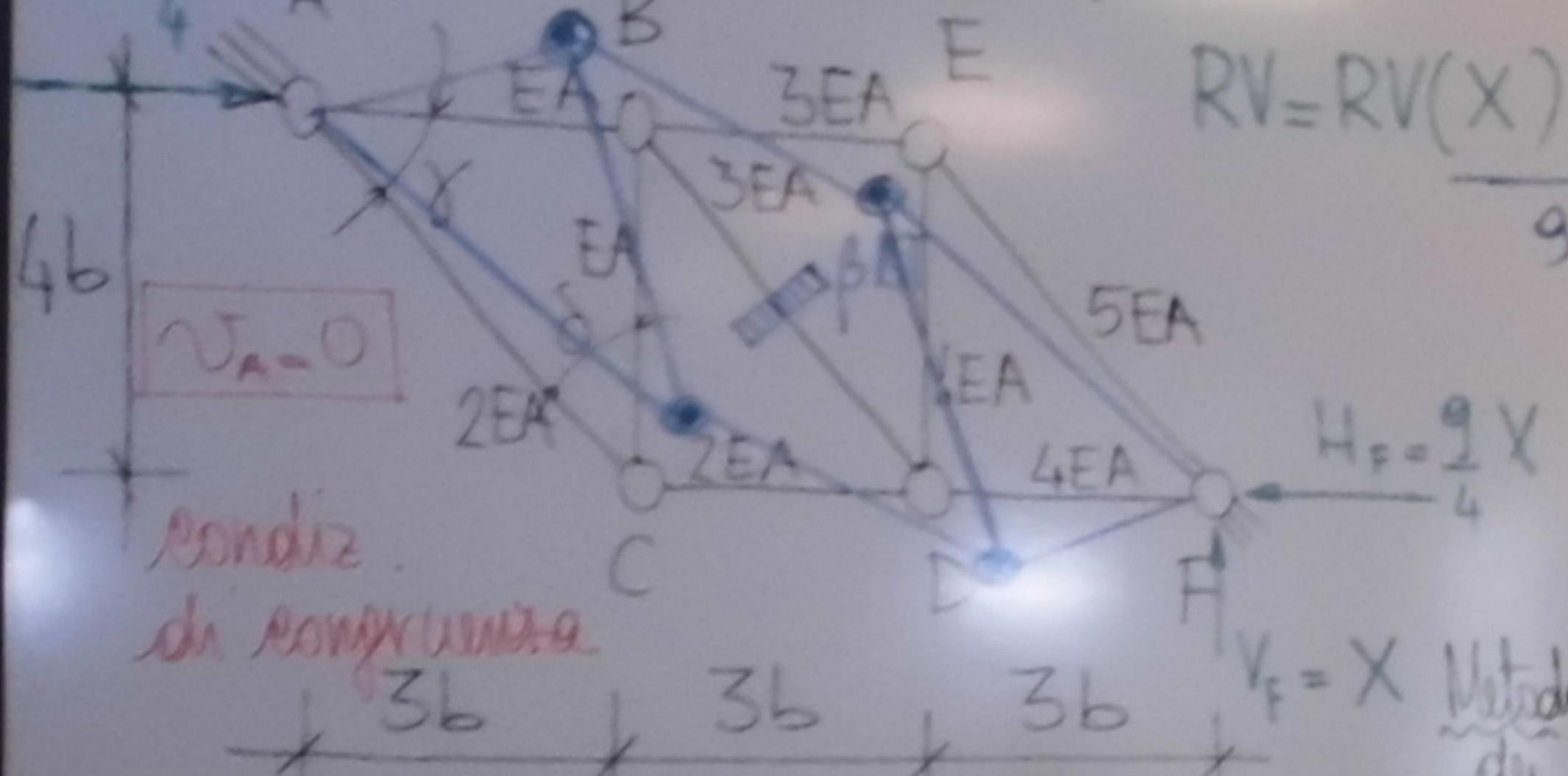


Trav. reticolare iperstatica

$$H_A = \frac{q}{4\pi} \times \frac{1}{A} V_A = X \left( \text{sulla doppia inc. e per +, -} \right)$$



$$l_{AC} = 5 \text{ b } \text{Sistema B} \text{ } l=0, I=1=l+v \cdot l$$

$$\sin Y = \frac{4}{5} \quad \sin \delta = \frac{3}{5} \quad a + y = 9 + 4 = 13 > 2n = 2 \cdot 6 = 12$$

$$\cos Y = \frac{3}{5}, \text{ WSD} = \frac{4}{5}$$

$$\tan Y = \frac{1}{3}, \tan S = \frac{3}{4}$$

interpretativa (una volta)  
Utilizzo di un metodo volta e  
particolare la determinazione delle PEV  
e -angula, con i V di confronto / PV

