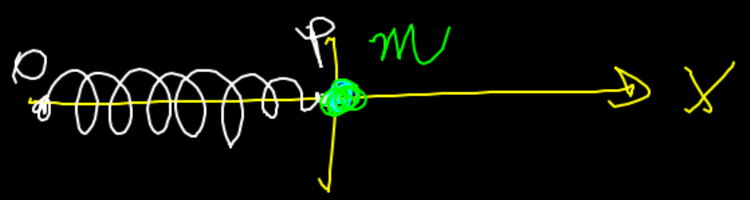
FORZA NON COSTANTE

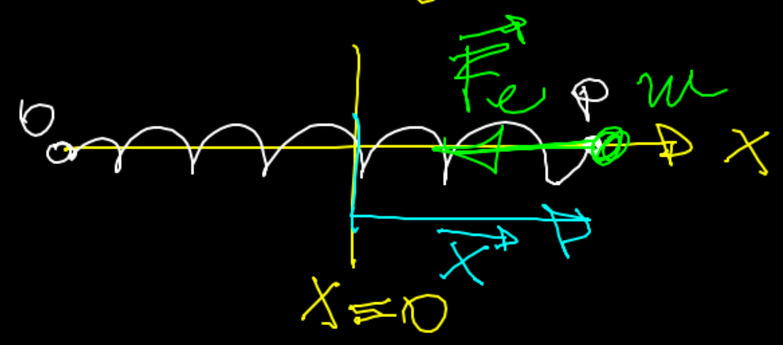
ES. MOLLA



RIPOSO

$\vec{F}_{el} = 0$

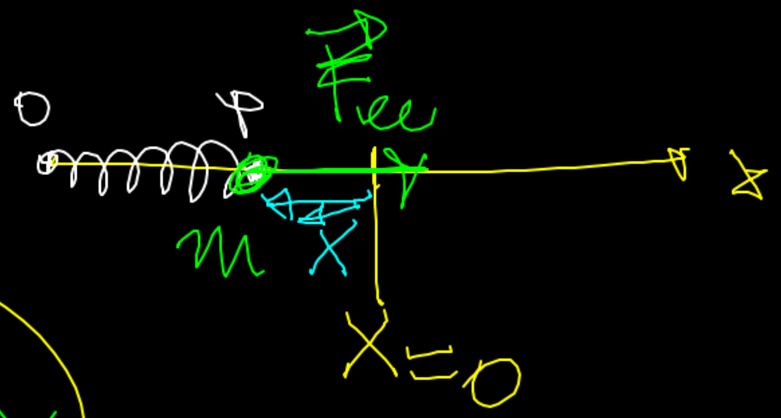
$x = 0$



ALLUNG.

