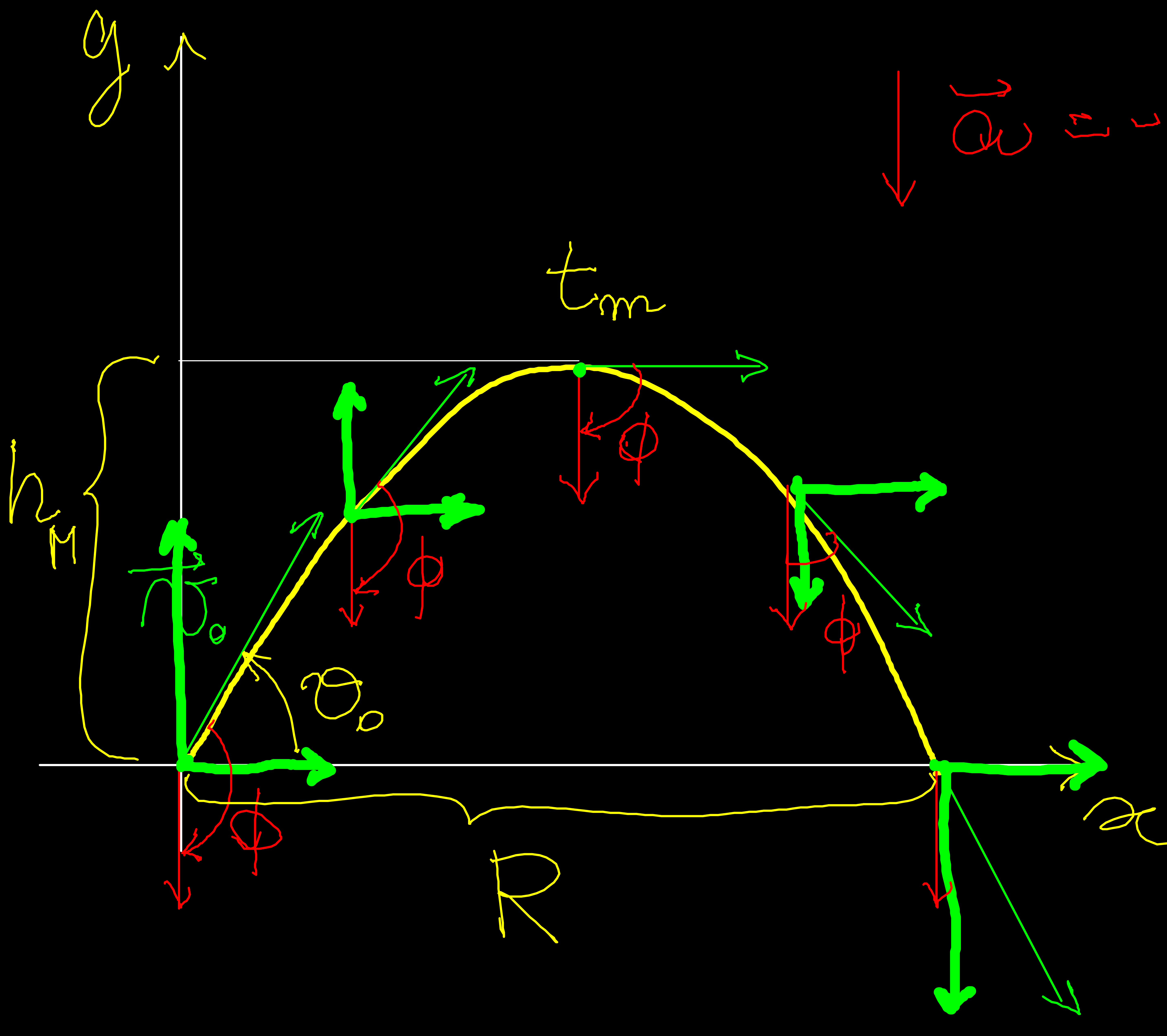
$$
\begin{cases}
t = \dfrac{x}{v_0 \cos\theta_0} \\[2ex]
y = \cancel{v_0} \operatorname{sen}\theta_0 \cdot \dfrac{x}{\cancel{v_0} \cos\theta_0} - \dfrac{1}{2} g \left(\dfrac{x}{v_0 \cos\theta_0} \right)^2
\end{cases}
$$