Stutterea littoralis (Sideroxylon) A

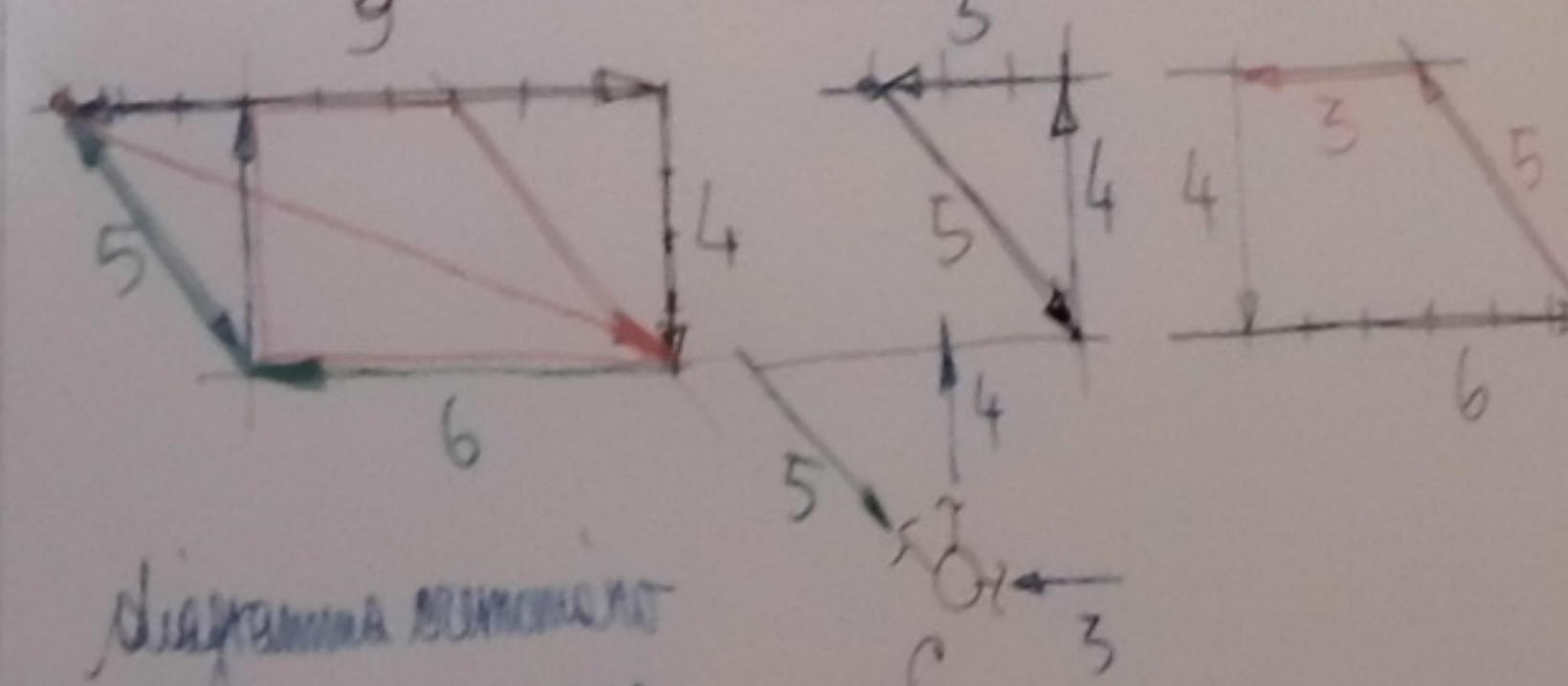
$$X=1 \Rightarrow N' = N/4$$

$$= 4^2 \rightarrow N^* = 4N$$

Node A

## Nodo C

Nedo B



*Dianthus barbatus*

Patrolo da Marca (Pitter)

$$\sum F_y = 0 \Rightarrow N_x = 4$$

$$x+y=0 \Rightarrow N_K = 4$$

$$\sum M_B = 0 \Rightarrow N_B = -$$

Satellite of PLV(PFV) N

$$d_L = \frac{1}{2} (\nabla_A) = \int N [E + XN] ds + \int N \Sigma ds$$

$$= \sum N_i N_{i+1} + X \sum N_i^2 + N_i N_{i+1}$$

$$X = - \frac{\sum \frac{M_i l_i}{EA_i} + N_i M_i S_i}{\sum \frac{l_i}{EA_i}} = 3.07 EA \rightarrow 1.1$$

Trazi reticolari ipostatiche

Struttura fittizia (Sistema A)

$$X=1 \Rightarrow N_i = N_a \frac{1}{4}$$

$$= 4 \Rightarrow N_i = 4N_a$$

$$N_i = N_{0,i} + XN_c$$

$$\text{risultato} = \frac{1}{4} X N_c$$

Metodo delle sezioni (Ritter)

$$\begin{cases} \sum F_y^{SN} = 0 \Rightarrow N_{BC}^+ = 4 \\ \sum M_{B_{SN}}^+ = 0 \Rightarrow N_{AB}^- = -3 \\ \sum M_C^+ = 0 \Rightarrow N_{AB}^- = -6 \end{cases}$$

Calcolo di spostamenti nodali (PLV)

Struttura del PLV

$$1 v_E = \sum N_i \frac{N_{0,i} + XN_c l_i}{EA_i} + \sum N_i \frac{\varepsilon_t l_i}{EA_i} - \sum N_i \frac{XN_c l_i}{EA_i} = -\frac{3}{2} \alpha BDT b$$

$$v_D = ? \quad v_E = v_D + \Delta_{ED,E}$$

$$v_D = v_E - \frac{N_{ED} l_{ED}}{E A_{ED}} = -\frac{39}{22} \alpha BDT b$$

Struttura equilibrata

Risolvendo i getti ad X:

$$X = -\frac{\sum N_i N_{0,i} l_i + N \sum N_i^2 l_i + N \alpha BDT b}{\sum N_i^2 l_i} = \frac{3 \alpha BDT EA}{11} \Rightarrow N_i = X N_i^2$$

Deformente elastica

$$v_B = \Delta_{BD,B} - \frac{N_{BD} l_{BD}}{E A_{BD}}$$

Struttura incisa  
 $X=1 \rightarrow N = N^* / 4$   
 $\sum F_y = 0 \rightarrow N_{KC} = 4$   
 $\sum M_C = 0 \rightarrow N_{AB} = -6$   
 $N_i = N_o + XN^*$   
 $N_{AB} = XN^*$

Metodo delle sezioni (Ritter)  
 $\sum F_y = 0 \rightarrow N_{KC} = 4$   
 $\sum M_B = 0 \rightarrow N_{AB} = -3$   
 $\sum M_C = 0 \rightarrow N_{AB} = -6$

Sottrazione del PLV (PFV)  
 $\alpha_x = 1 (\gamma_A) = \int \frac{N}{EA} dx + \int \frac{\epsilon_t}{\epsilon_t} ds$   
 $\text{dove } \epsilon_t = 2BDt ds$   
 $= \sum \frac{N_i N_{oi} l_i}{EA_i} + X \sum \frac{N_i l_i}{EA_i} + N \frac{\beta D t l}{BD}$   
 Residendo rispetto ad  $X$ :  
 $X = - \frac{\sum \frac{N_i N_{oi} l_i}{EA_i} + N \frac{\beta D t l}{BD}}{\sum \frac{N_i^2 l_i}{EA_i}}$

