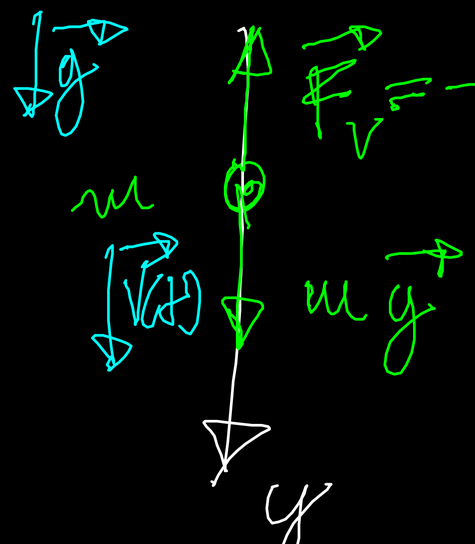
ATTRITO VISCOSO

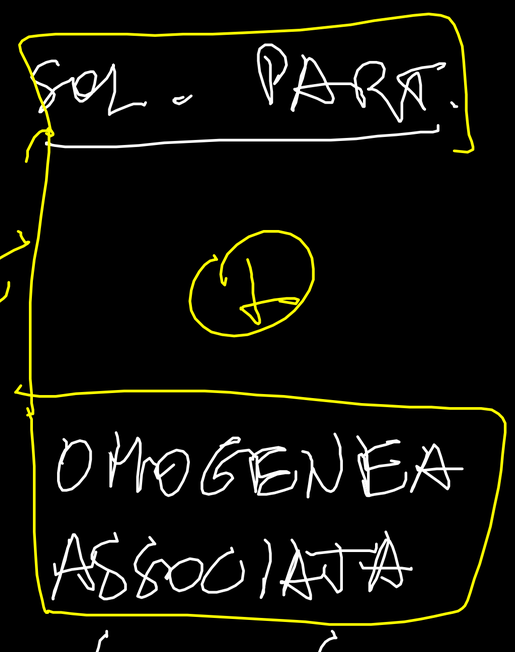


$$ma_y = g - \frac{b}{m}v_y$$

$$\frac{dV(t)}{dt} = g - \frac{b}{m}V(t)$$

SOL. GEN. = SOL. PART. + SOL. OMOG.

SOL. PART.



OMOGENEA ASSOCIATA

$$V(t) = K'e^{-\frac{b}{m}t} + \frac{mg}{b}$$

$$V(t) = V_1 = \text{COST}$$

$$V_1 = \frac{mg}{b}$$

SOL PART.

$$\frac{dV}{dt} = -\frac{b}{m}V \qquad V = V(t)$$

$$\int \frac{dV}{V} = \int -\frac{b}{m}dt + K$$

$$(\ln V) = \left(-\frac{b}{m}t + K\right) \Rightarrow V(t) = e^{-\frac{b}{m}t}e^{K}$$