Traiettoria:

$$
y = (\operatorname{tg}\theta_0)\, x - \frac{g}{2 v_0^2 \cos^2\theta_0}\, x^2
$$



$\vec{a} = -g\,\hat{j}$

ϕ

Determino t_m

$v_y = 0$

$v_0 \operatorname{sen}\theta_0 - g t_m = 0$

$$\boxed{t_m = \frac{v_0 \operatorname{sen}\theta_0}{g}}$$

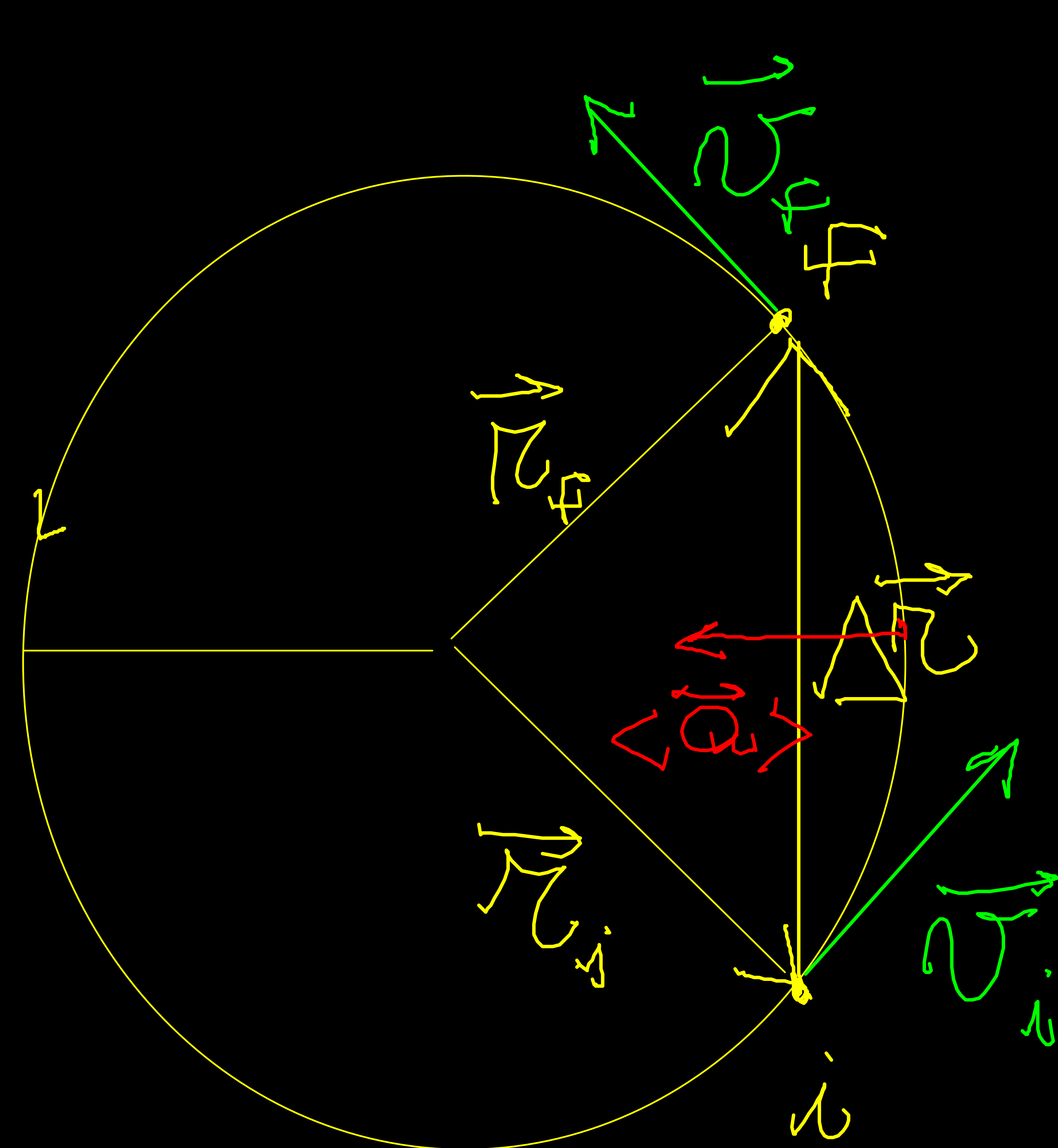
$$h_M = y(t = t_M) = \frac{(v_0 \,\text{sen}\, \theta_0)^2}{g} - \frac{1}{2} \cancel{g} \frac{(v_0 \,\text{sen}\, \theta_0)^2}{g^{\cancel{2}}}$$