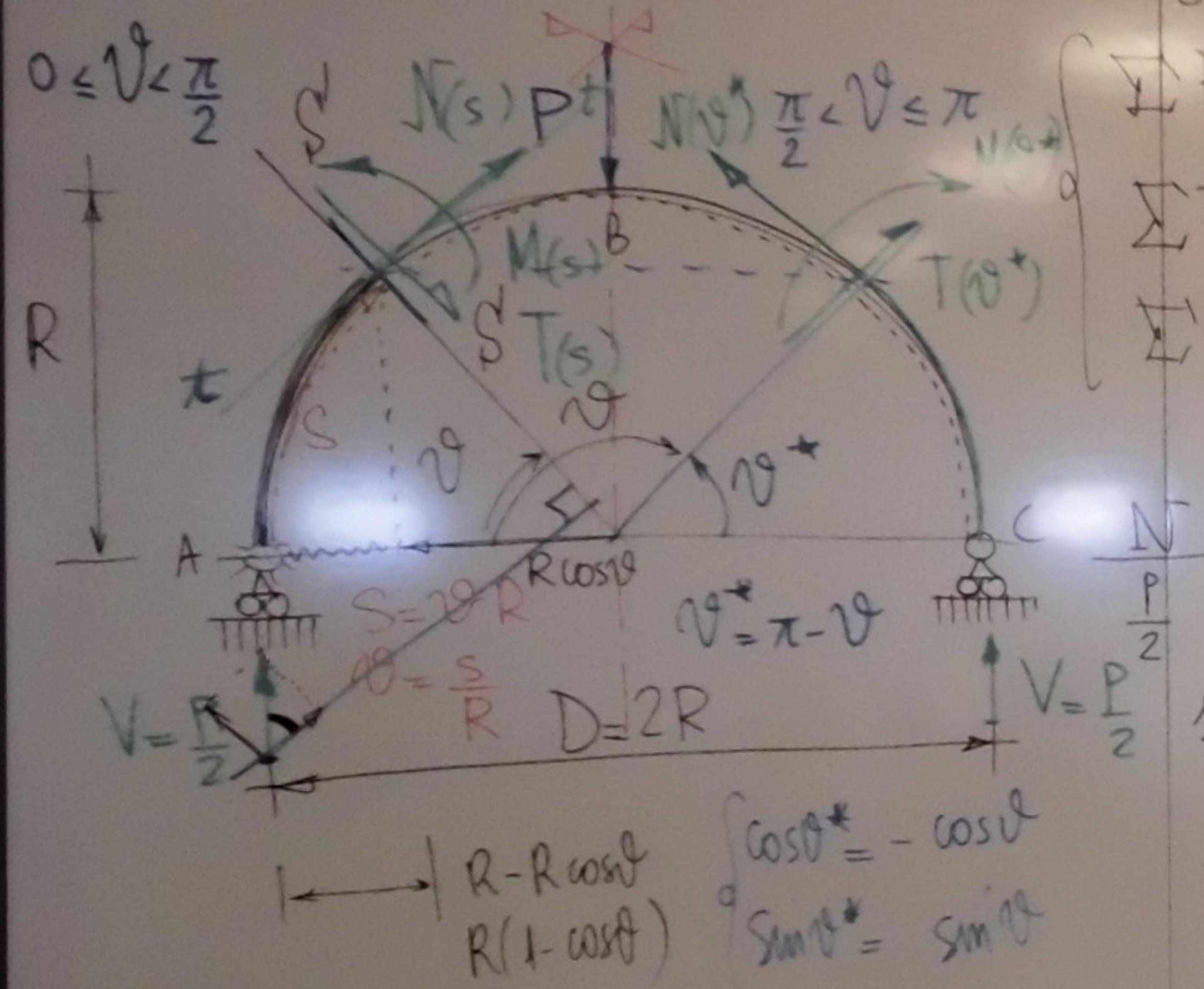
Calcolo di spostamenti nodali (PLV)  
 $v_E = ?$

Sottrazione del PLV:  
 $v_E = \sum_i \frac{N_i N_{oi} l_i + X N_i l_i}{EA_i} + \sum_i N_i \epsilon_{ti} l_i$   
 $= \sum_i \frac{N_i X N_i l_i}{EA_i}$   
 $= -\frac{3}{2} \alpha \beta D t b$

$v_D = ?$  (PLV), oppure  $v_E = v_D + \Delta l_{ED}$   
 $v_D = v_E - \frac{N_{ED} \Delta l_{ED}}{EA_{ED}} = -\frac{39}{22} \alpha \beta D t \beta$

