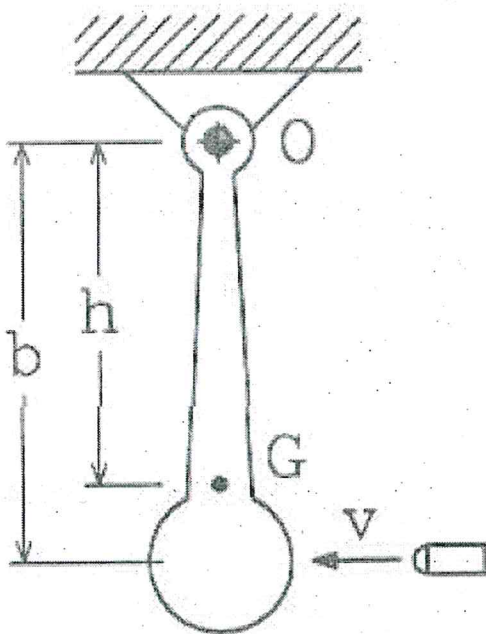


Il pendolo raffigurato, avente una massa $M=25 \text{ kg}$ e un raggio d'inerzia rispetto all'estremità O pari a $\rho_O=0.95 \text{ m}$, viene colpito da un proiettile avente una massa $m=30 \text{ g}$ e una velocità $v=500 \text{ m/s}$. Sono dati: $h=0.9 \text{ m}$, $b=1.1 \text{ m}$.

Supponendo che il proiettile rimanga conficcato nel pendolo, calcolare la velocità angolare di quest'ultimo immediatamente dopo l'urto.



$$\bar{Q} = m\bar{v} \quad \bar{K}_0 = \bar{Q} \cdot \bar{b}$$

$$K_0 = Q \cdot b$$

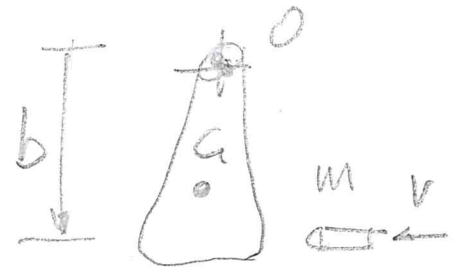
$$\Delta K_0 = 0 \quad \sum \vec{M}_0 = \vec{0}$$