$$= \frac{1}{2} \frac{(v_0 \,\text{sen}\, \theta_0)^2}{g} \qquad \frac{m^{\cancel{2}}}{\cancel{s^2}} \frac{\cancel{s^2}}{\cancel{m}}$$

Gittata per $t = 2t_M$

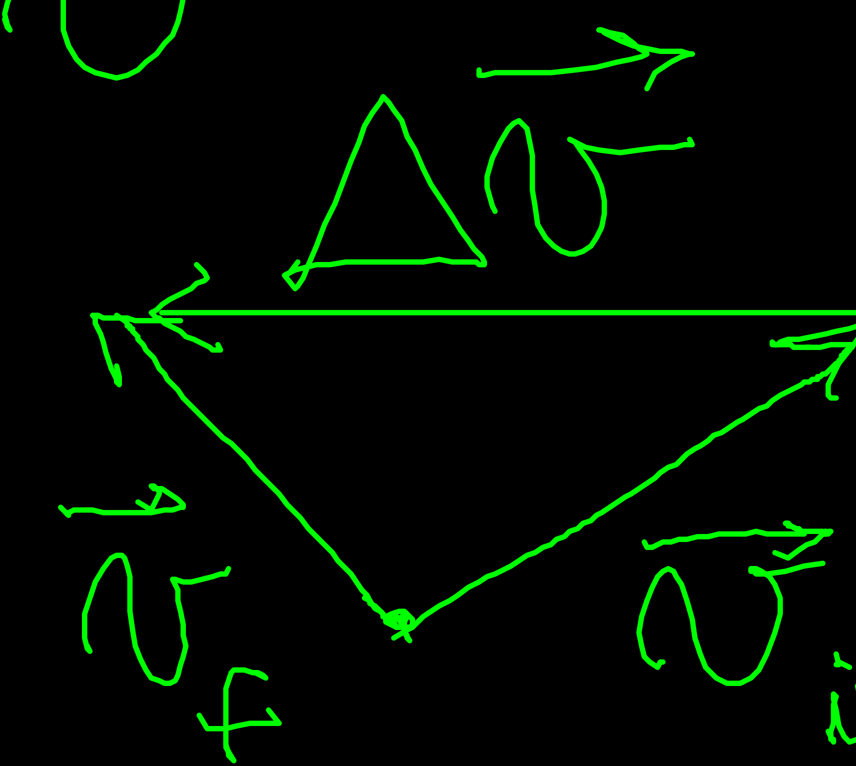
$$R = x(t = 2t_M) = \dots = \frac{v_0^2 \,\text{sen}\, 2\theta_0}{g}$$

$$R = R(\theta_0) \qquad 2\theta_0 = \frac{\pi}{2} \qquad \theta_0 = \frac{\pi}{4}$$



