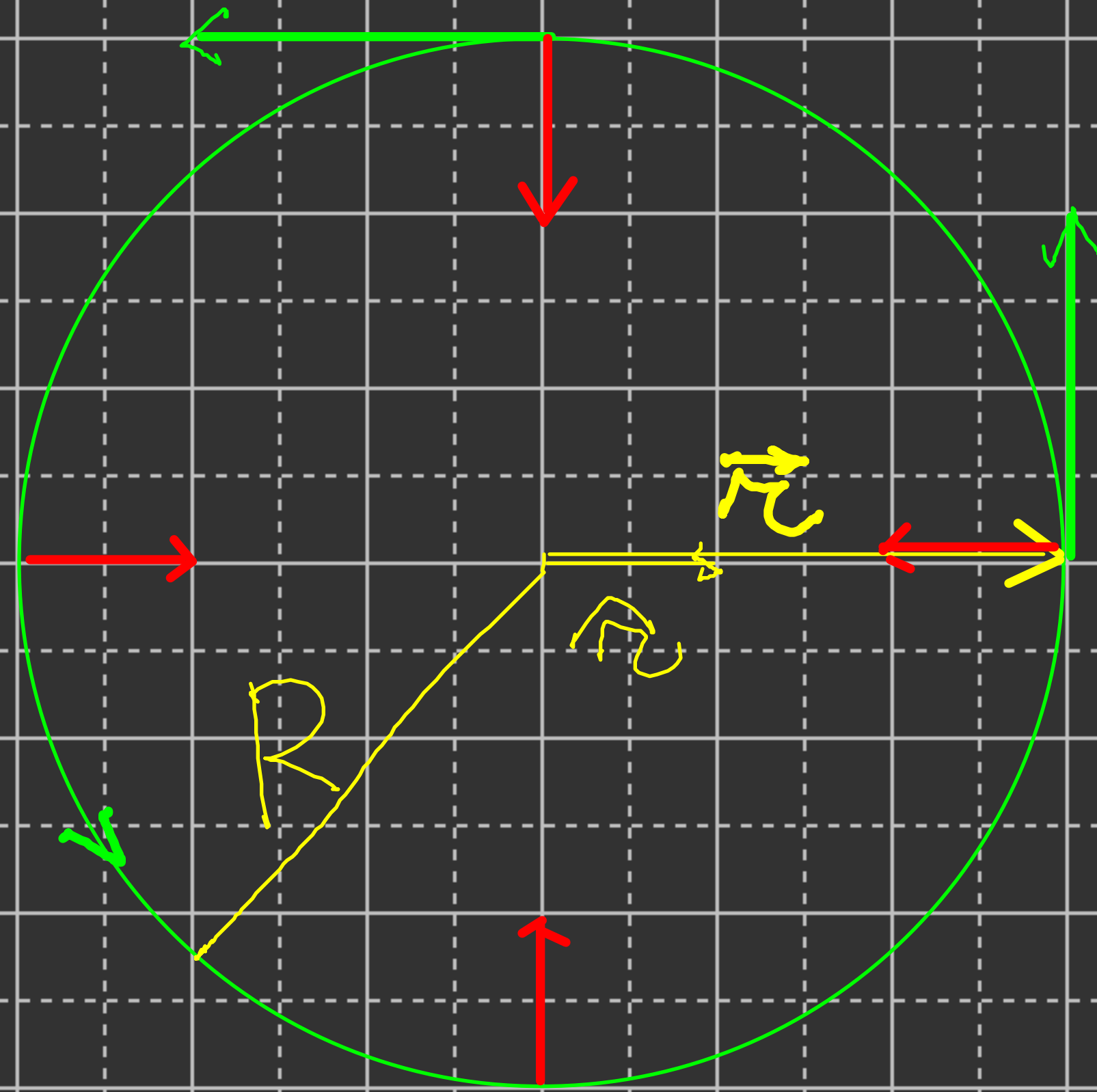


Dinamica del moto circolare uniforme



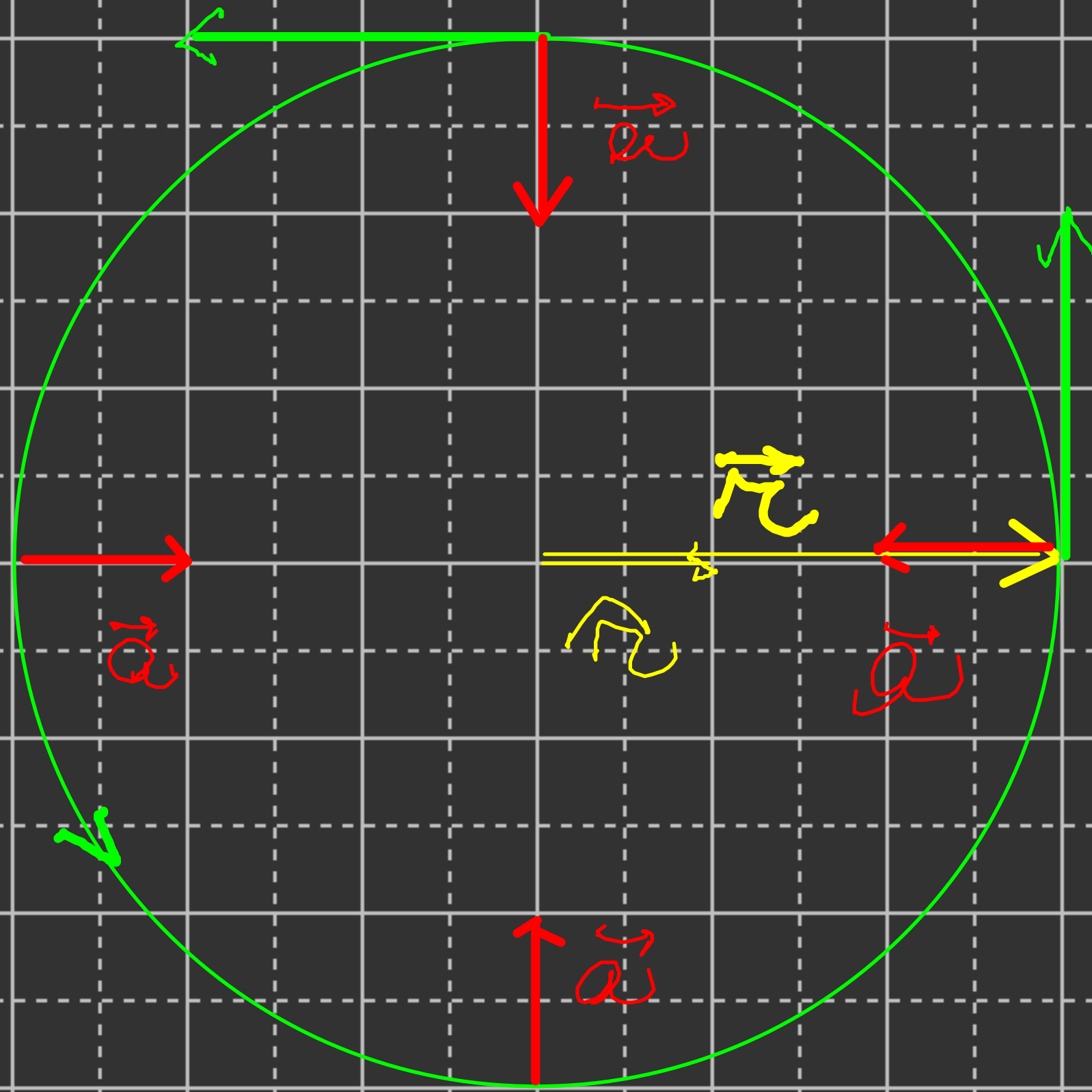
m

$$v = |\vec{v}| = \omega r$$

$$\vec{a} \neq 0$$

$$|\vec{a}| = a_c = \frac{v^2}{R}$$

Dinamica del moto circolare uniforme



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



$$\sum \vec{F} = -\frac{m v^2}{R} \hat{r}$$

m

$$v = |\vec{v}| = \omega r$$

$$\vec{a} \neq 0$$

$$|\vec{a}| = a_c = \frac{v^2}{R}$$

Osservo in un sist
inertiale questo moto

Esempi:

Forze centripete

1) Pianeta attorno al sole

gravitaz.