$$m v b = m \omega b^2 + I_0 \omega$$

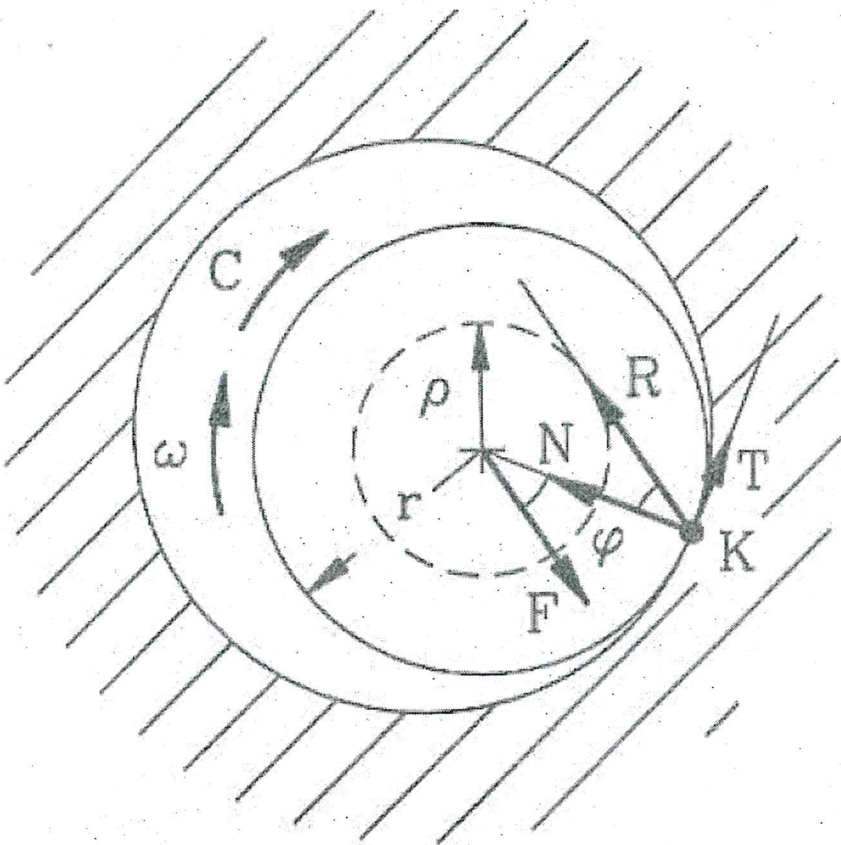
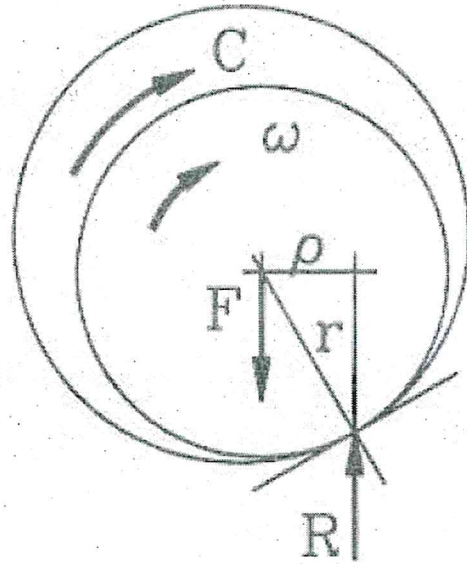
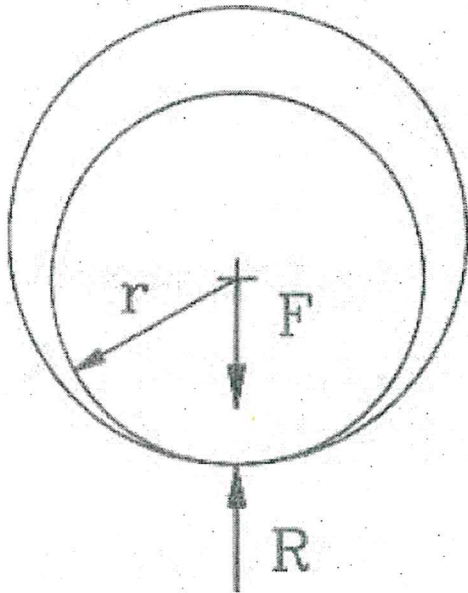
$$\text{kg} \frac{\text{m}}{\text{s}} \text{ m} \quad \text{kg} \frac{1}{\text{s}} \text{ m}^2 + \text{kg} \text{ m}^2 \frac{1}{\text{s}}$$