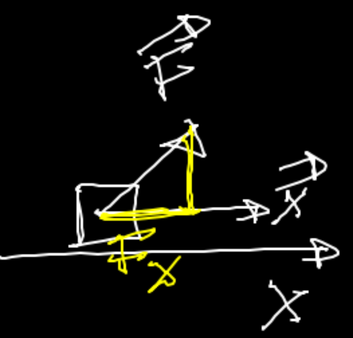
$\vec{F}_{el} = -K\vec{x}$

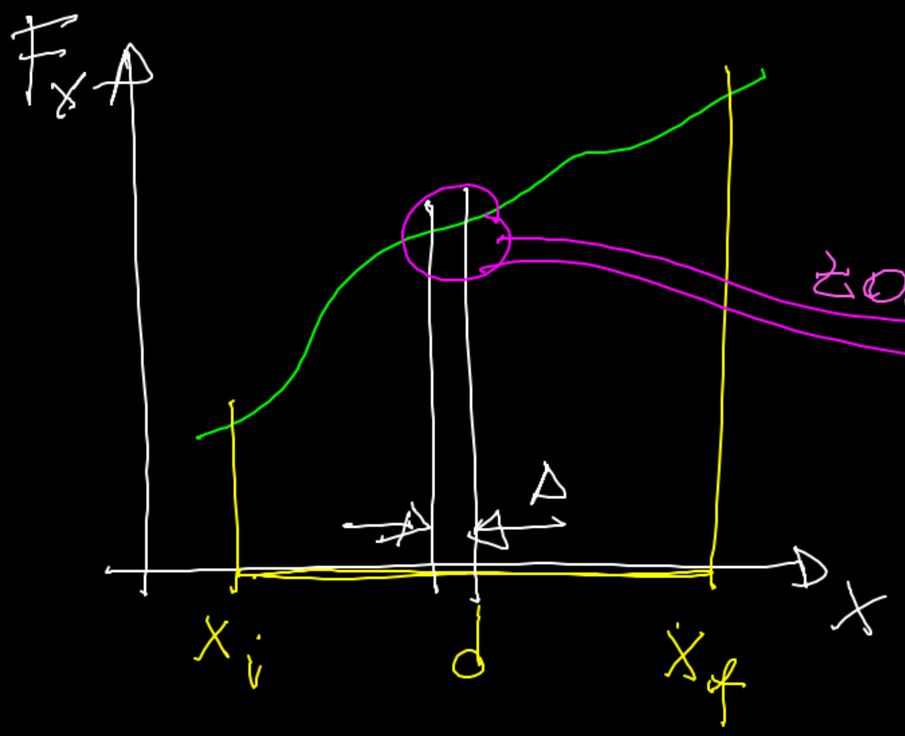
FORZA EL.



COMPRESS.

