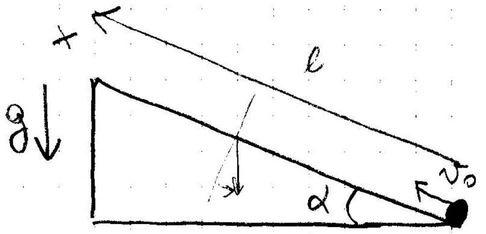
Esercizio della pallina sul piano inclinato



v_0 t.c. cada di sotto?
Data ℓ

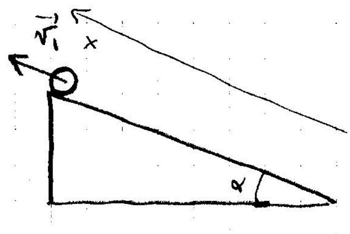
$$\vec{r} = \vec{r}_0 + \vec{v}_0 t + \frac{1}{2}\vec{g}\, t^2 \quad ; \quad \vec{v} = \vec{v}_0 + \vec{g} t$$

lungo x :
$$x = x_0 + v_0 t - \frac{1}{2} g \operatorname{sen}\alpha\, t^2$$
$$v_x = v_0 - g \operatorname{sen}\alpha\, t$$

t^* t.c. $v_x = 0 \Rightarrow \dfrac{v_0}{g \operatorname{sen}\alpha} = t^*$

$$\ell = \frac{v_0^2}{2g \operatorname{sen}\alpha} \Rightarrow v_0 \geq \sqrt{2g\ell \operatorname{sen}\alpha}$$

Supponiamo $v_0 > \sqrt{2g\ell \operatorname{sen}\alpha}$, dove cade la pallina?



Trovare v_1:

$x = v_0 t - \frac{1}{2} g \operatorname{sen}\alpha\, t^2$ $\qquad$ $\ell = v_0 t - \frac{1}{2} g \operatorname{sen}\alpha\, t^2 \Rightarrow$

$v_x = v_0 - g \operatorname{sen}\alpha\, t$

$$g \operatorname{sen}\alpha\, t^2 - 2 v_0 t + 2\ell = 0$$

$$t = \frac{v_0 \pm \sqrt{v_0^2 - 2\ell g \operatorname{sen}\alpha}}{g \operatorname{sen}\alpha}$$

$v_1 = v_0 - v_0 \mp \sqrt{v_0^2 - 2\ell g \operatorname{sen}\alpha}$
$= \mp \sqrt{v_0^2 - 2\ell g \operatorname{sen}\alpha}$

$\Rightarrow$ il segno giusto è "−" in t $\Rightarrow$