Deformata elastica  
 $u_B = \Delta l_{AB} = \frac{N_{AB} l_{AB}}{EA_{AB}}$

## Azioni interne in este curve (circolari)



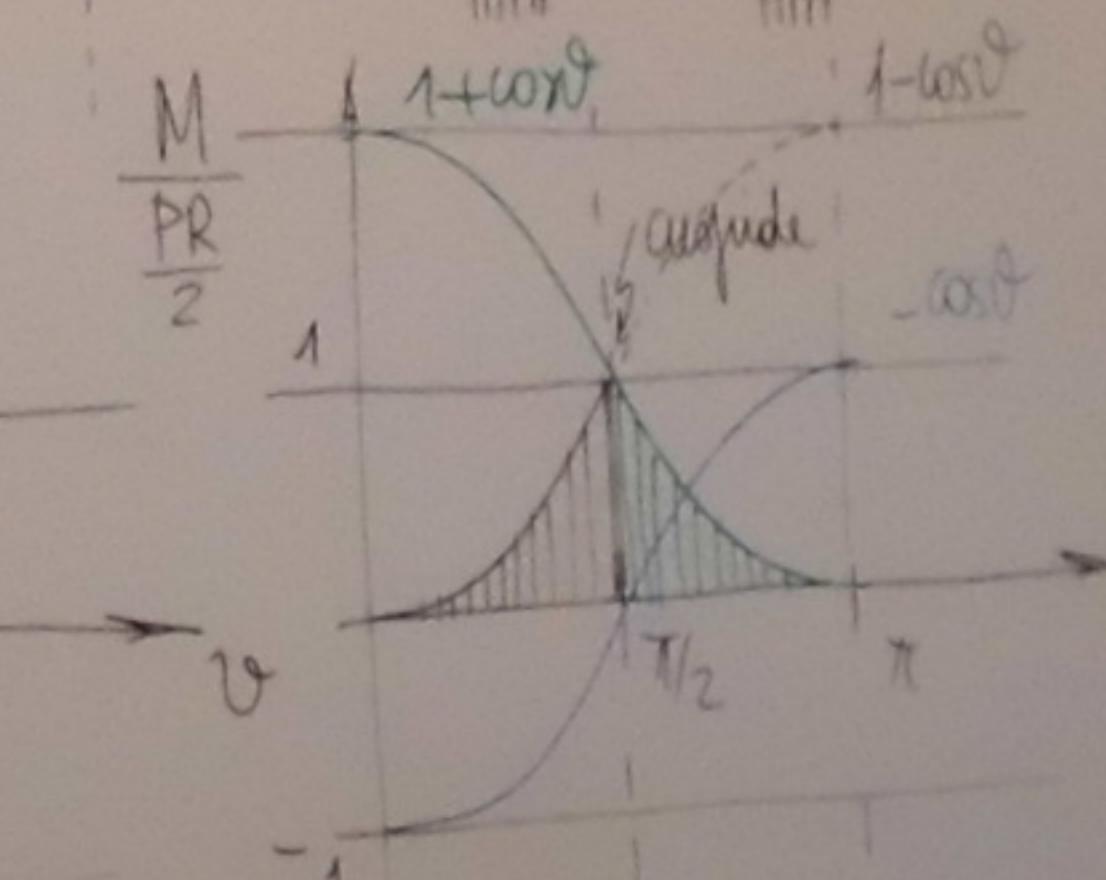
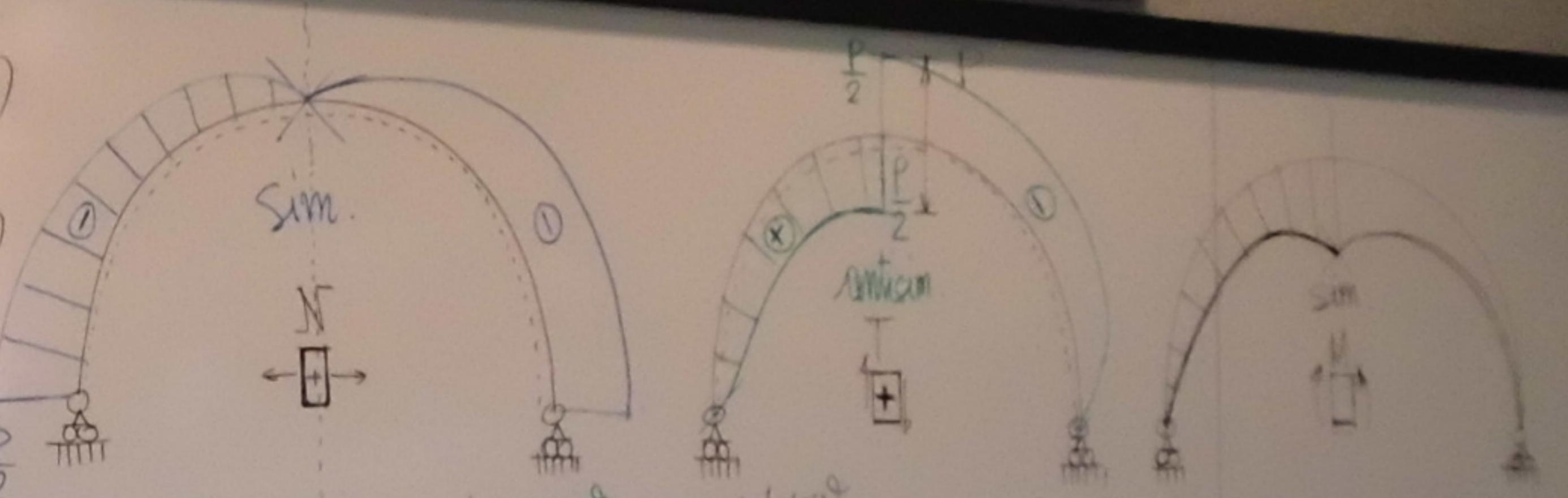
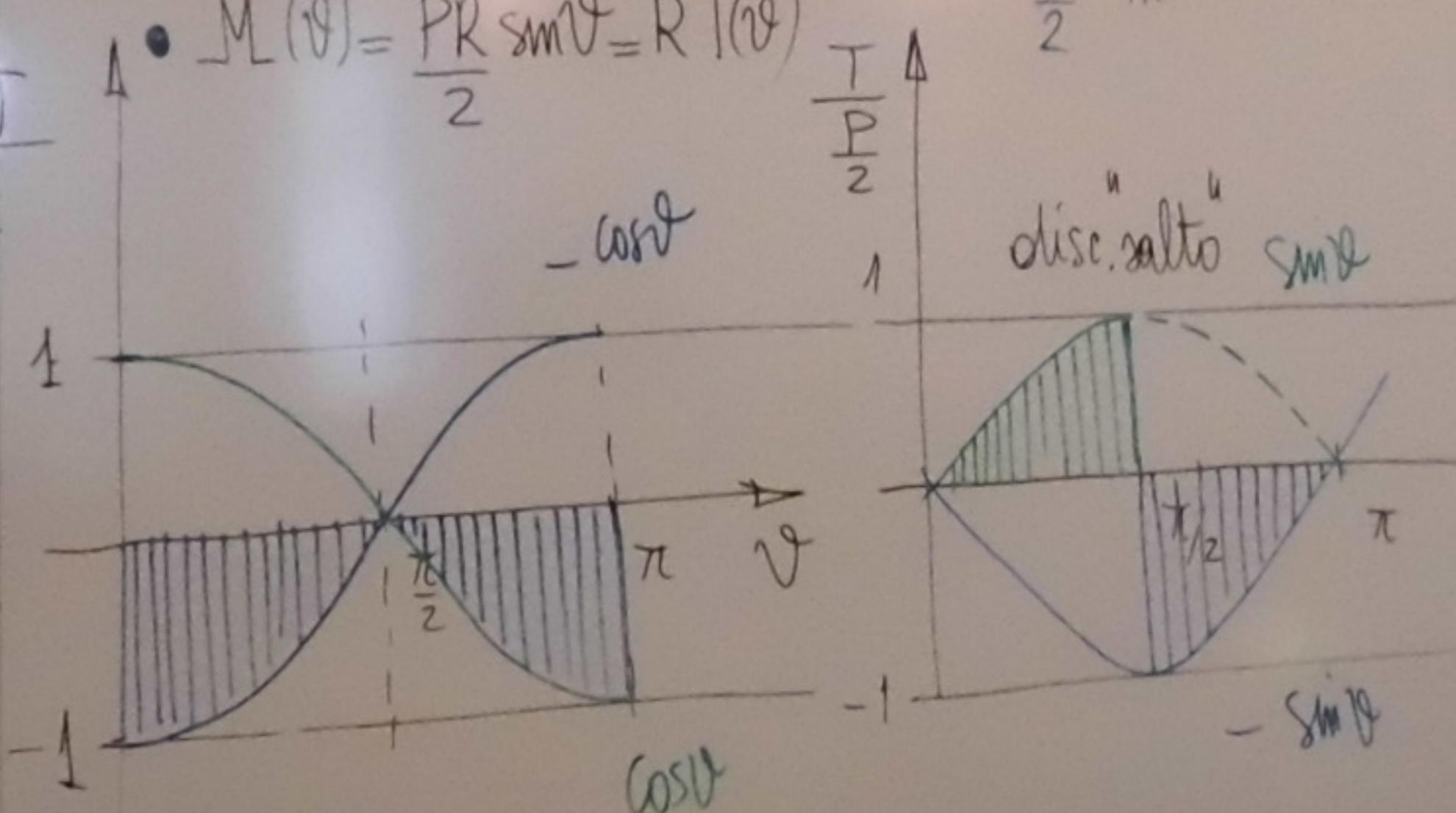
$$\text{Equil.} \quad AI = AI(\theta)$$

