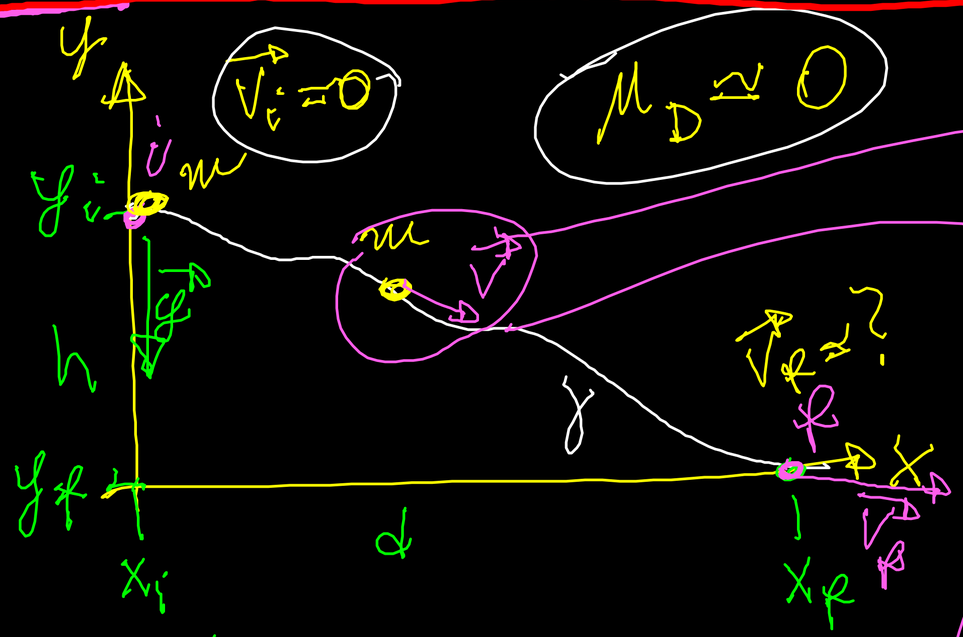
TEOREMA DELL'ENERGIA CINETICA

$$\mathcal{L}_{TOT} = K_f - K_i = \Delta K$$

$$K = \frac{1}{2} m V^2$$

$$\mathcal{L}_{TOT} = \sum_{i=1}^{n} \mathcal{L}_n = \sum_{i=1}^{n} \int_{i\gamma} \vec{F}_i(\vec{r})\, d\vec{r}$$



$$N \cos\alpha = mg$$
$$F_D = \mu_D N \cos\alpha$$
$$m a_t = mg \sin\alpha - \mu_D m \cos\alpha$$

$$\mathcal{L}_T = \Delta K = V_f^2 \frac{m}{2}$$

$$\mathcal{L}_T = \mathcal{L}_{FD} + \mathcal{L}_N + \mathcal{L}_P$$

$\vec{F}_D \perp d\vec{r} \Rightarrow \mathcal{L}_{FD} = 0$

$N \perp d\vec{r} \Rightarrow \mathcal{L}_N = 0$

$$\mathcal{L}_P = -mg(y_f - y_i) = mgh$$

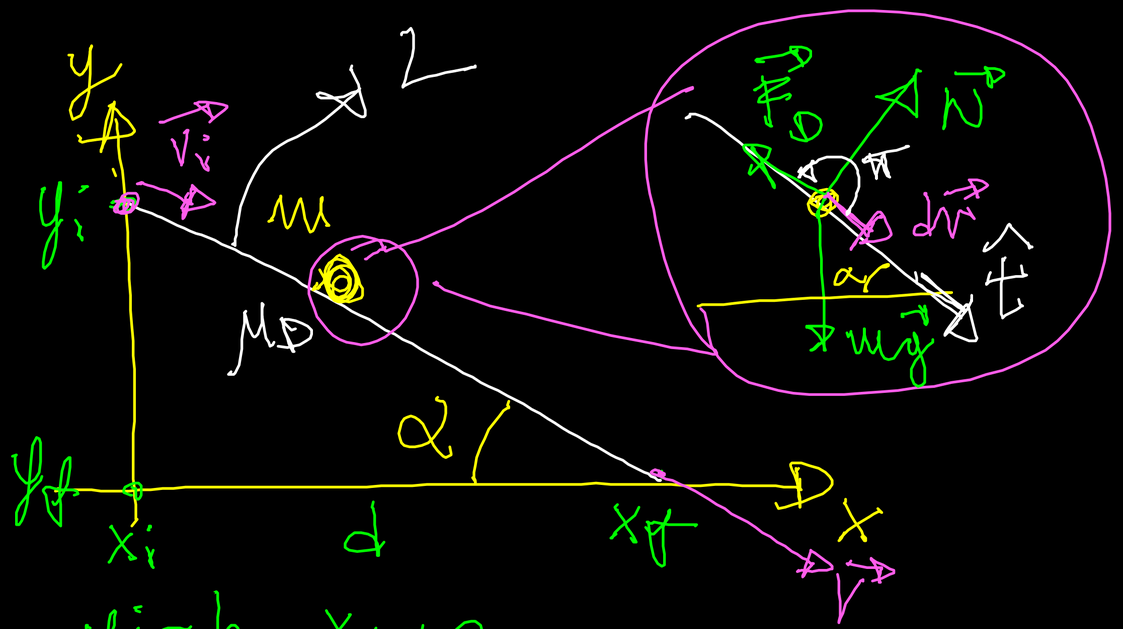
Se $\mu_D \simeq 0 \Rightarrow \mathcal{L}_{FD} \simeq 0$

