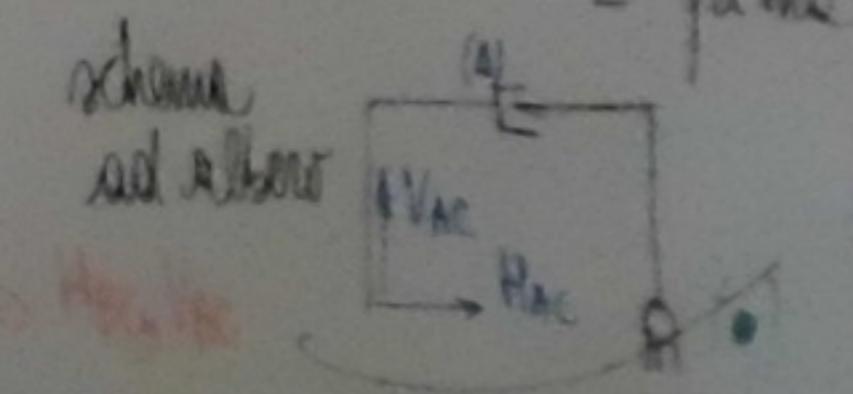
Schema ad albero



Variante:



$$\begin{cases} \sum F_{x_i}^{(2)} = 0 \Rightarrow H_{AC} = 0 \quad (2) \\ \sum M_{B_i}^{(2)} = 0 \Rightarrow V_{AC} = -\frac{F}{2} \end{cases}$$