$$\sum F_t = 0 \Rightarrow N(s) = -\frac{P}{2} \cos \theta; \quad N(\theta) = T(\theta)$$

$$\sum F_n = 0 \Rightarrow T(s) = \frac{P}{2} \sin \theta; \quad T(\theta) = -N(\theta)$$

$$\sum M_g = 0 \Rightarrow M(s) = \frac{PR}{2} (1 - \cos \theta)$$

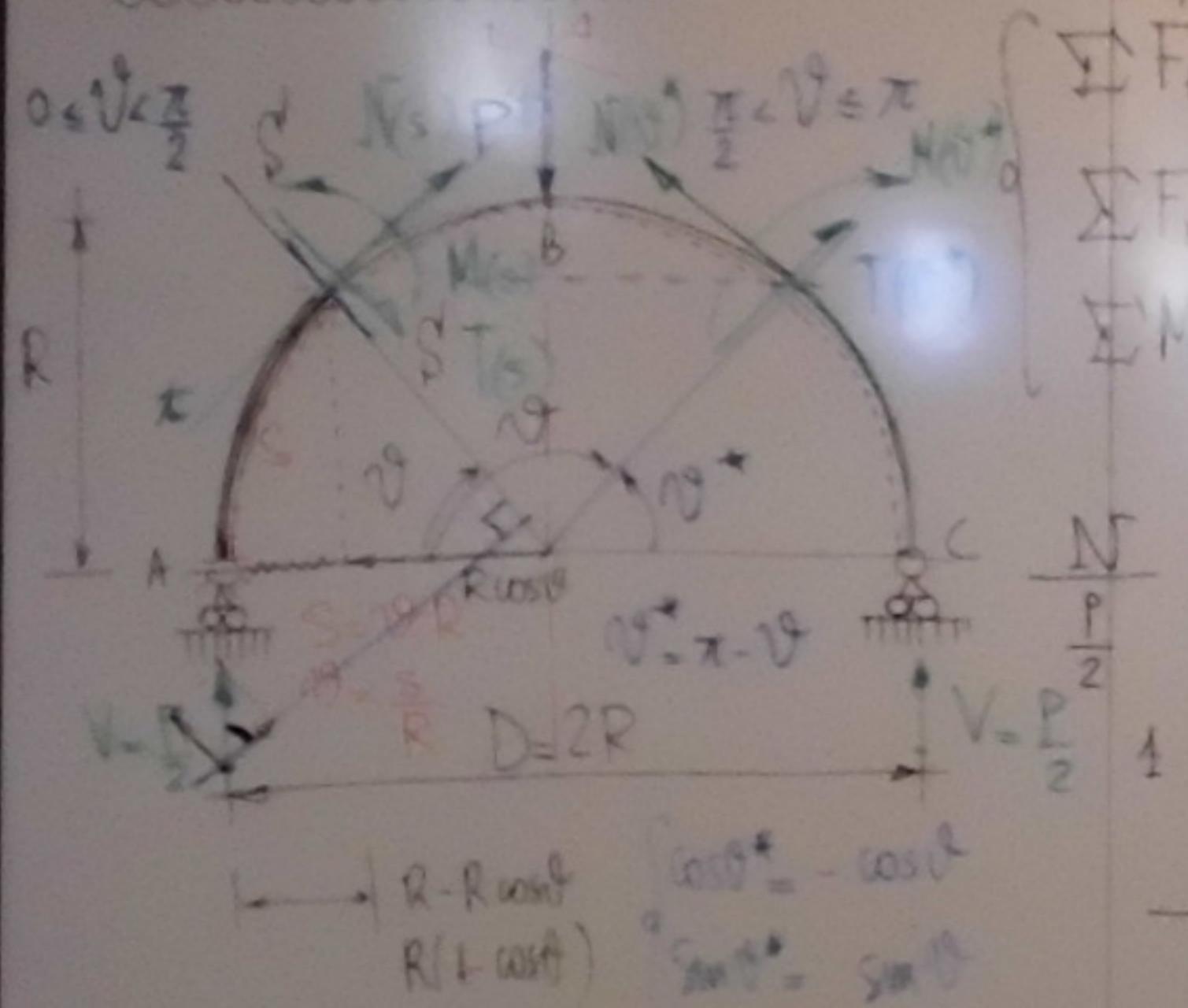
$$M(\theta) = \frac{PR}{2} \sin \theta = RT(\theta)$$



$$\begin{aligned} N(\theta) &= -\frac{P}{2} \cos \theta = \frac{P}{2} \cos \theta \\ T(\theta) &= -\frac{P}{2} \sin \theta = \frac{P}{2} \sin \theta \\ M(\theta) &= \frac{PR}{2} (1 - \cos \theta) = \frac{P}{2} (1 - \cos \theta) \end{aligned}$$