$$30 \cdot 10^{-3} \cdot 500 \cdot 1,1 = \omega (30 \cdot 10^{-3} \cdot 1,1^2 + 22,56)$$

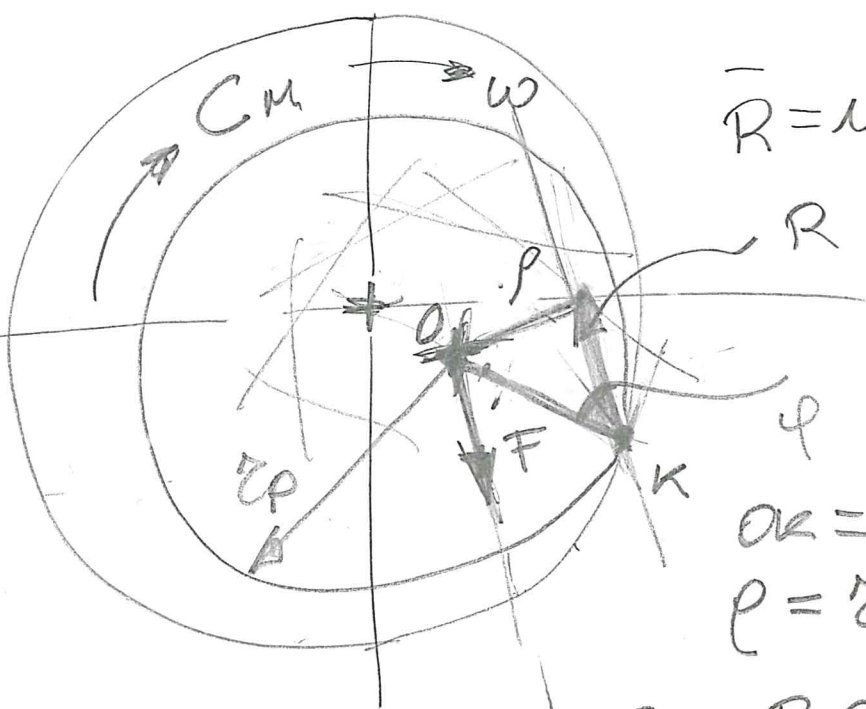
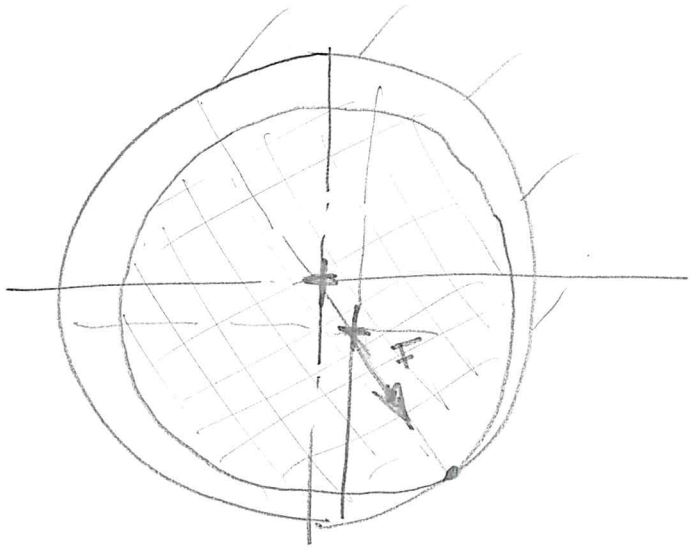
$$\omega = 0,23 \frac{\text{rad}}{\text{s}} = \frac{1,25}{22,56}$$