$y_i = h \quad x_i = 0$

$y_f = 0 \quad x_f = d$

$$\mathcal{L}_{Tot} = \mathcal{L}_P = mgh = \frac{m}{2} V_f^2$$

$$V_f = \sqrt{2gh}$$



$y_i = h \quad x_i = 0$

$y_f = 0 \quad x_f = d$

$|\vec{v}_i| = v_0 \qquad |\vec{v}_f| = ?$

L = IPOTENUSA

$L \sin\alpha = h$

$$\mathcal{L}_T = \Delta K = \frac{1}{2} m \left(v_f^2 - v_i^2 \right)$$

$$\mathcal{L}_T = \mathcal{L}_{F_D} + \cancel{\mathcal{L}_N} + \mathcal{L}_P$$

$$\mathcal{L}_P = -mg(y_f - y_i) = mgh > 0$$

$$\mathcal{L}_{F_D} = \int \vec{F}_D \cdot d\vec{r} = \int (\mu_D m g \cos\alpha)\hat{t} \cdot d\vec{r}$$

$$= \mu_D m g \cos\alpha \int (-dr)$$

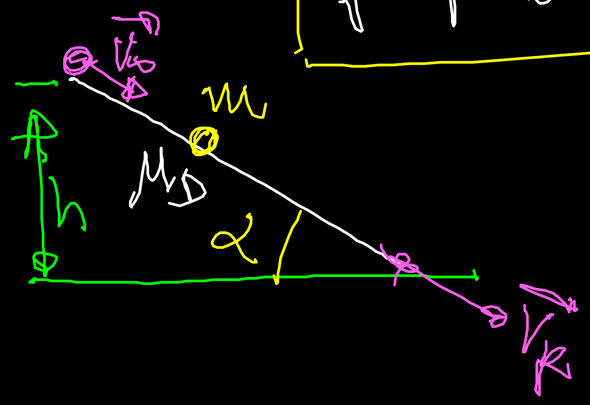
$-h = -L\sin\alpha$

$$= -\mu_D m g h \cot\alpha$$

ΔK $\quad$ $y_{PESO} > 0$ $\quad$ $y_{ATTRITO} < 0$

$$\frac{1}{2}m\left(v_f^2 - v_i^2\right) = mgh - \mu_D mgh\cot\alpha$$

$$v_f = \sqrt{2v_0^2 + 2gh\left(1 - \mu_D\cot\alpha\right)}$$



Se $\mu_D \simeq 0 \Rightarrow v_f = \sqrt{2gh}$

$v_0 \simeq 0$

Se $\mu_D \not\simeq 0$ $\quad$ $v_f = \sqrt{2gh\left(1 - \frac{\mu_D}{\tan\alpha}\right)} < \sqrt{2gh}$

$v_0 \simeq 0$

POTENZA

"POTENZA" = $\frac{\text{"LAVORO FATTO"}}{\text{"TEMPO PER FARLO"}}$

$kW \cdot h$ = "ENERGIA"

kW: POT. INST. — h: TEMPO DI UTILIZZO

$\xrightarrow[\text{IN } \Delta t]{\text{LAVORO}} \frac{\Delta \mathcal{L}}{\Delta t} = \langle P \rangle = \frac{[J]}{[s]} = [\text{WATT}] = [W]$

POTENZA MEDIA

POTENZA ISTANTANEA

$$P = \frac{d\mathcal{L}}{dt} = \frac{\vec{F} \cdot d\vec{r}}{dt} = \vec{F} \cdot \left(\frac{d\vec{r}}{dt}\right) = \vec{F} \cdot \vec{v}$$

PRINCIPIO DI CONSERVAZIONE DELL'ENERGIA