2) elettrone attorno nucleo H

elettrica

3) Pendolo conico

$\sum \vec{F} =$ comp
angz.
tens.
filo

4) Auto in curva

$\sum \vec{F} = \dots$
forza attrist

5) " " " Sopraelevata

" =

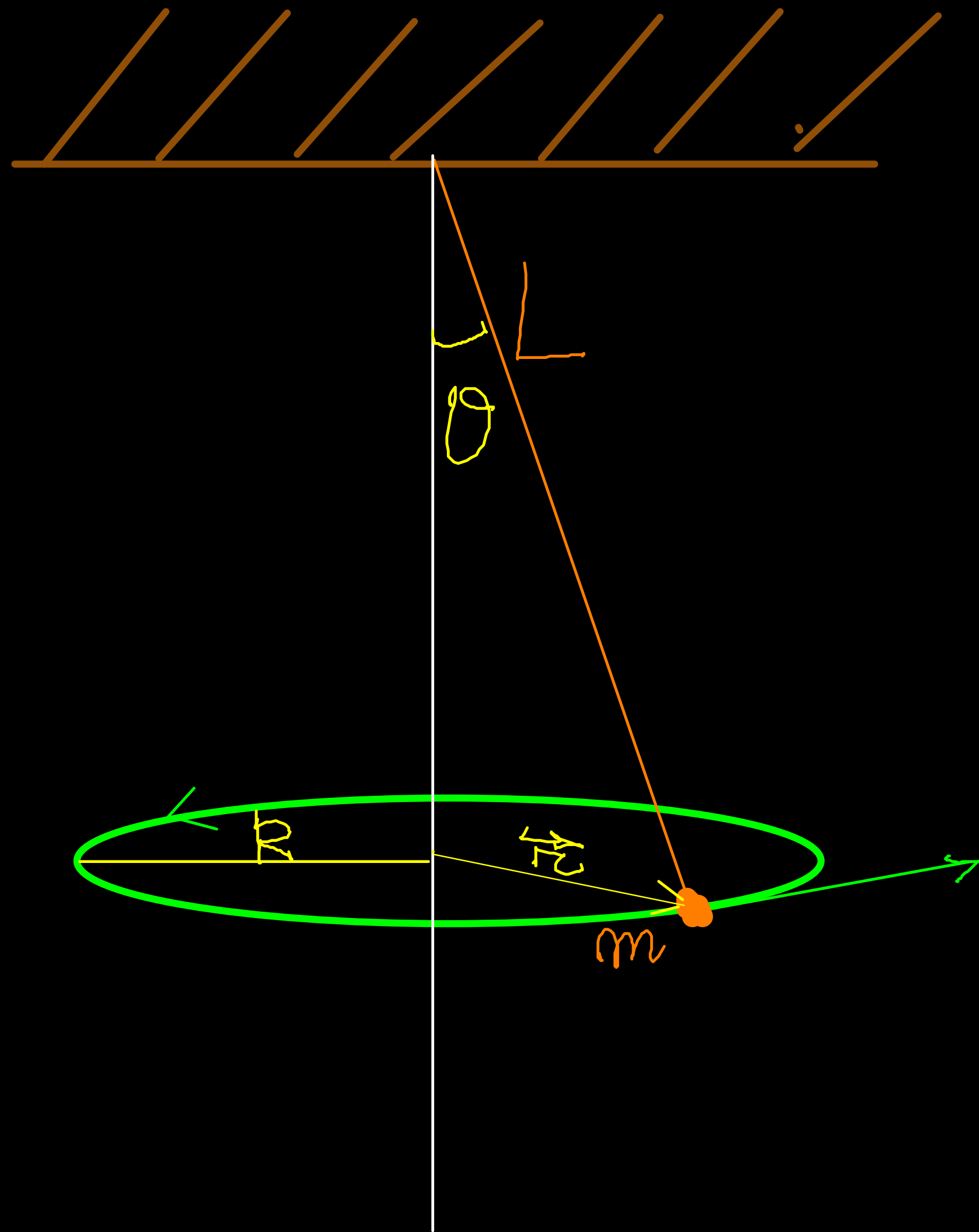
versore \hat{r} radiale punta

per def. verso l'esterno

Forza risultante centripeta

(opposta a \hat{r})