ALTRO ES.
↳ GRAVITÀ





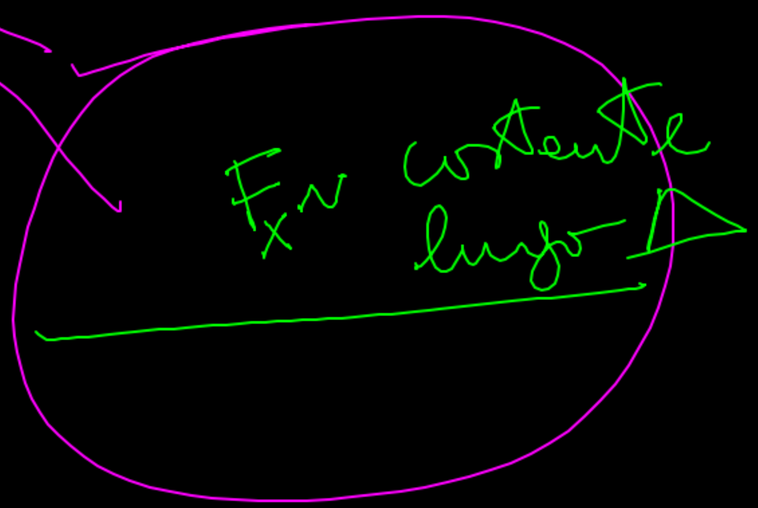
$$x_f - x_i = d$$

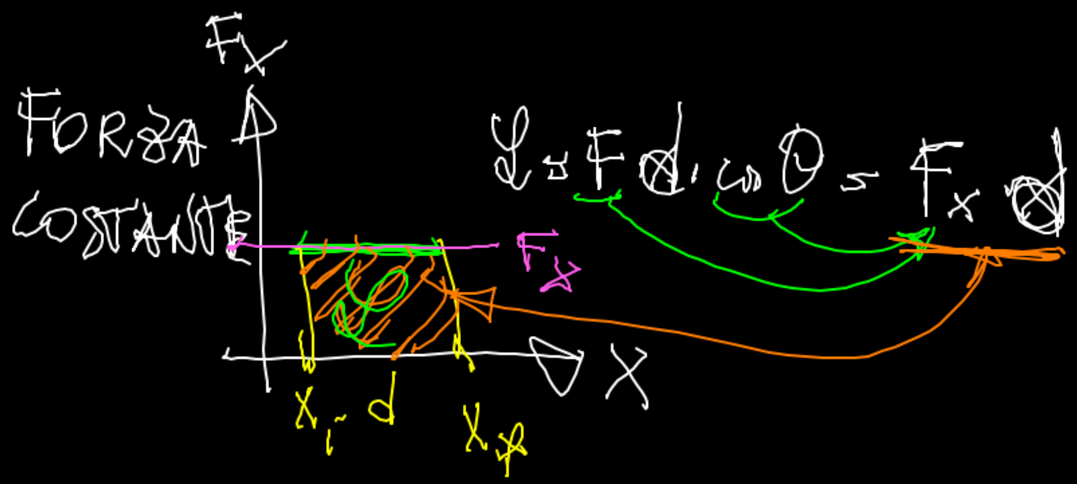
FORZA NON COSTANTE

ZOOM

$$\sum \Delta = d$$

$$\Delta << d$$

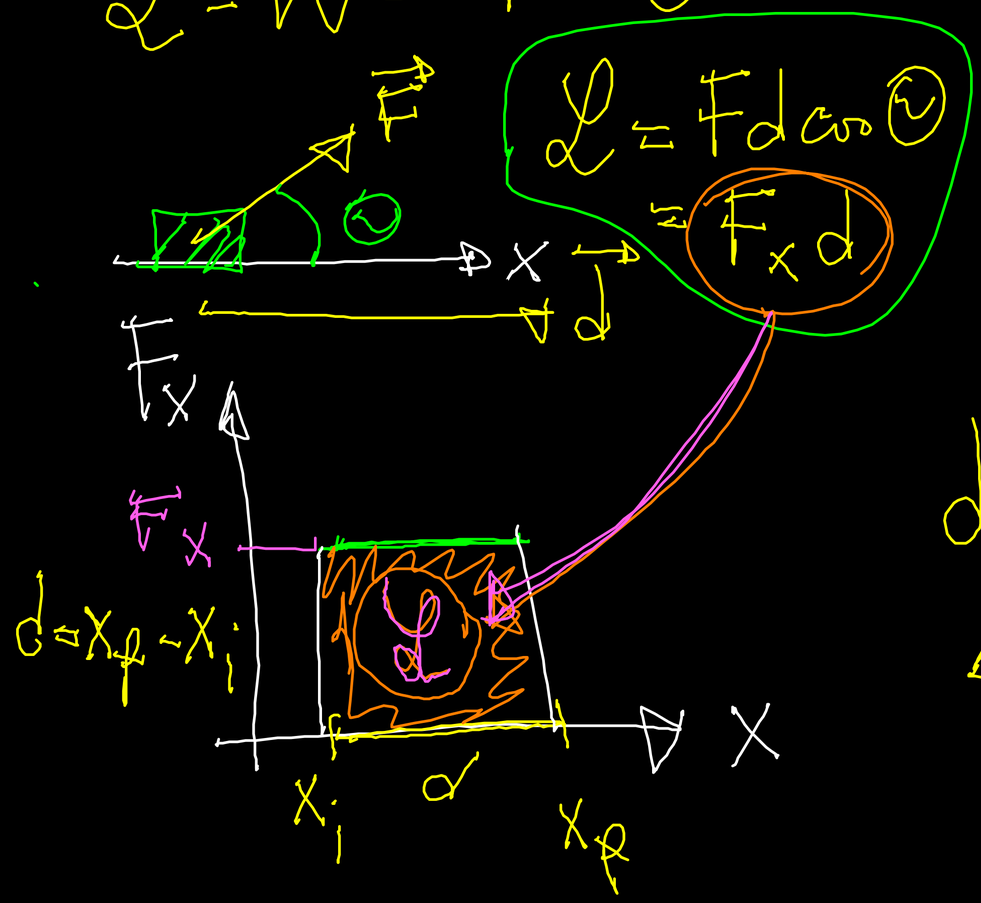




$$\mathcal{L} = F d \cdot \cos\theta = F_x d$$

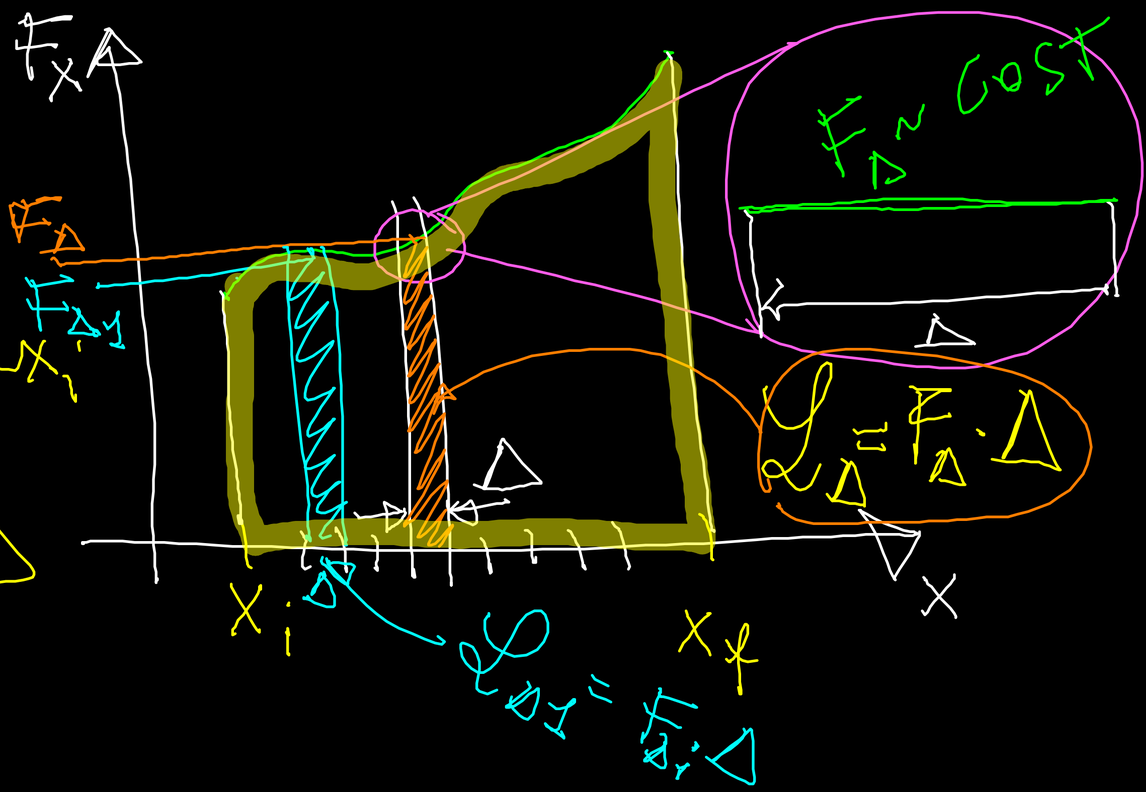
LAVORO PER $\vec{F}$ COSTANTE

$$\mathcal{L} = W = \vec{F} \cdot \vec{d}$$



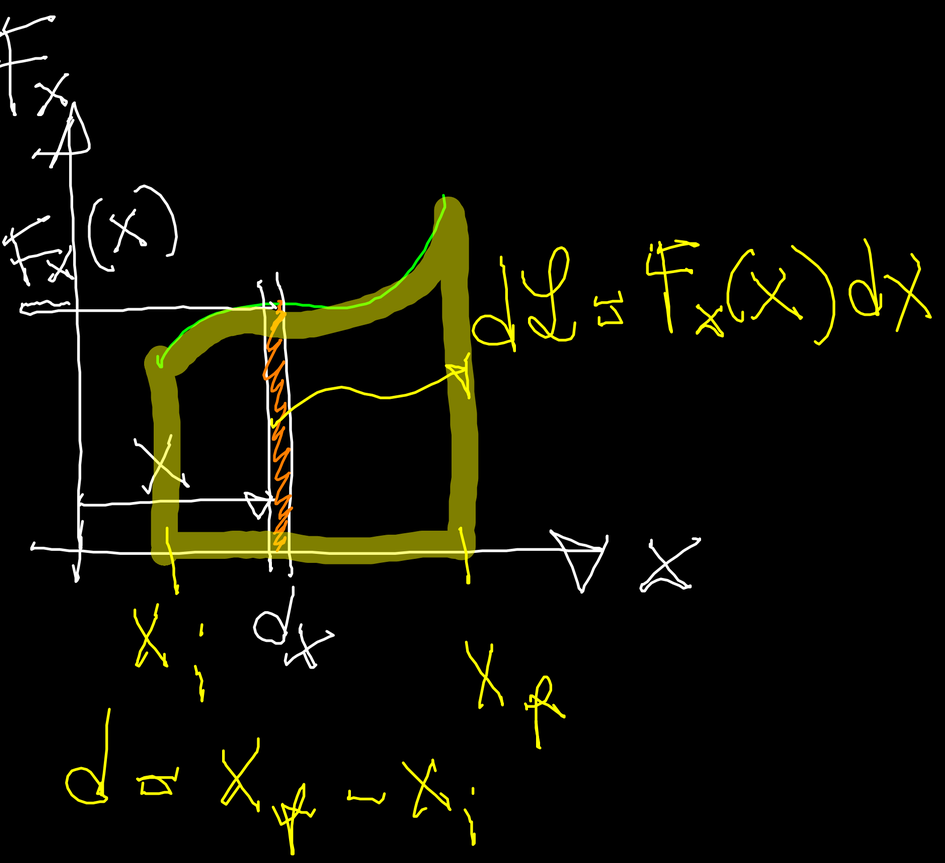
