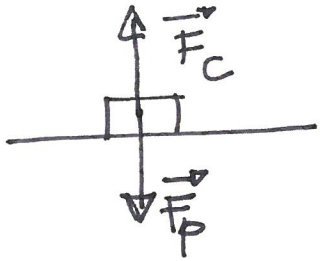
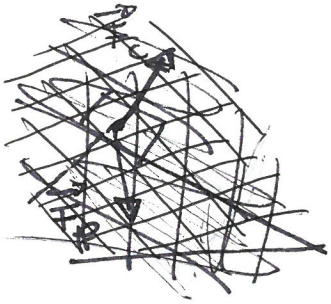
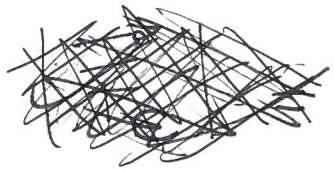
$\vec{F} = m\vec{g}$ FORZA PESO

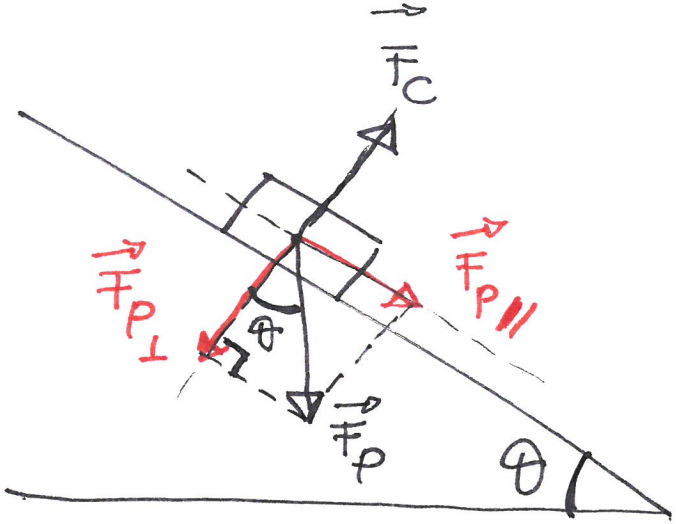


FORZA di CONTATTO / REAZIONE VINCOLARE

$|\vec{F}_C| = |\vec{F}_P|$ FORZA NORMALE

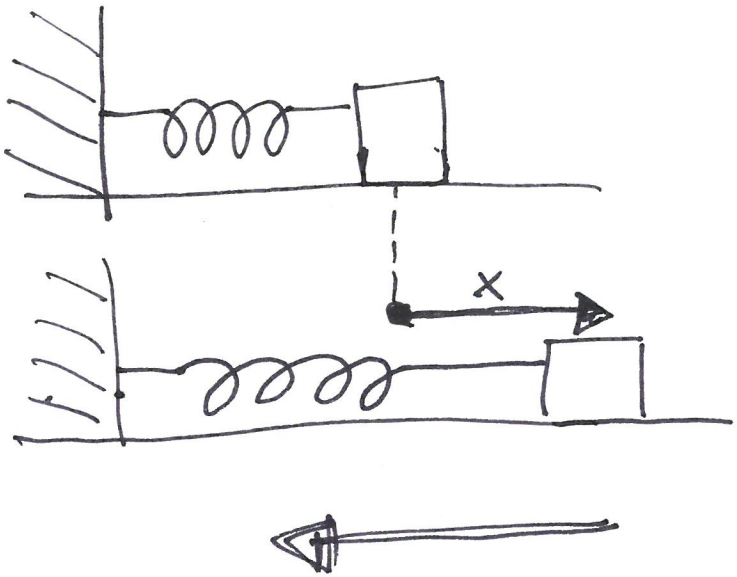






$|\vec{F}_C| = |\vec{F}_{P\perp}| = F_P \cos\vartheta$

FORZA ELASTICA



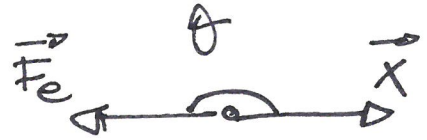
$$\vec{F}_e = -k\vec{x}$$

COSTANTE ELASTICA

$$N = k \cdot m \rightarrow k = \left[\frac{N}{m}\right]$$

$$L = -\Delta U$$

$$L = \vec{F} \cdot \vec{S} = \vec{F}_e \cdot \vec{x}$$



$$dL = \vec{F}_e \cdot d\vec{x} = F_e \cdot dx \cos\theta = F_e \cdot dx \cdot \cos\pi = -F_e\, dx$$