6.14 Pendolo conico



L

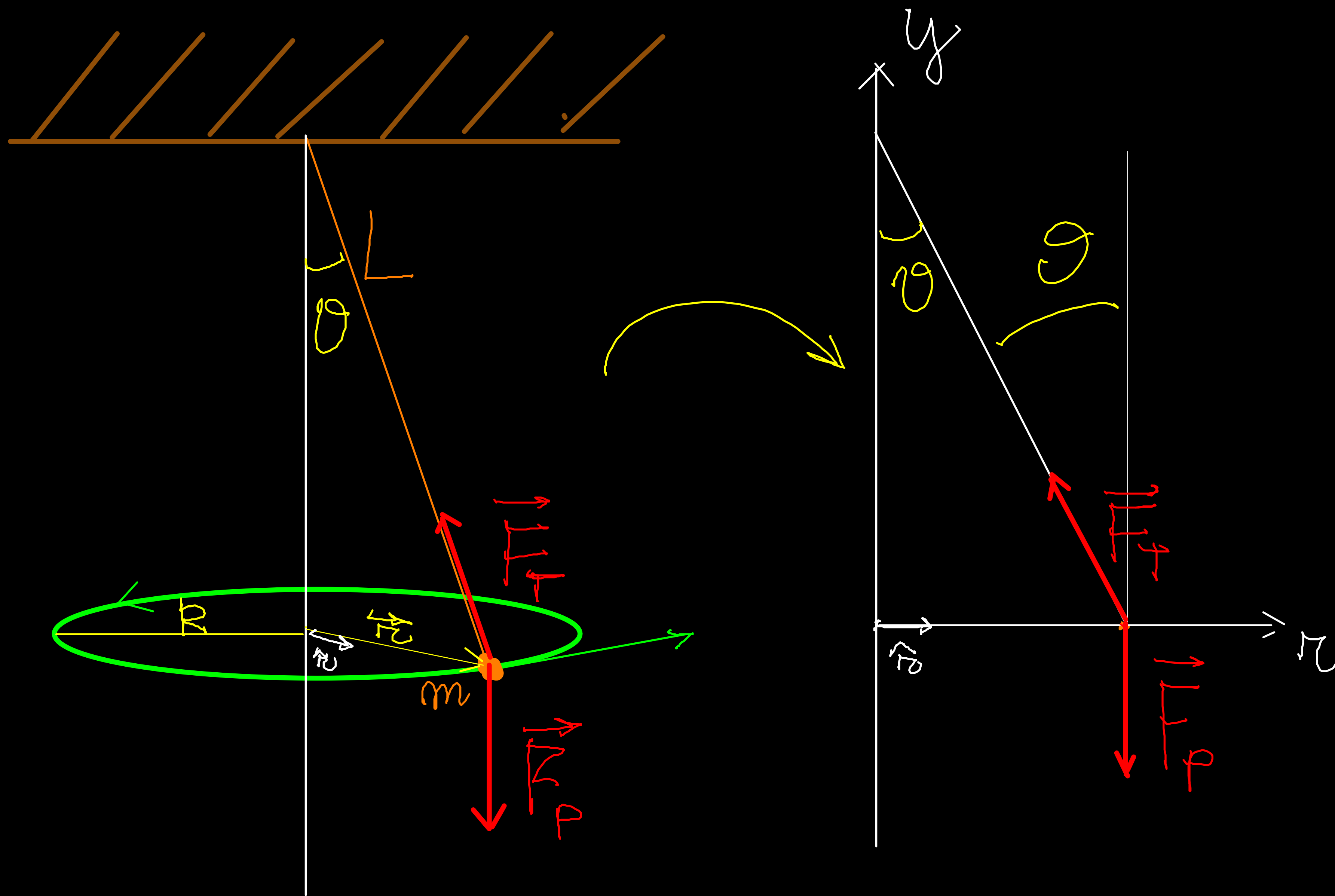
m

$$\theta = \text{cost}$$

$$v = \text{cost}$$

$$R = |\vec{r}| = L \sin \theta$$

6.14 Pendolo conico



6.14 Pendolo conico