$$e = e$$

$$= K'e^{-\frac{b}{m}t}$$

$$\Rightarrow V(t) = K'e^{-\frac{b}{m}t}$$

SOL. GEN.: $\boxed{V(t) = K' e^{-\frac{b}{m}t} + \frac{mg}{b}}$

$V(0) = 0$

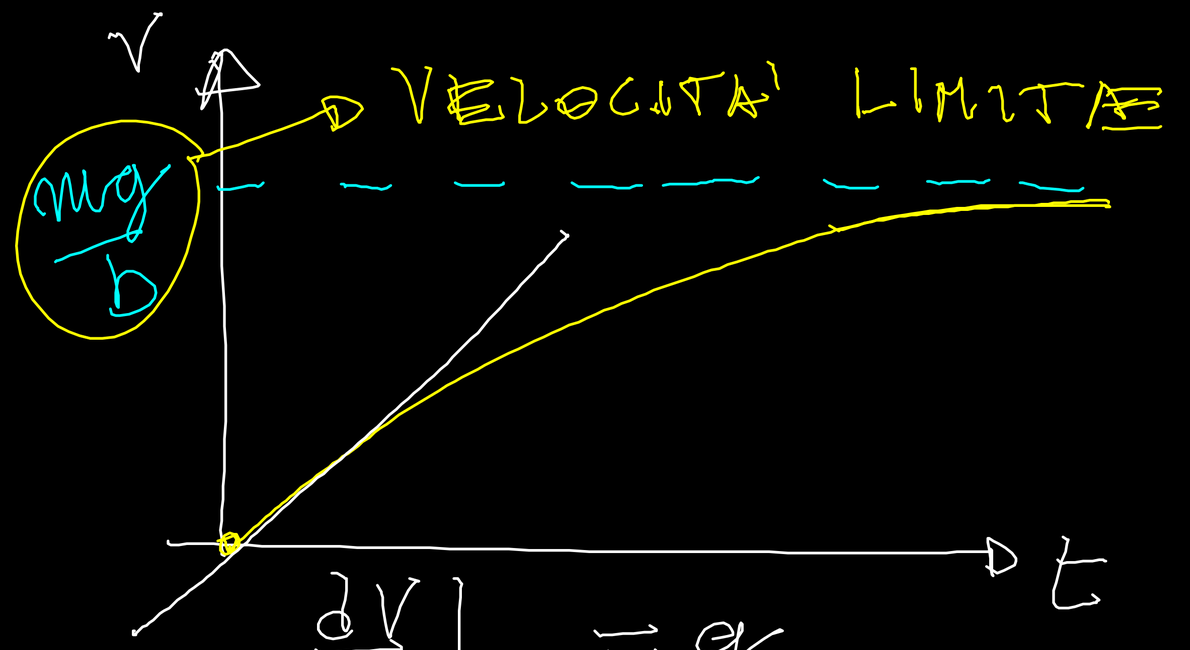
$0 = K' + \frac{mg}{b}$

$-\frac{mg}{b} = K'$

$V(t) = -\frac{mg}{b} e^{-\frac{b}{m}t} + \frac{mg}{b} = \frac{mg}{b}\left(1 - e^{-\frac{b}{m}t}\right)$

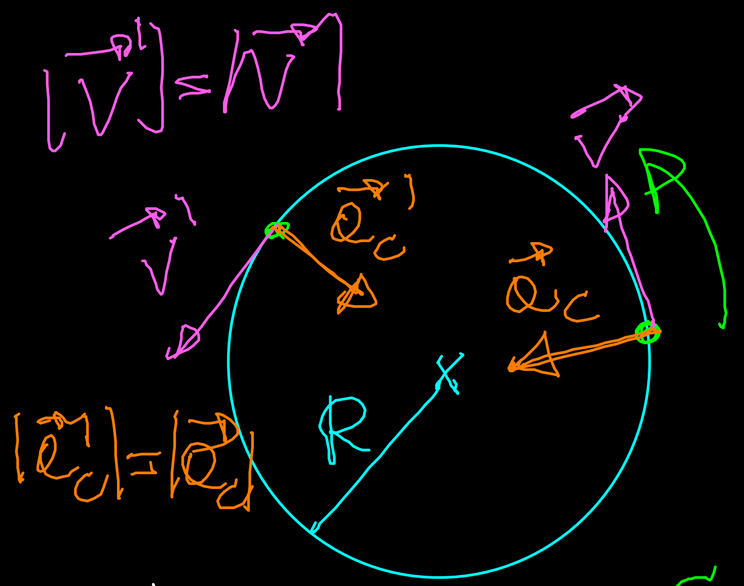
$b = \frac{[Kg]}{[s]}$

$\frac{mg}{b} = \frac{[Kg]\,[m]}{[Kg]\,[s]^2} = \frac{[m]}{[s]}$



$\left.\frac{dV}{dt}\right|_{V=0} = g$

DINAMICA DEL MOTO CIRC. UNIF.