$$dL = -kx \cdot dx \rightarrow \int dL = \int_0^S -kx\, dx = -k\int_0^S x\, dx = -k \cdot \frac{1}{2}x^2 = -\frac{1}{2}kx^2$$

$$L = -\frac{1}{2}ks^2$$

$$X = 0$$

$$X = s$$

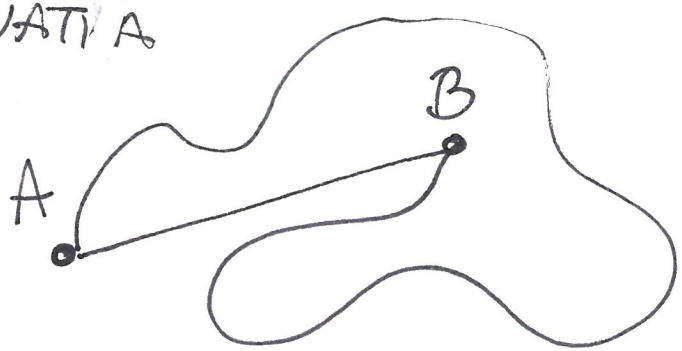
$$L = -\Delta U = -(U_f - U_i) = U_i - U_f$$

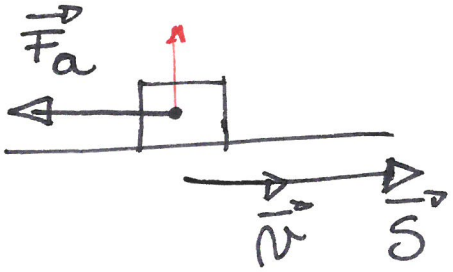
$$-\frac{1}{2}ks^2 = -U_f \longrightarrow \boxed{U = \frac{1}{2}ks^2}$$