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

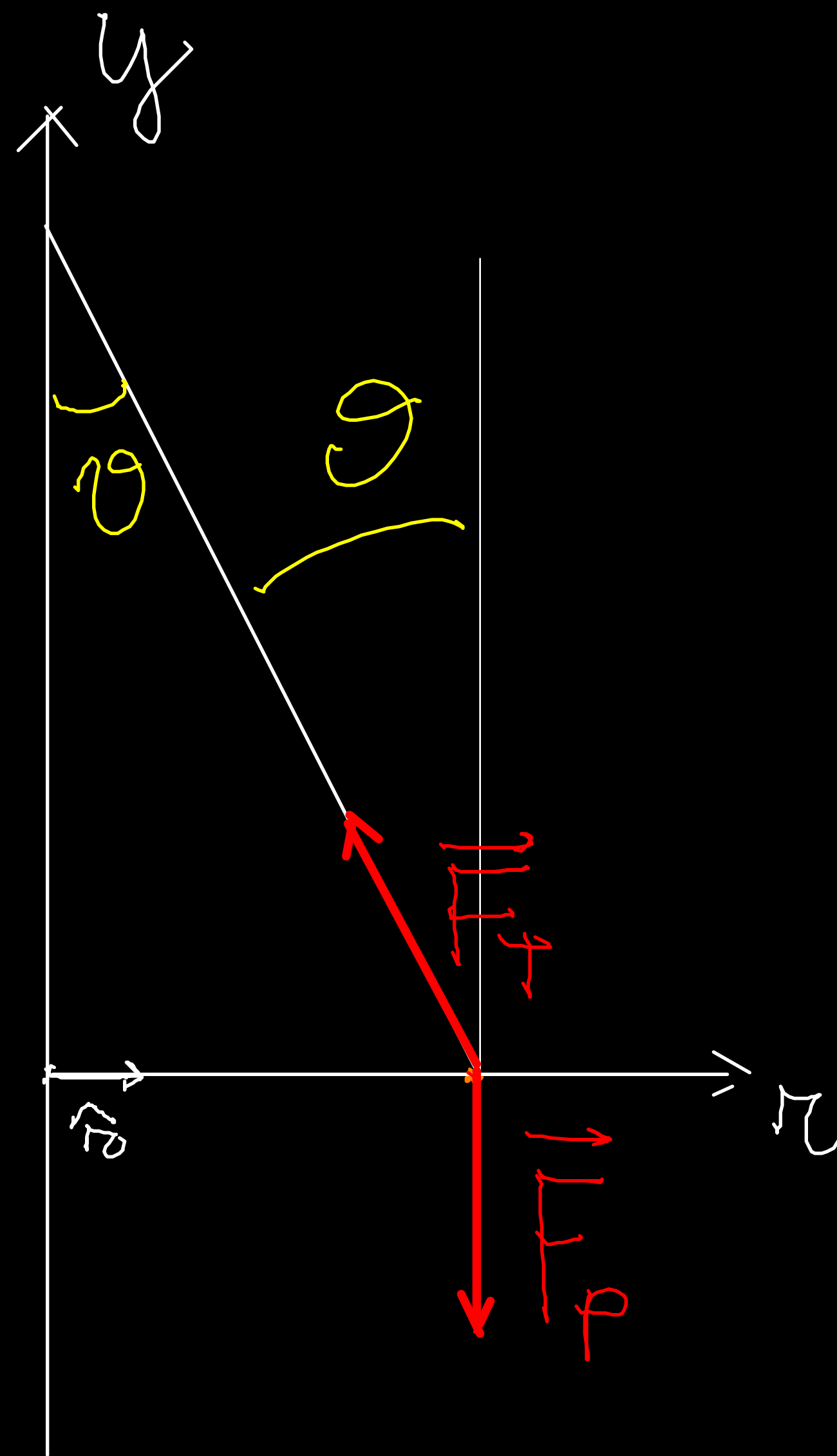
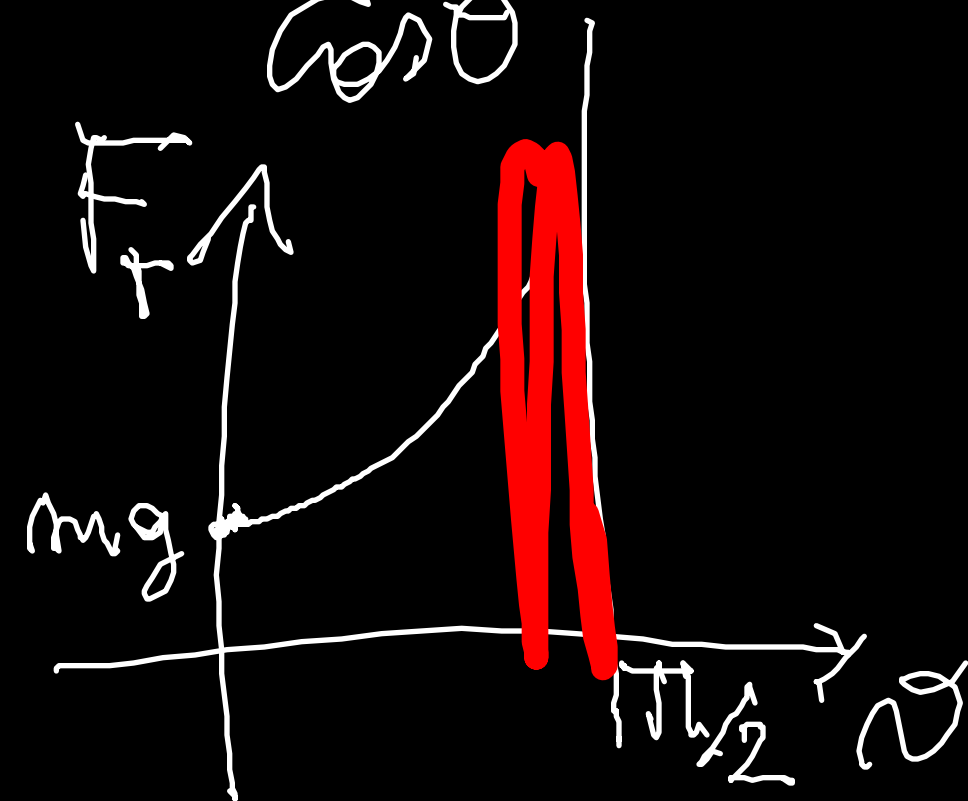
$$\vec{F}_T + \vec{F}_p = m \vec{a}_c$$