Azioni interne su una curva (arco)



$$\text{Equal } AI = AI(\theta)$$

$$\sum F_t^{\text{su}} = 0 \Rightarrow N(s) = -\frac{P}{2} \cos \theta ; \quad N(\theta) = T(\theta)$$

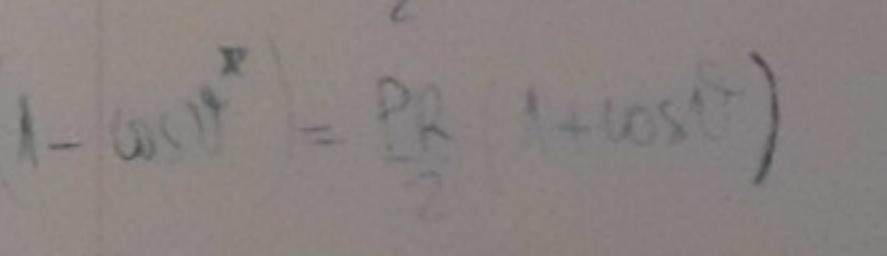
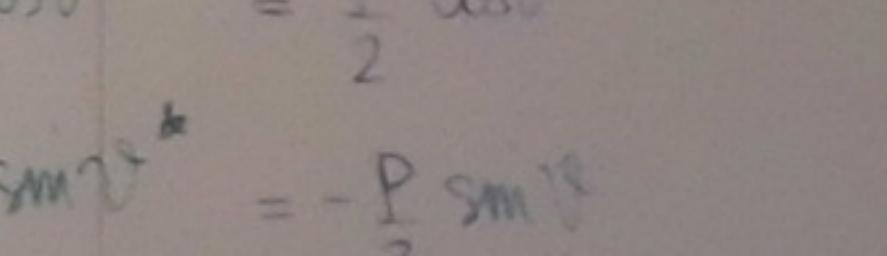
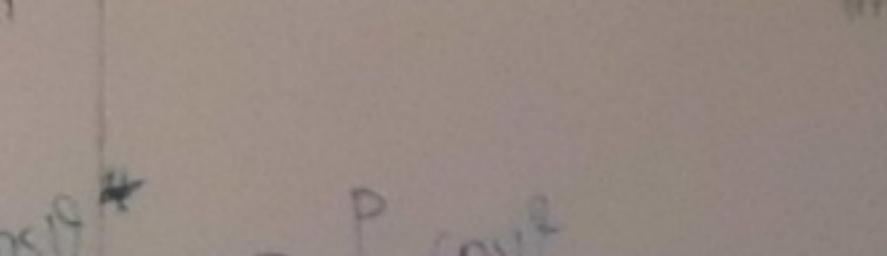
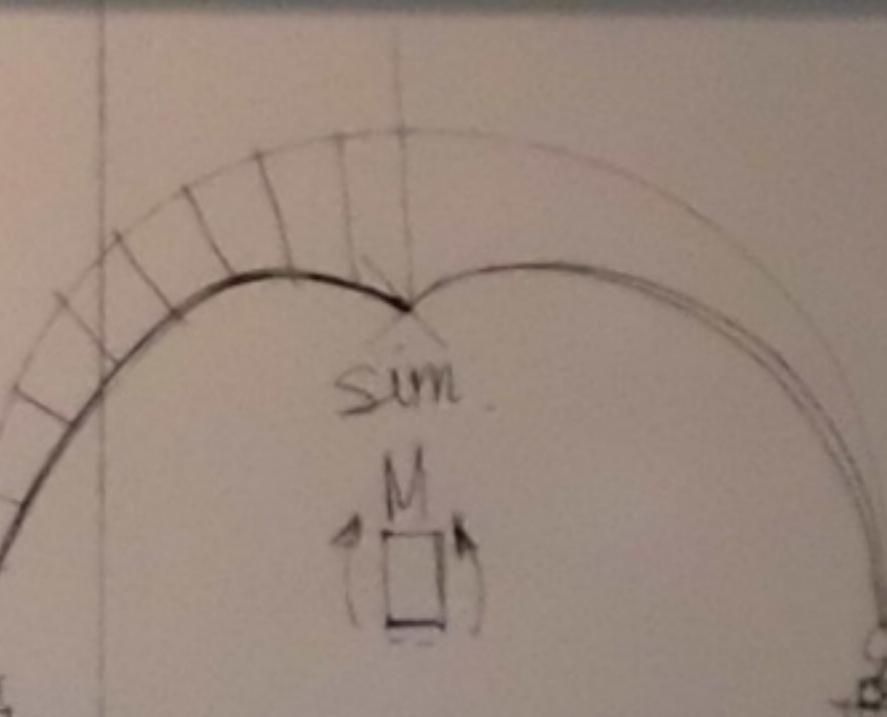
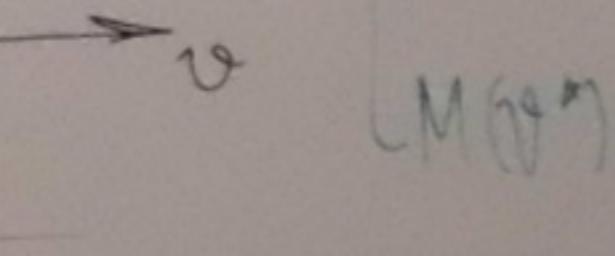
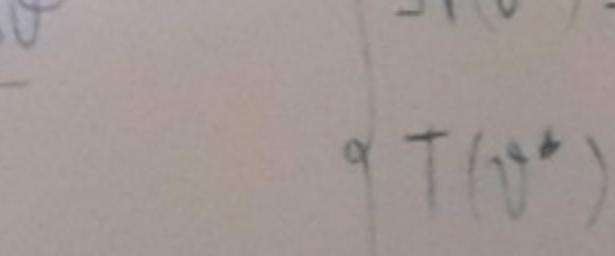
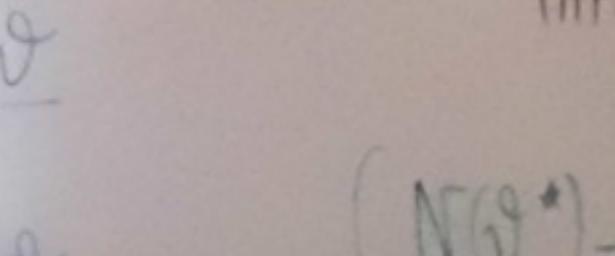