LAVORO PER $\vec{F}$ NON COSTANTE

$\mathcal{L} = ?$ ~~$F_x \cdot d$~~ (?)



$$\mathcal{L}_F = \lim_{\substack{\Delta \to 0 \\ i \to \infty}} \sum_i F_i \Delta \longrightarrow \mathcal{L}_F = \int_{x_i}^{x_f} F_x(x)\,dx$$

$\mathcal{L}_i$



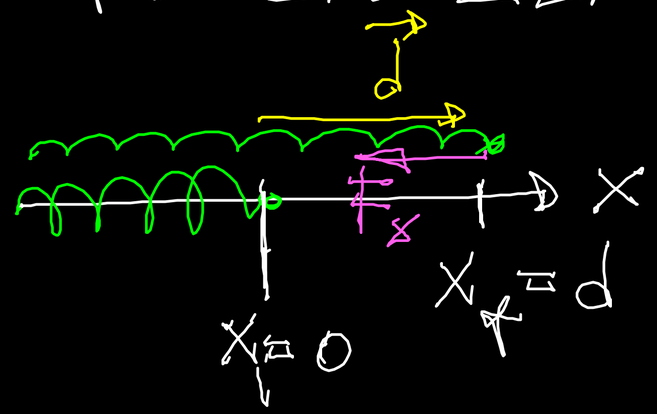
Se F_x è costante

$$\mathcal{L}_F = \int_{x_i}^{x_f} F_x\,dx = F_x \int_{x_i}^{x_f} dx = F_x(x_f - x_i)$$

$$x_i = F_x d$$

ESEMPIO CON $\vec{F}$ NON COSTANTE
(CASO UNIDIM.)

→ FORZA ELASTICA



$$F_x = -Kx$$

K → costante elastica

[N/m]

$$\mathcal{L}_F = \int_{x_i}^{x_f} F_x(x)\,dx$$

$$\mathcal{L}_{F_{el}} = \int_{x_i}^{x_f} -Kx\,dx =$$

AND $x_i = 0$, $x_f = d$

$$= -K \int_0^d x\,dx = -K\left[\frac{x^2}{2}\right] =$$

$$\mathcal{L}_{AND} = -\frac{Kd^2}{2}$$

$x_i = 0 \longrightarrow x_f = d$

$x_i = d \longrightarrow x_f = 0$ ⇒

$$\mathcal{L}_{RIT} = \frac{Kd^2}{2}$$