proietto $\begin{cases} y \\ r \end{cases}$

$$\begin{cases} F_{Ty} + F_{py} = 0 \\ F_{Tr} + 0 = m a_c \end{cases}$$

y) $F_T \cos \theta - mg = 0 \rightarrow F_T = \frac{mg}{\cos \theta}$

Nota: $F_T > mg$!



6.14 Pendolo conico

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

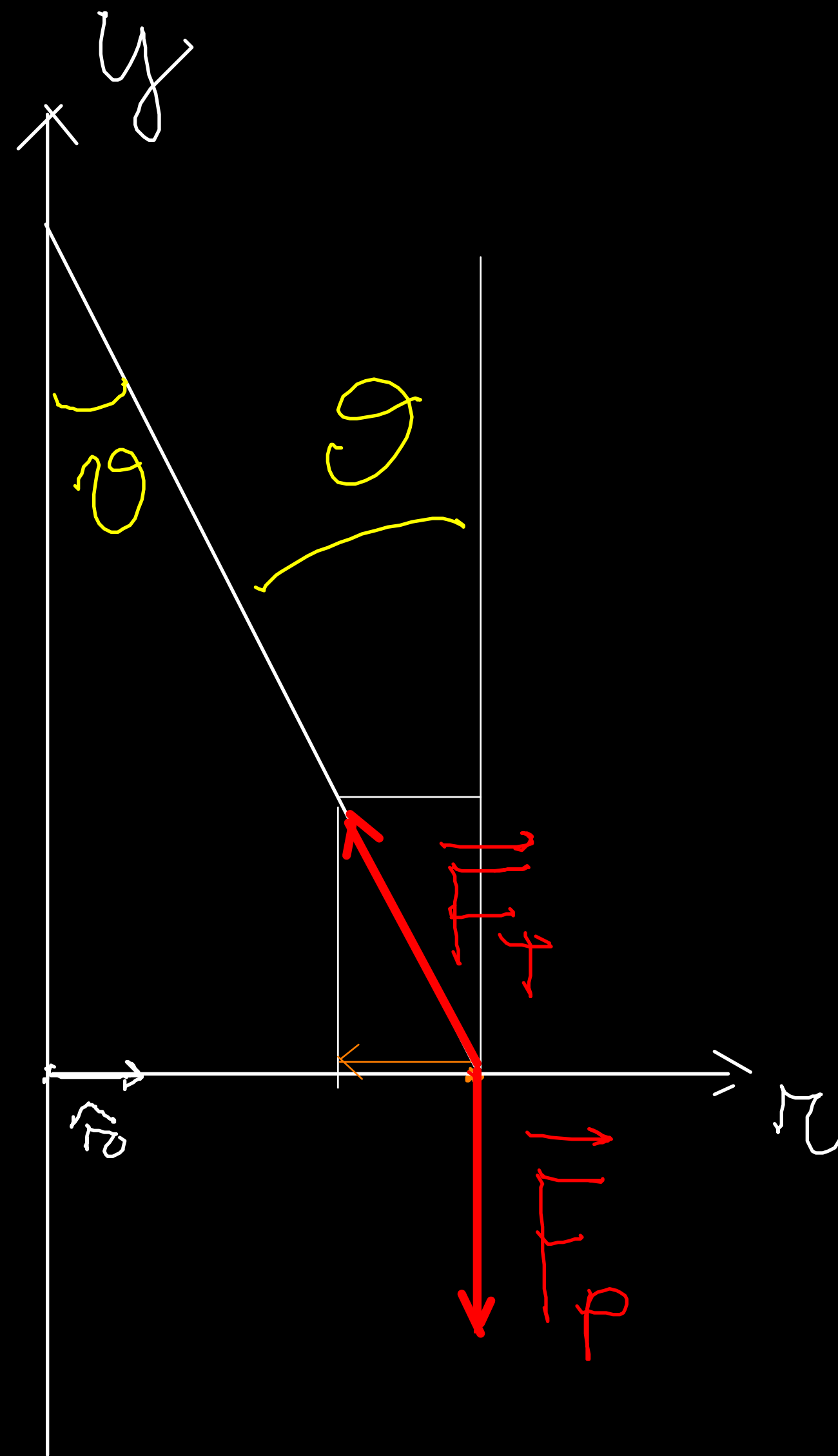
$$\vec{F}_T + \vec{F}_p = m \vec{a}_c$$