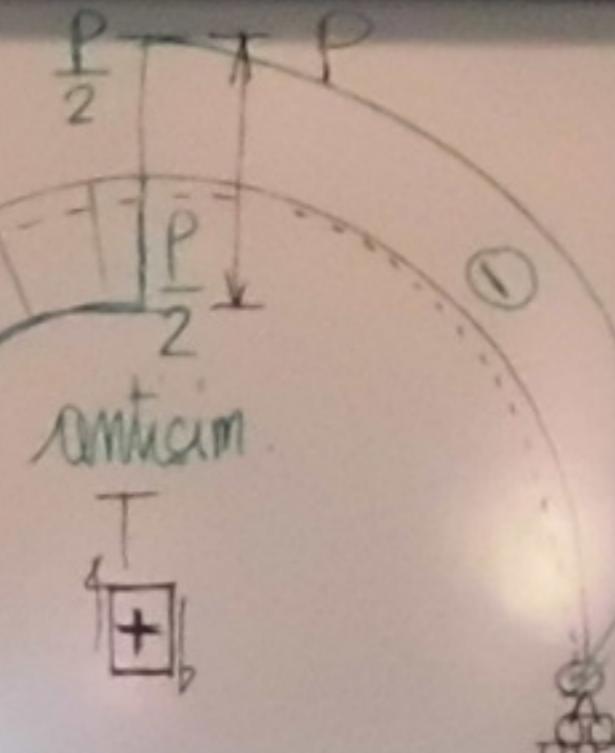
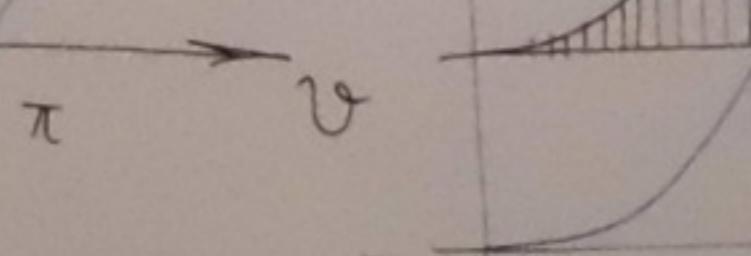
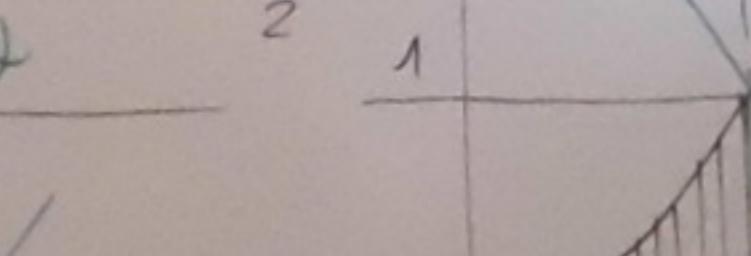
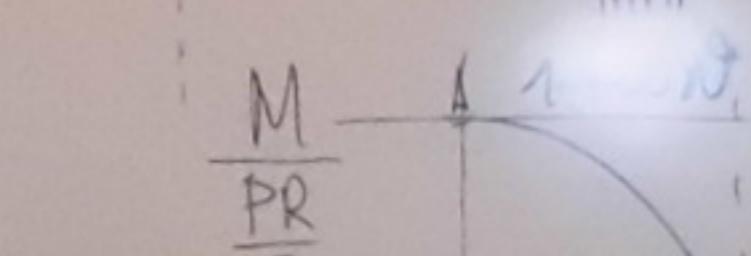
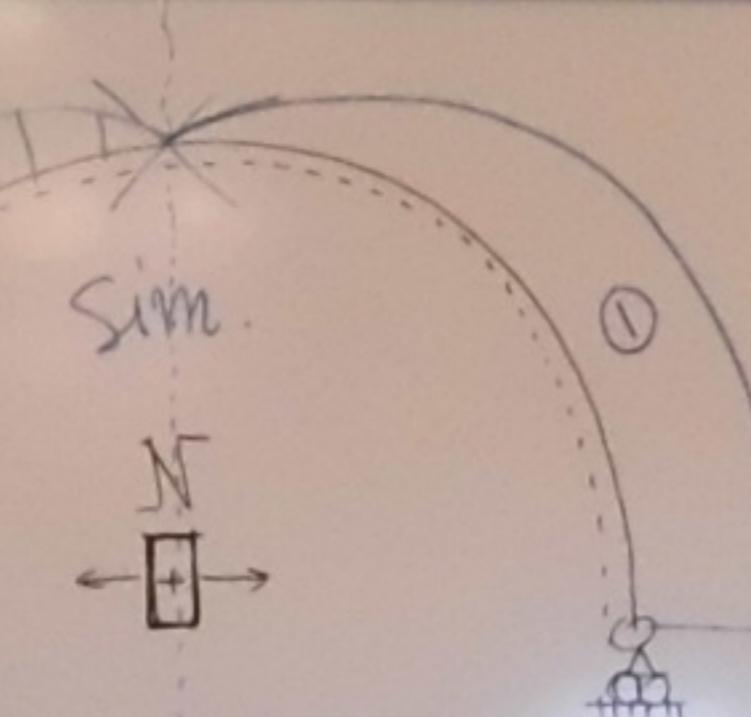
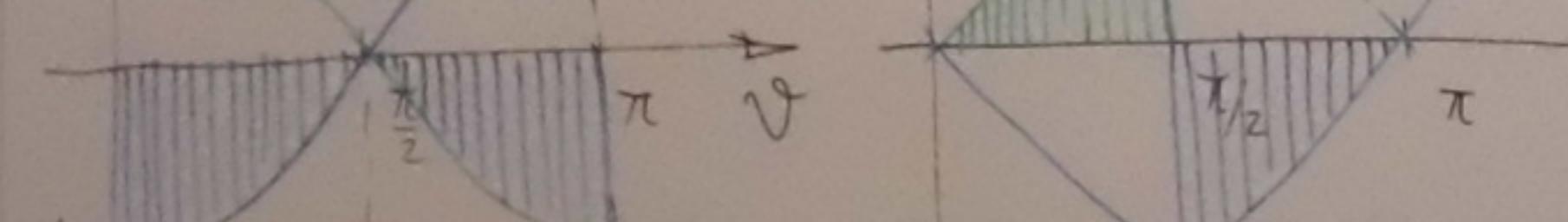
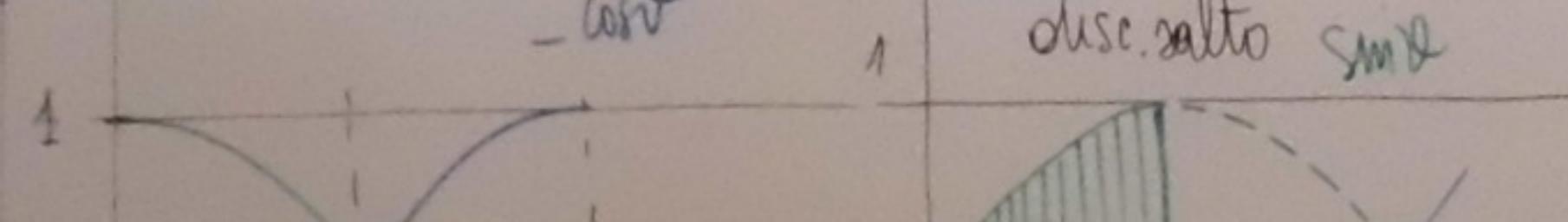
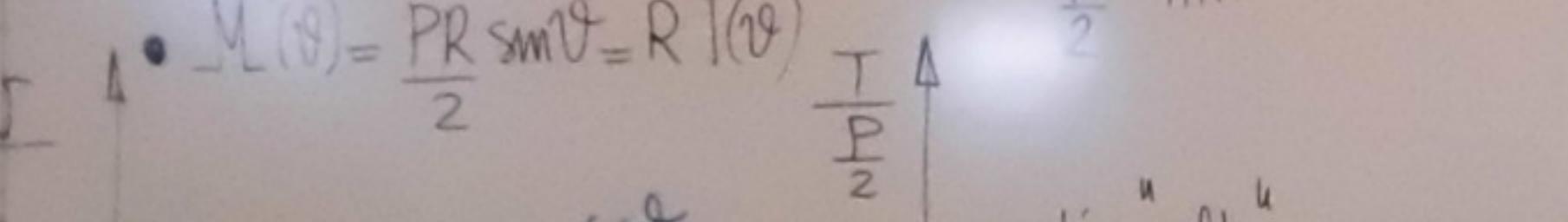
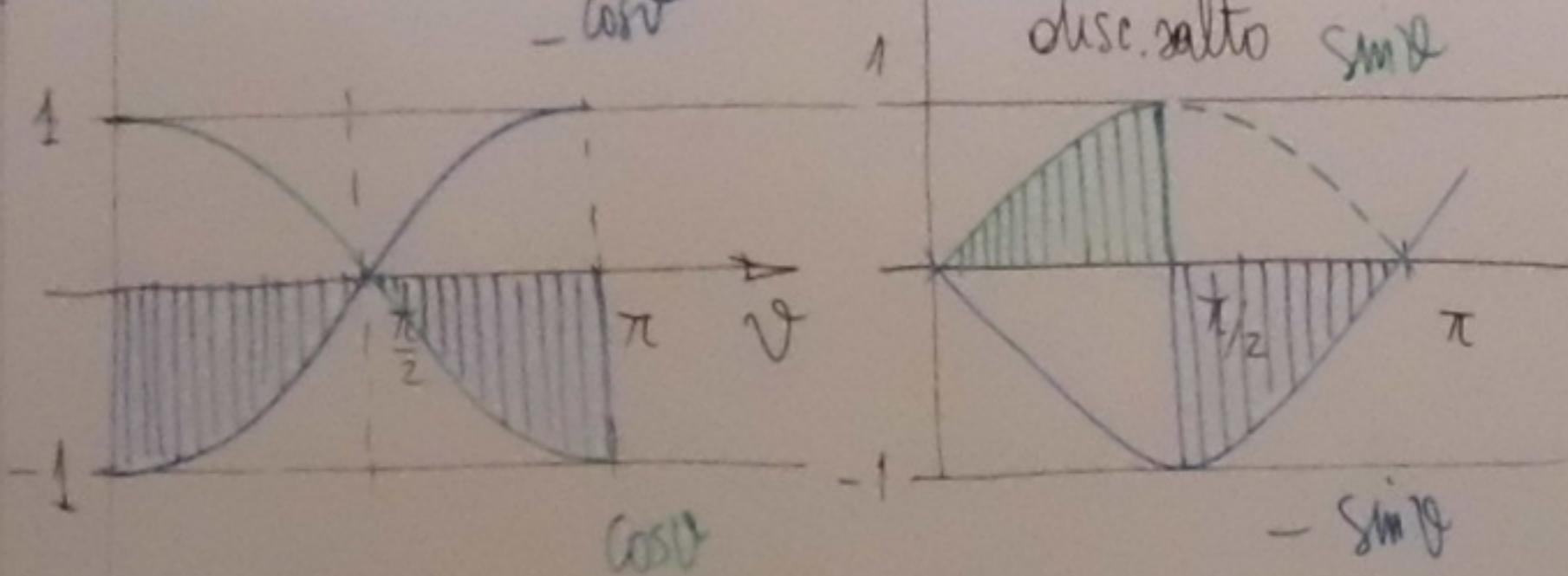
$$\sum F_n^{\text{su}} = 0 \Rightarrow T(s) = \frac{P}{2} \sin \theta ; \quad T(\theta) = -N(\theta)$$

$$\sum M_g^{\text{su}} = 0 \Rightarrow M(s) = \frac{PR}{2} (1 - \cos \theta)$$

$$M(\theta) = \frac{PR}{2} \sin \theta = RT(\theta)$$

$$R = R_{\text{real}} \quad \cos^2 \theta = 1 - \sin^2 \theta$$

$$R(1 - \cos \theta) \quad \sin^2 \theta = \sin \theta$$



$$N(\theta^*) = -\frac{P}{2} \cos \theta^* = \frac{P}{2} \cos^2 \theta$$

$$T(\theta^*) = -\frac{P}{2} \sin \theta^* = -\frac{P}{2} \sin^2 \theta$$

$$M(\theta^*) = \frac{PR}{2} (1 - \cos \theta^*) = PR (1 + \cos \theta)$$