Calcolo sistematico

$$\sum F_x = 0 \Rightarrow V_{AC} = -\frac{F}{2}$$

$$\sum F_y = 0 \Rightarrow S = \frac{\sqrt{2}}{2} F$$

$$\sum M_C = 0 \Rightarrow H_{AC} = -V_{BC}$$

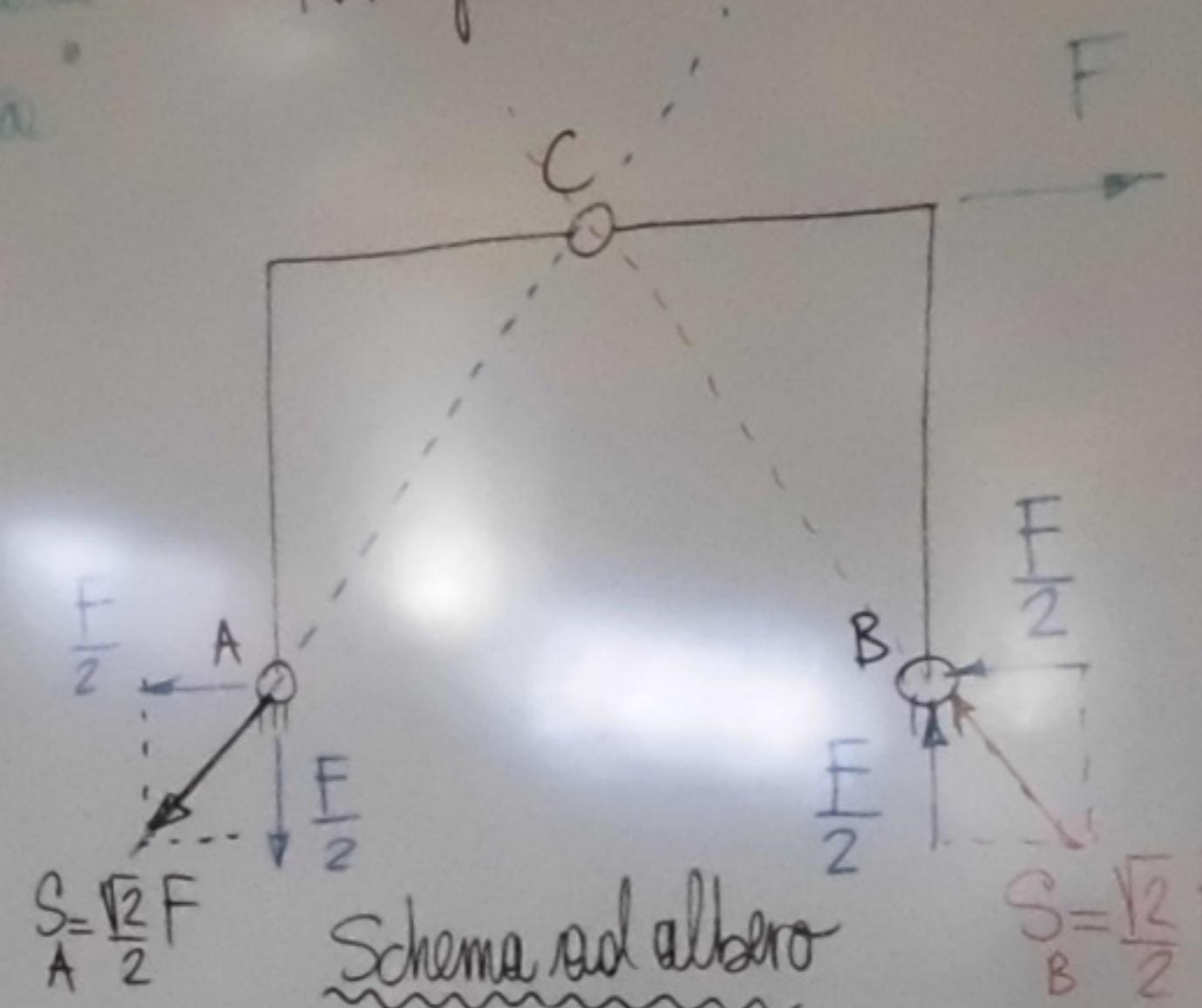
$$S = \frac{\sqrt{2}}{2} F$$

Rullo statico della biella (non ruota)
Rullo statico della biella (non ruota) \rightarrow biella statica

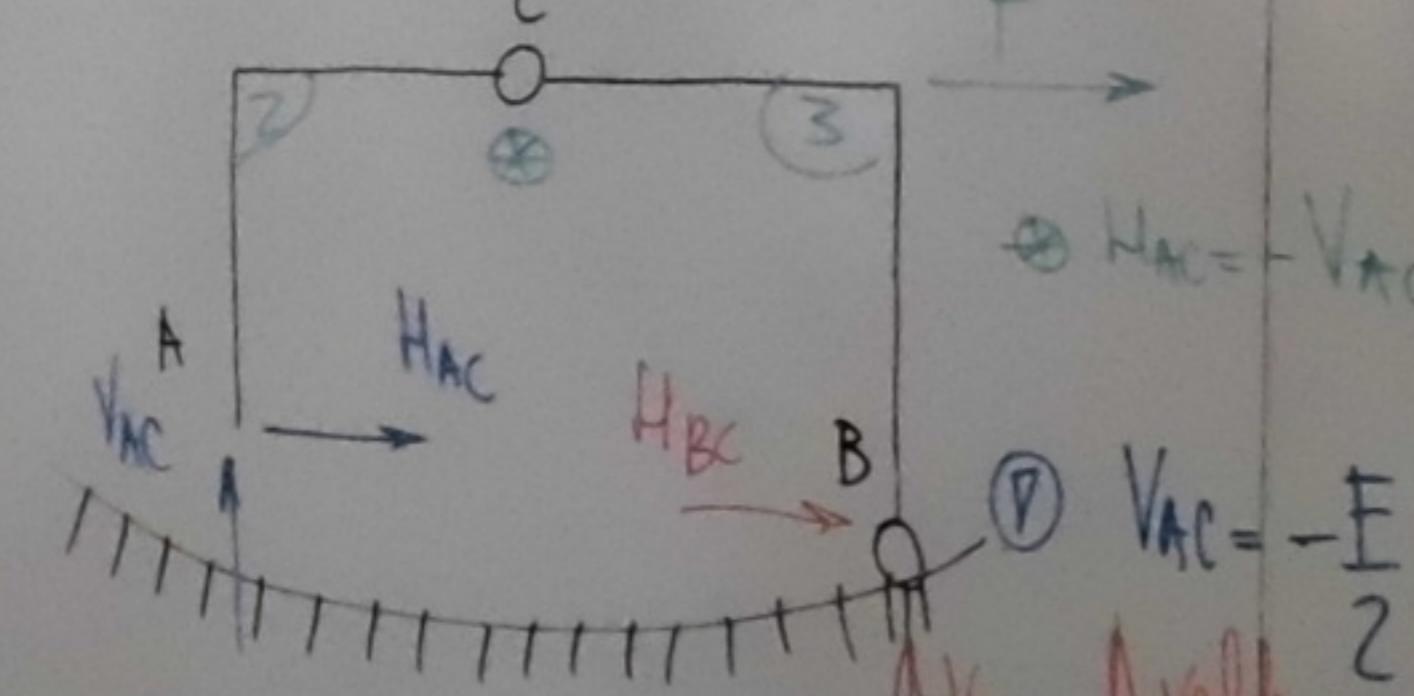
$$S \text{ sull'asse delle bille} \quad T=0 \quad (\sum M^2 = 0)$$

(B: Fattorianti, per parte A e B: zone di
azione, anche la biella 3 gioca un ruolo statico
per S sull'asse delle bille)

RV finali



Schema ad albero



$$H_{AC} = -V_{AC}$$

$$V_{AC} = -\frac{F}{2}$$

$$V_{BC} = -\frac{F}{2}$$

Varianti:

asse
bille
2

$$E \downarrow$$

$$\left\{ \begin{array}{l} \sum F_{x_i}^{(2)} = 0 \Rightarrow H_{AC} = 0 \quad (A) \\ \sum M_{B_i} = 0 \Rightarrow V_{AC} = -\frac{F}{2} \end{array} \right.$$

$$V_{AC} = -\frac{F}{2} \text{ come prima}$$