$$\sum \vec{F} = m\vec{a}_c$$

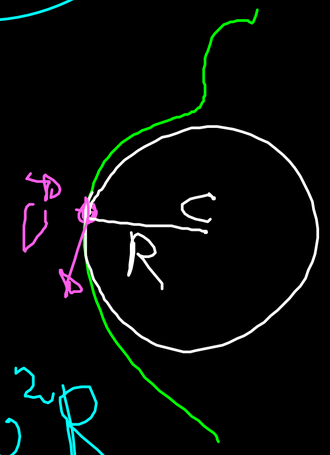
FORZA CENTRIPETA

$$\left|\sum \vec{F}\right| = \frac{mV^2}{R}$$

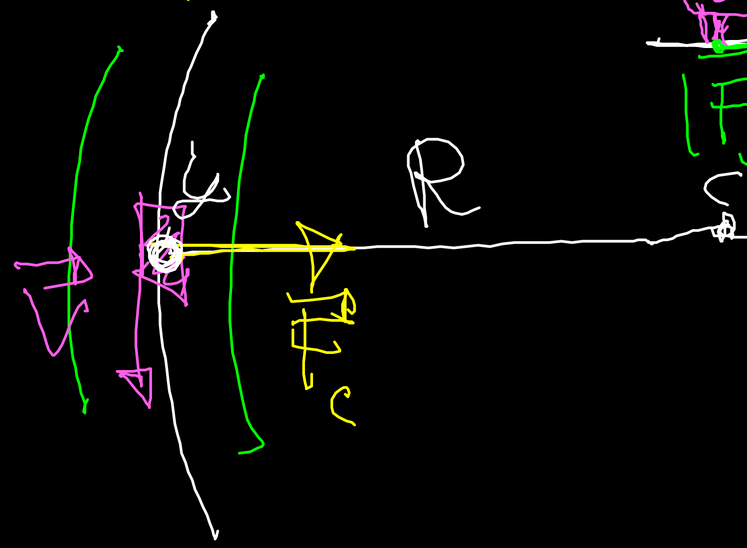
$|\vec{V}| = \text{COST}$

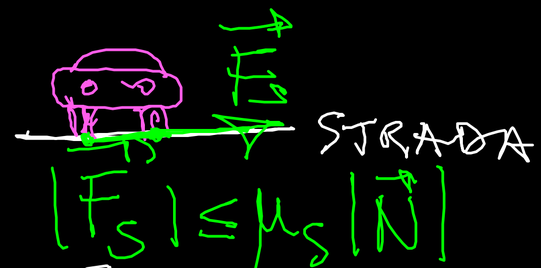
$$\omega = \frac{V}{R}$$

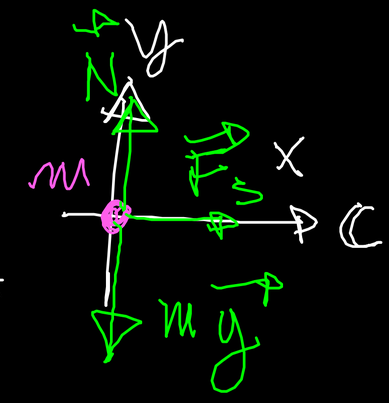
$$a_c = \frac{V^2}{R} = \omega^2 R$$



ESEMPIO







$(y) \Rightarrow N = mg$

$(x) \Rightarrow F_s = ma_c$

$$F_s = m a_c$$

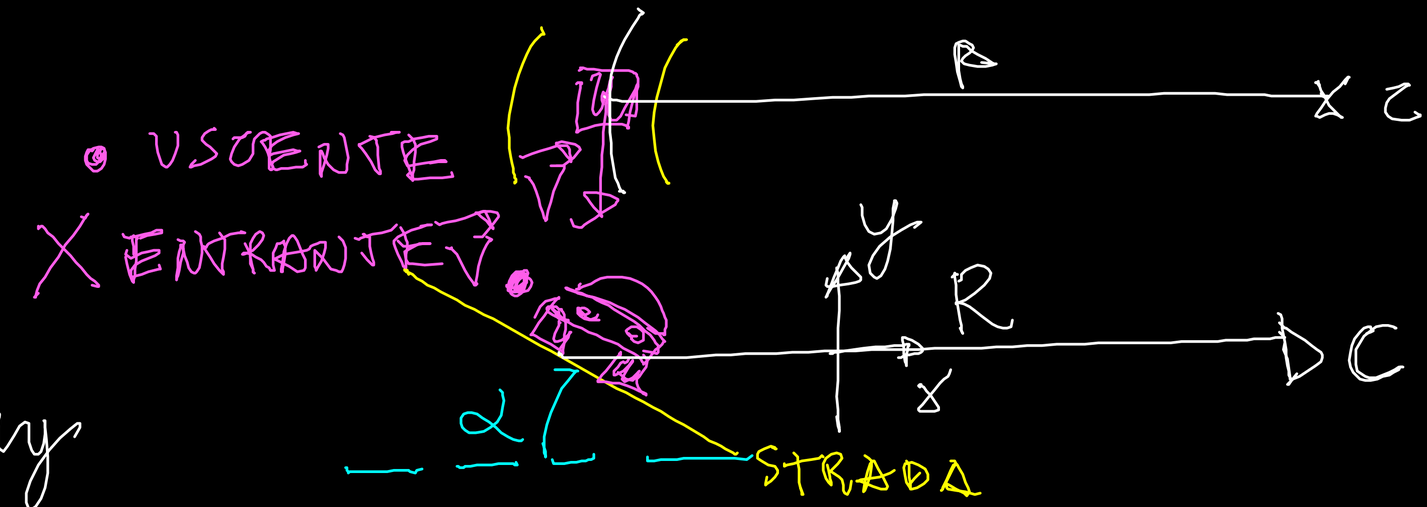
$$|\vec{F}_s| = F_s \leq \mu_s N = \mu_s m g$$