$$\frac{N}{m} \cdot m^2 = [N \cdot m] = [J]$$

FORZA D'ATTRITO

NON CONSERVATIVA





- STATICO
- DINAMICO
  - RADENTE
  - VISCOSO

$$F_a = \mu_k F_c$$

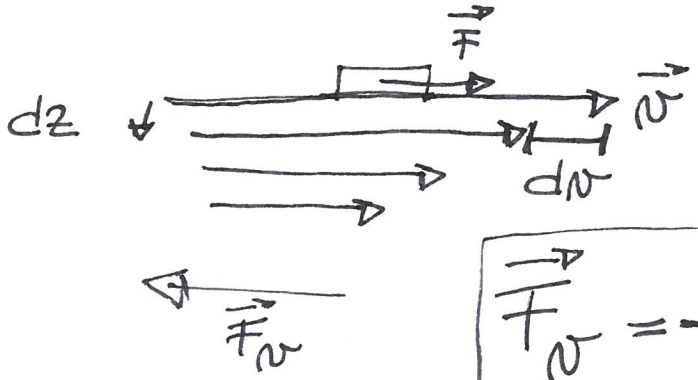
COEFF. STATICO

$$\vec{F}_a = -\mu_k F_c \hat{v}$$

$\mu_k > \mu_d$

↘ COEFF. DINAMICO

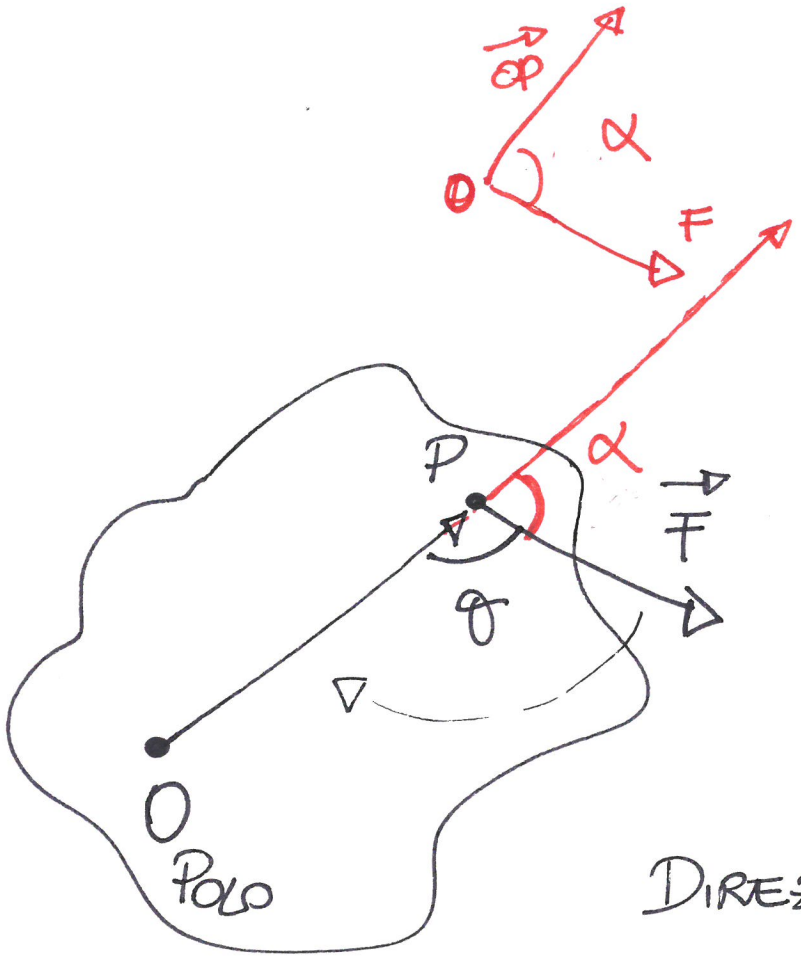
$$F_a = \mu_d F_c$$



$$\vec{F}_v = -\eta A \frac{dv}{dz} \hat{v}$$

EQUILIBRIO TRASLAZIONALE

$$\sum_{i=1}^{N} \vec{F}_i = 0$$



$$\vec{M} = \vec{OP} \times \vec{F}$$

$M = OP \cdot F \cdot \sin\theta$ MODULO

$\alpha = \pi - \theta$ $\sin\theta = \sin(\pi - \theta)$

DIREZIONE $\perp$ PIANO FORMATO DA $\vec{OP}$ e $\vec{F}$

VERSO ENTRANTE (MANO DX)

⊗ ENTRANTE

⊙ USCENTE

PROD. VET. ANTI COMMUTATIVO (cambia verso)

ESERCIZIO 6

$m = 900\ kg$ $\quad v_i = 72\ km/h$ $\quad v_f = 0$

fermare l'auto in $s = 30\ m$ quale F devo applicare?

$$\Delta E_k = L_{TOT}$$

$$\cancel{\frac{1}{2} m v_f^2} - \frac{1}{2} m v_i^2 = \vec{F} \cdot \vec{s}$$

$$-\frac{1}{2} m v_i^2 = F \cdot s \quad (\cos \pi = -1)$$

$$-\frac{1}{2} m v_i^2 = -F \cdot s$$

$$F = \frac{m v_i^2}{2s} = \frac{(900\ kg)(20\ m/s)^2}{2 \cdot (30\ m)} =$$

$$= 6000\ kg\ \frac{m^2}{s^2} \cdot \frac{1}{m} = 6000\ N$$

$$72\ \frac{km}{h} = 72 \cdot \frac{10^3}{3{,}6 \cdot 10^3}\ \frac{m}{s}$$

$$= 72 \cdot \frac{1}{3{,}6}\ \frac{m}{s}$$

$$3600\ s = 3{,}6 \cdot 10^3\ s$$

$$\begin{cases} S = S_0 + v_0 t \mp \frac{1}{2} a t^2 \\ v = v_0 \mp a t \end{cases} \qquad \begin{cases} S = v_i t - \frac{1}{2} a t^2 \\ 0 = v_i - a t \end{cases}$$

$a = ?$

$F = ma$