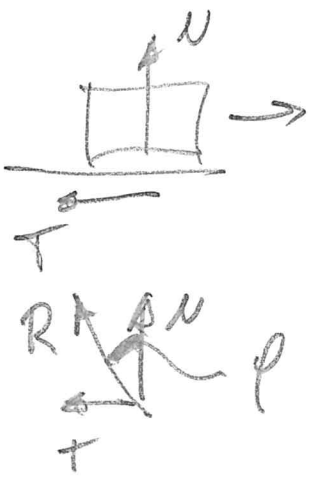
$$I_0 = M \cdot c^2 = 22,56 \frac{\text{kg} \cdot \text{m}^2}{\text{s}}$$



PERNO AD
 ANNO
 SECCO



$$\bar{R} = N + T$$



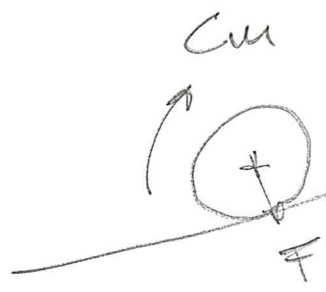
$$OR = z$$

$$\rho = \sum_P \sin \varphi$$

$$C_M = R \rho$$

$$R = F$$

$$C_M = F \rho$$

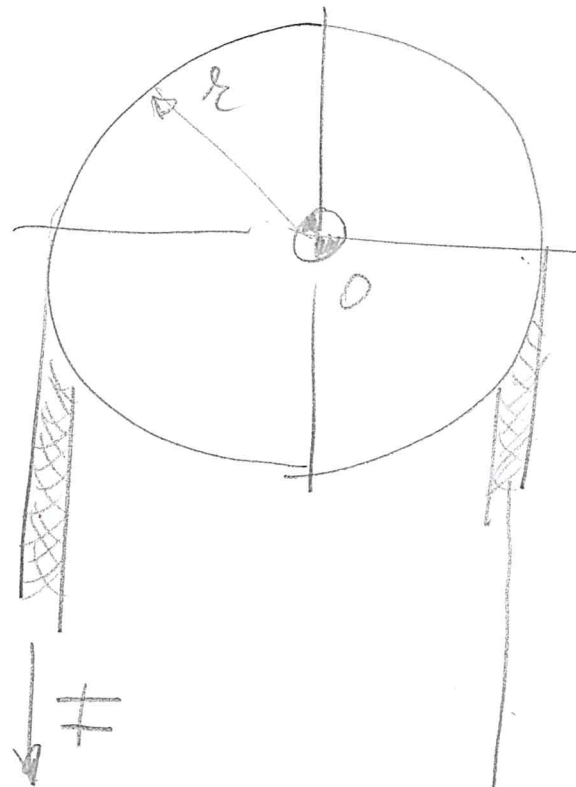


PULEGNA DI SOLLEVAMENTO

SENZA ATTREDDO

$$\ddot{x} = 0$$

$$F = mg$$



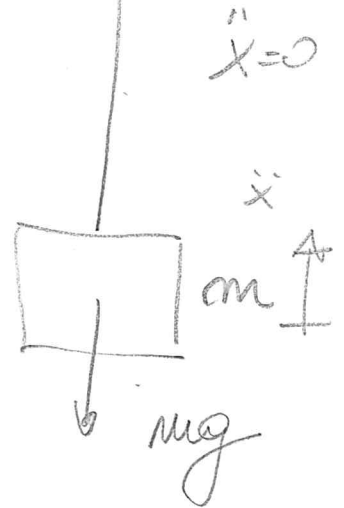
ATTREDDO AL PEDANO

$$f = 0,1 \quad M = 100 \text{ kg}$$

$$z_p = 0,5 \text{ cm}$$

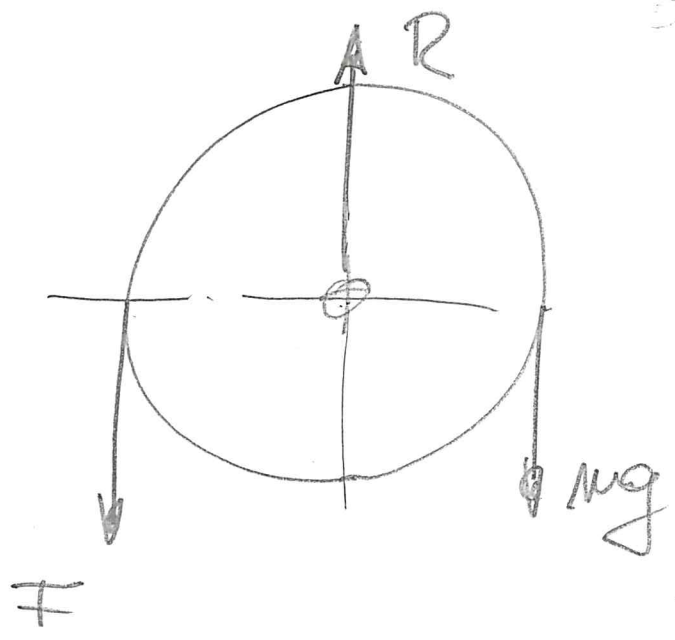
$$z = 0,1 \text{ m}$$

F PER FAR SALIRE IL CARICO?



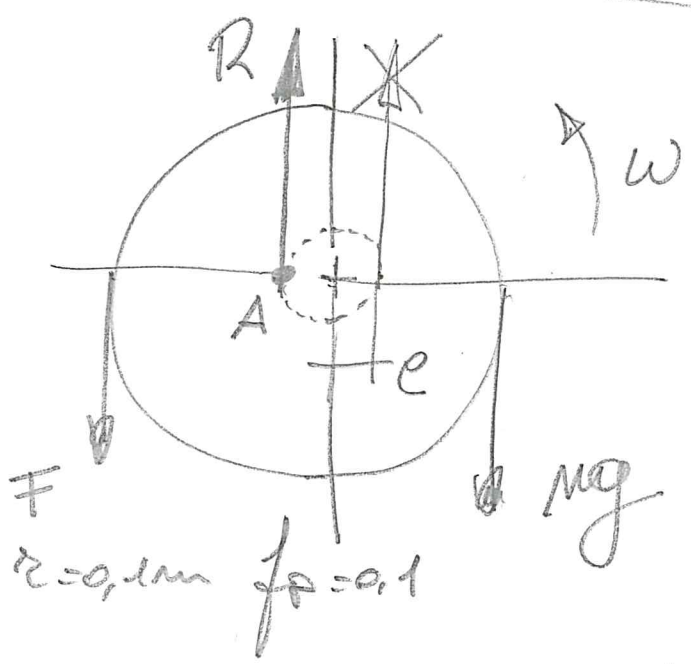
SENZA ATTURNO

$$F = mg = 981 \text{ N}$$



CON ATTURNO
NEL PERNO
CARICO IN SACITA

$$\uparrow R = F + mg$$



$$M = 100 \text{ kg} \quad r_p = 0,5 \text{ cm} \quad r = 0,1 \text{ m} \quad f_p = 0,1$$

$$F + mg - R = 0$$

A)

$$F(r - e) - mg(e + e) = 0$$

$$\varphi = \arctan \frac{f_p}{1} = 5,71^\circ$$

$$e = r_p \sin \varphi = 0,05 \text{ cm}$$

$$F = mg \frac{e + e}{r - e} = 100 \cdot 9,81 \frac{0,1 + 0,05 \cdot 10^{-2}}{0,1 - 0,05 \cdot 10^{-2}} =$$

$$= 981 \frac{0,1005}{0,0995} = 981 \cdot 1,01 = 990,86 \text{ N}$$

CARICO IN
DISCOSA

6

$$R - F - mg = 0$$

$$F(r + e) - mg(r - e) = 0$$

$$F = mg \frac{r - e}{r + e}$$