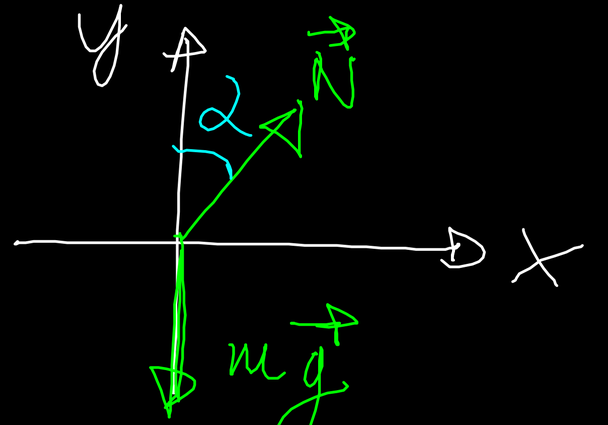
$$m a_c \leq \mu_s m g$$

$$\frac{V^2}{R} \leq \mu_s g$$

$$V \leq \sqrt{\mu_s g R}$$

$$\tan\alpha = \frac{V^2}{gR}$$



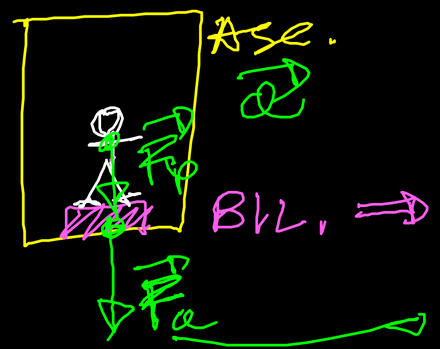


$$(y) \quad -mg + N\cos\alpha = 0 \Rightarrow N = \frac{mg}{\cos\alpha}$$

$$(x) \quad N\sin\alpha = m a_c = m\frac{V^2}{R}$$

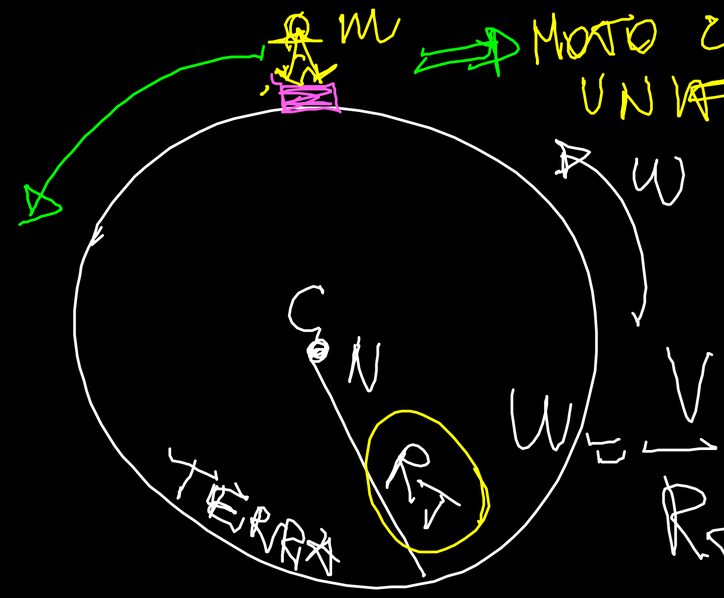
$$\Leftarrow g\tan\alpha = \frac{V^2}{R} \Rightarrow V = \sqrt{gR\tan\alpha}$$

PESO APPARENTE

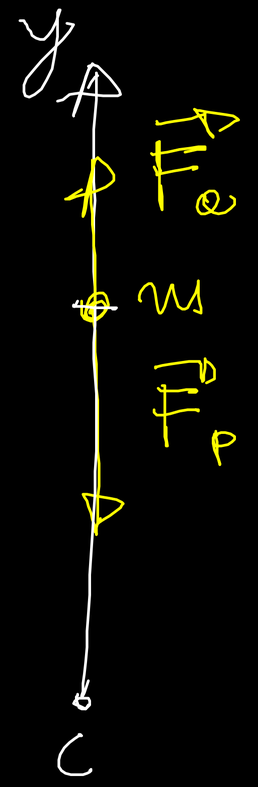


BIL. $\Rightarrow$ PESO APPARENTE

$\vec{F}_e = \vec{F}_p \Leftrightarrow m\vec{g}$ se $\vec{a} = 0$



$\omega = \frac{V}{R_T} = \frac{2\pi R_T}{T} = \frac{2\pi}{T}$ $\quad T = 86400\ s$



$\vec{F}_p + \vec{F}_e = m\vec{a}_C$

$-mg + F_e = -m\frac{V^2}{R}$

$F_e = mg - m\omega^2 R$

$= m\left(g - \frac{(2\pi)^2 R_T}{T^2}\right)$ $\quad R_T = 6400\ Km$