proietto $\begin{cases} y \\ r \end{cases}$

$$\begin{cases} F_{Ty} + F_{py} = 0 \\ F_{Tr} + 0 = m a_c \end{cases}$$

y) $F_T \cos \theta - mg = 0 \rightarrow F_T = \frac{mg}{\cos \theta}$

r) $-F_T \sin \theta = -\frac{m v^2}{R}$



$$\frac{mg}{\cos \theta} \sin \theta = \frac{mv^2}{R}$$

$$v^2 = Rg \tan \theta$$

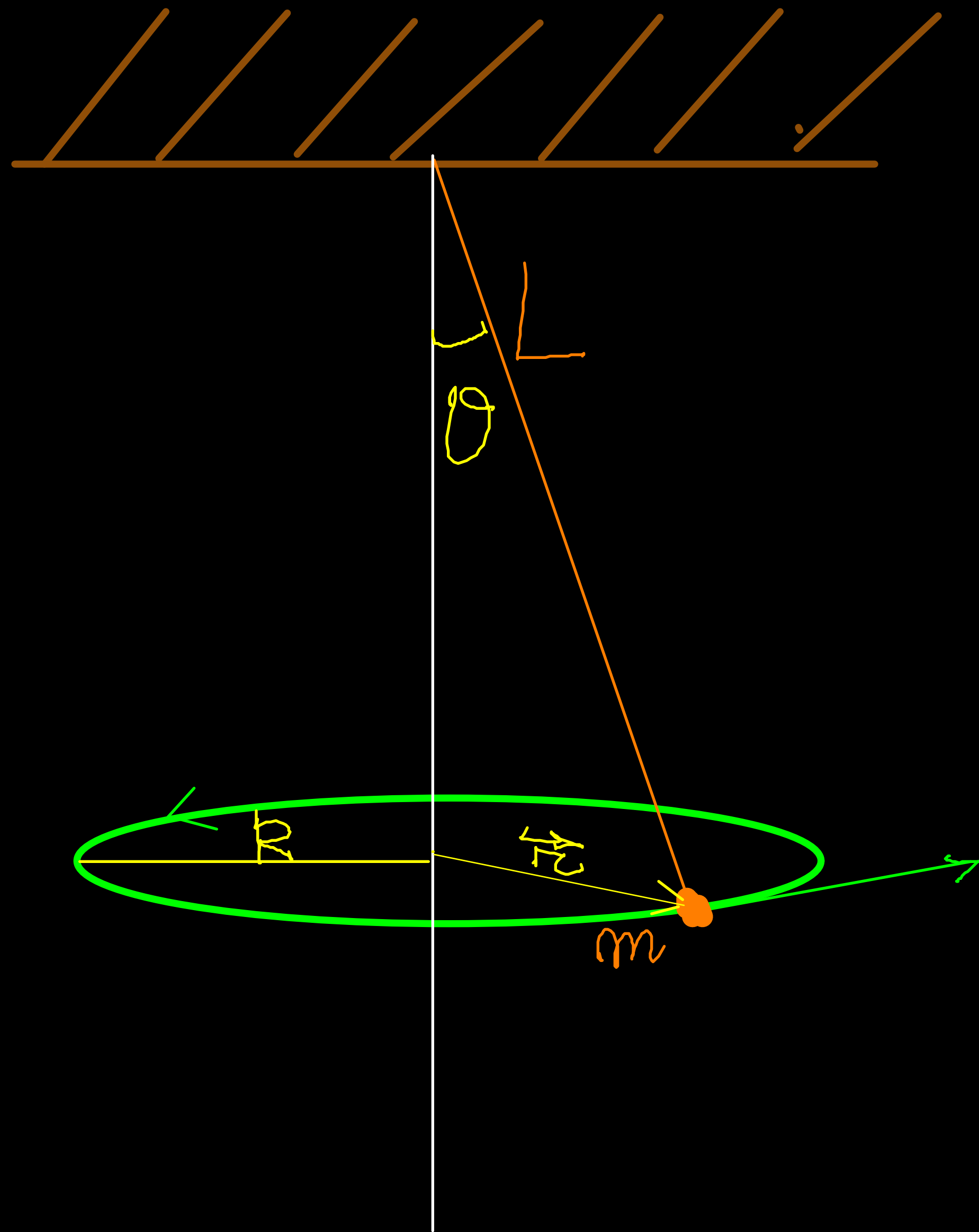