v = costante

$\vec{v}$



$\Delta\vec{v} \parallel \langle\vec{a}\rangle$

$$a = |\vec{a}| = \lim_{\Delta t \to 0} \frac{|\Delta \vec{v}|}{\Delta t} =$$

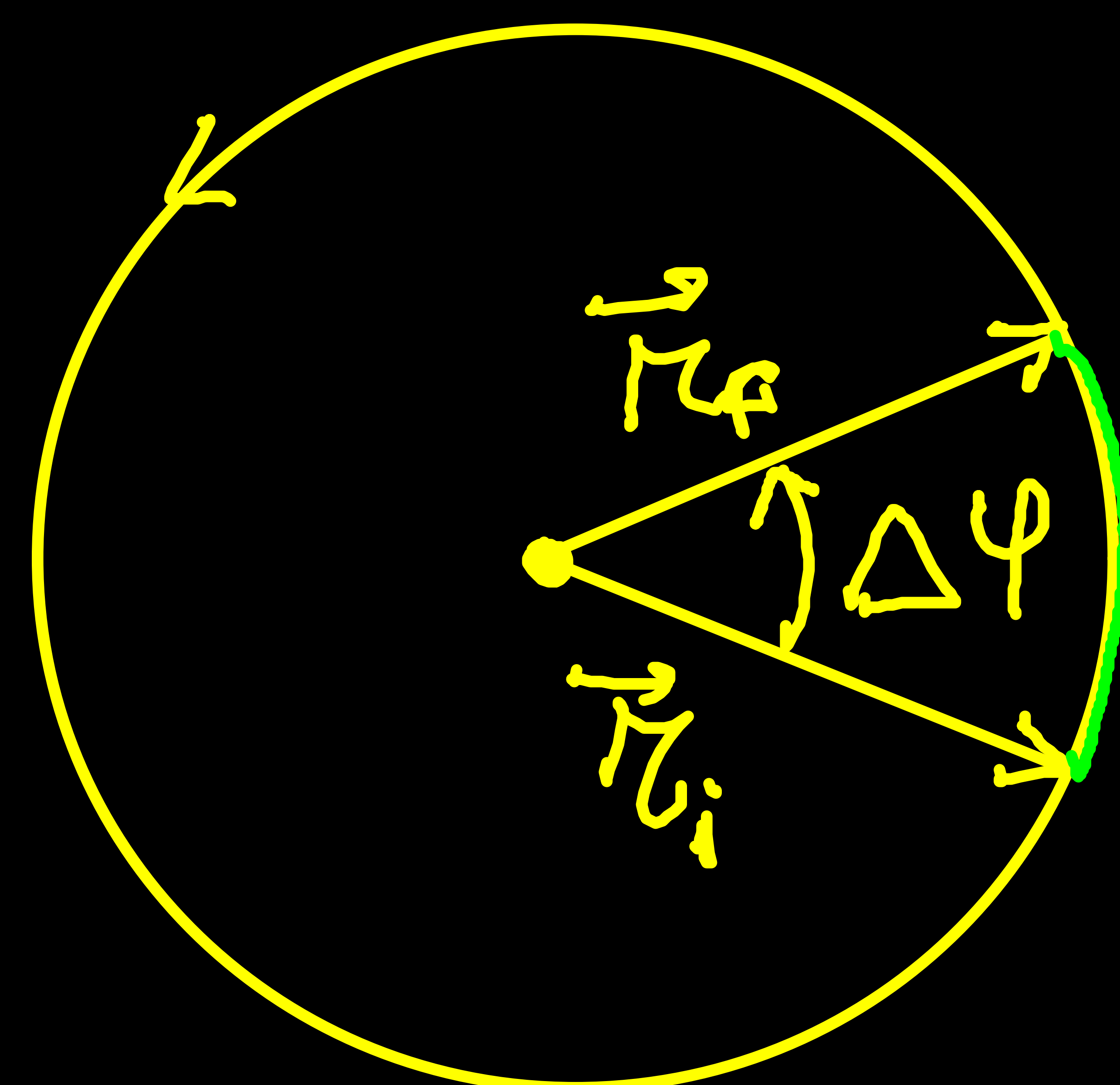
da simil. triangoli $\Delta \vec{r}$, $\Delta \vec{v}$

$$\boxed{\frac{|\Delta \vec{v}|}{v} = \frac{\Delta \vec{r}}{R}}$$

$$= \lim_{\Delta t \to 0} \frac{v \, |\Delta \vec{r}| / R}{\Delta t}$$

$$= \frac{v}{R} \lim_{\Delta t \to 0} \frac{|\Delta \vec{r}|}{\Delta t} = \frac{v^2}{R}$$

velocità angolare



$\Delta\varphi$

$$\lim_{\Delta t \to 0} \frac{\Delta\varphi}{\Delta t}$$

$$\omega \doteq \frac{d\varphi}{dt}$$

$\Delta\varphi$ in radianti

$$\Delta s = R\,\Delta\varphi$$

$\Delta t \to 0$

$$|d\vec{r}| = ds$$

$$d\varphi = \frac{ds}{R}$$

$$\omega = \frac{d\varphi}{dt} = \frac{1}{R}\underbrace{\frac{ds}{dt}}_{v}$$

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