$$R = L \sin \theta$$

$$v^2 = gL \sin \theta \tan \theta$$

$$v = \frac{2\pi R}{T}$$

posso
ricorrere
 $g(L, \theta, T)$

6.14 Pendolo conico



L

m

$$\theta = \text{cost}$$

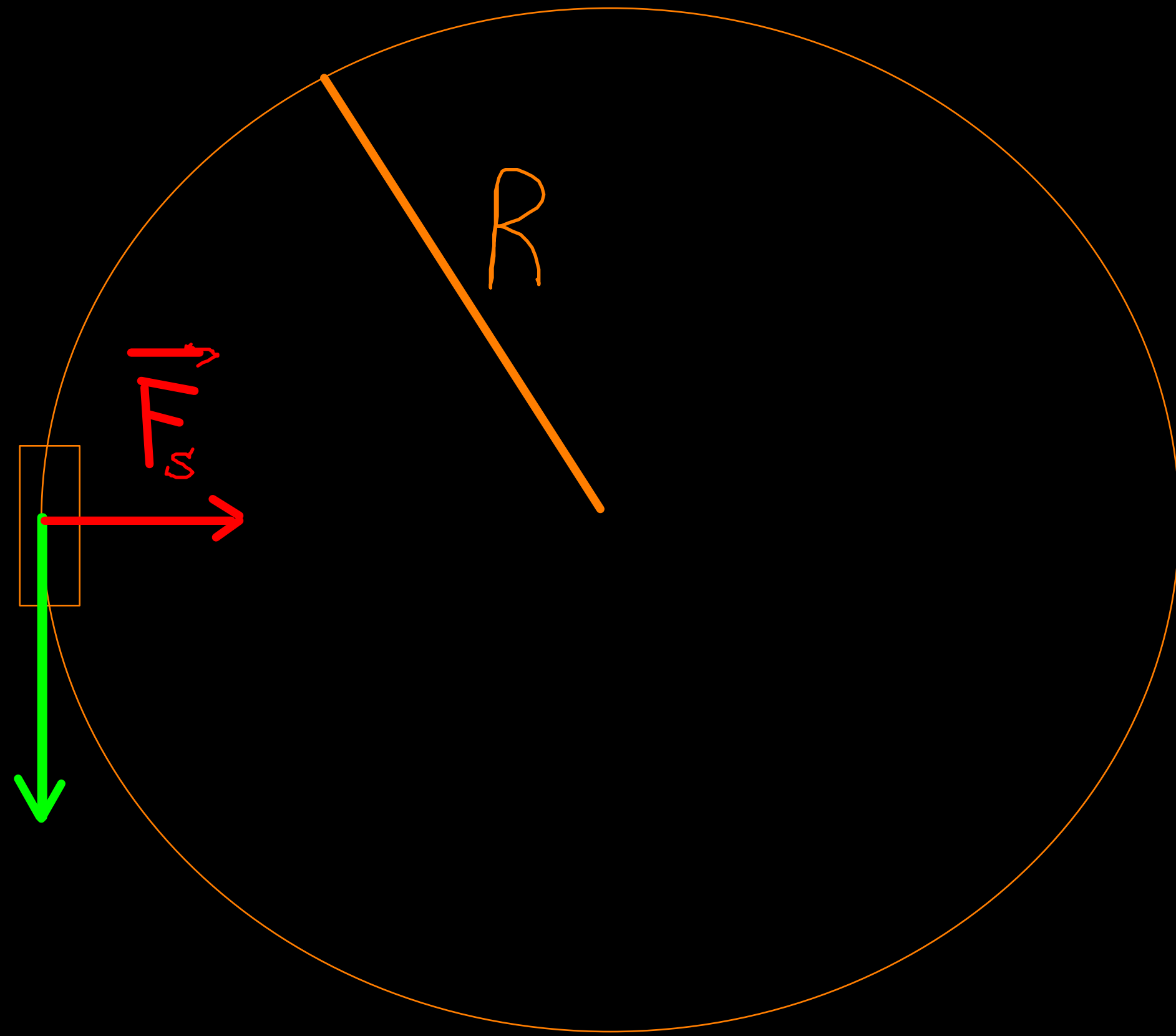
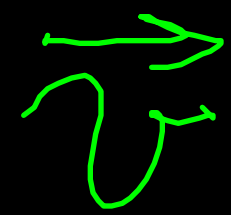
$$v = \text{cost}$$

$$R = |\vec{r}| = L \sin \theta$$

Curva piana

Vista
dall'alto

Automobile



in sezione

