$$\Delta \vec{p} = \vec{F} \cdot \Delta t$$

$$\vec{p} = m \cdot \vec{v}$$

$$d\vec{p} = \vec{F}(t)\, dt$$

$$d\vec{p} = m\, d\vec{v}$$

$$m\, d\vec{v} = \vec{F}\, dt$$

$$m \frac{d\vec{v}}{dt} = \vec{F} \Rightarrow \vec{a} = \vec{F}/m$$

3) $$\vec{F}_A^{(B)} = -\vec{F}_B^{(A)}$$

$$\vec{a}_A = \vec{F}_A^{(B)} / m_A \qquad \vec{a}_B = \vec{F}_B^{(A)} / m_B$$

$$\vec{a} = \vec{F}/m$$

$$\vec{F} = 0 \Rightarrow \vec{a} = 0 \Rightarrow \vec{v} = \text{cost}$$

$$\Delta\vec{p}\Big|_{t_1}^{t_2} = \int_{t_1}^{t_2} \vec{F}(t)\,dt$$

$$\boxed{\Rightarrow \Delta p_x\Big|_{t_1}^{t_2} = \int_{t_1}^{t_2} F_x(t)\,dt \quad \text{etc.}}$$

$$\Delta\vec{p}\Big|_{t_1}^{t_2} = \vec{I}\Big|_{t_1}^{t_2}$$

impulso della $F_{extra}$

Var. q. m.

variazione

# Lavoro 1D

$F_x$ costante $\Rightarrow L = F_x \cdot \Delta x$

$$dL = F_x \, dx$$

$$L\Big|_{x_1}^{x_2} = \int_{x_1}^{x_2} F_x(x) \, dx$$

$$L = L^{(x)} + L^{(y)} + L^{(z)}$$

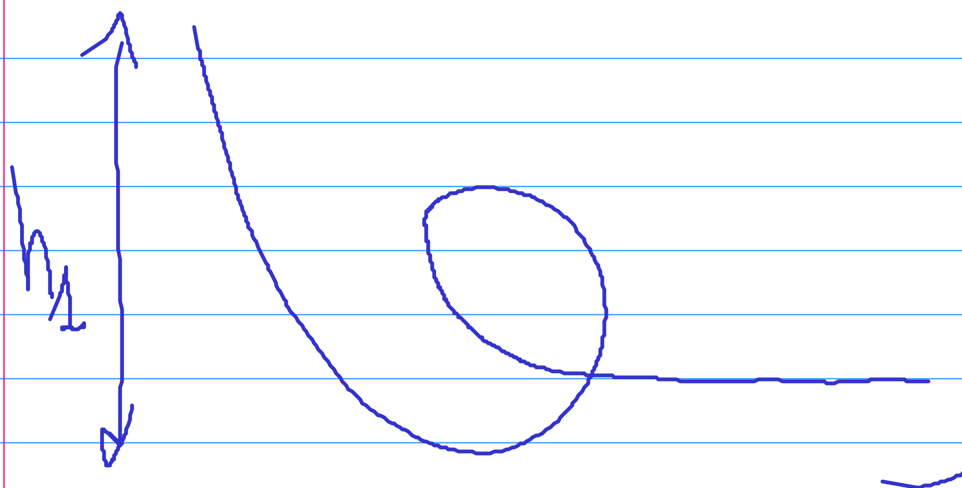
$$dL = dL^{(x)} + dL^{(y)} + dL^{(z)}$$

$$dL = F_x \, dx + F_y \, dy + F_z \, dz$$

$$\left[ a_x \cdot b_x + a_y \cdot b_y + a_z \cdot b_z = \vec{a} \cdot \vec{b} \right]$$

$$dL = \vec{F} \cdot d\vec{s} \Rightarrow L\Big|_{P_1}^{P_2} = \int_{P_1}^{P_2} \vec{F} \, d\vec{s}$$

$$\Delta E_c \Big|_{P_1}^{P_2} = L \Big|_{P_1}^{P_2} = \ldots$$




$$L^{(G)} = mg\,\Delta h$$

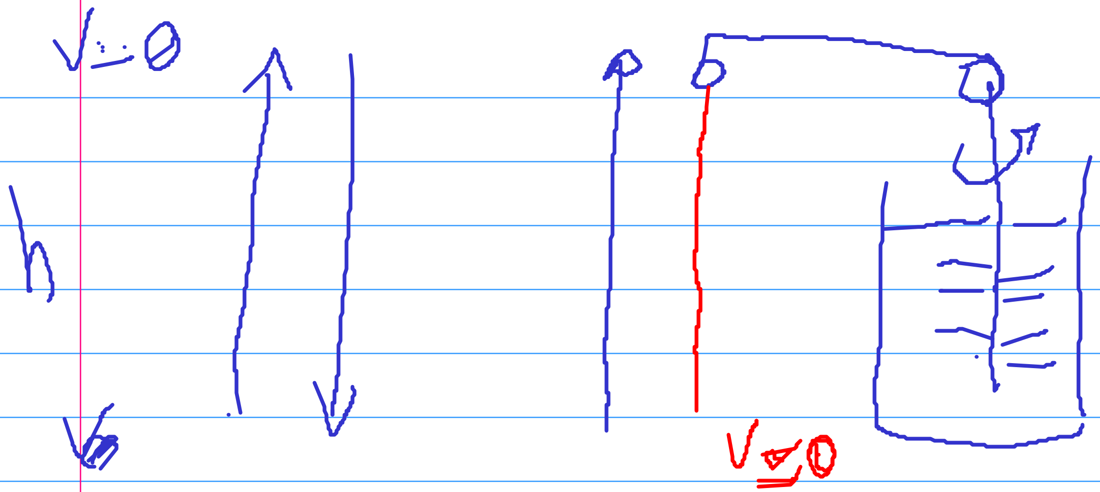
$$L^{(A)} = \ldots ?$$

$$E_c(P_2) - E_c(P_1)$$

Forze conservative

$$L = (-mg)\cdot h + (mg \cdot h)$$

$$= 0$$




# Joule

$$\Delta E_p \Big|_{P_1}^{P_2} = -L^{(c)} \Big|_{P_1}^{P_2} = -\Delta E_c^{(c)} \Big|_{P_1}^{P_2}$$

1D: $$\Delta E_p \Big|_{x_1}^{x_2} = -\int_{x_1}^{x_2} F_x \, dx$$

$$\Delta E_p \Big|_{x_1}^{x_2} = - \int_{x_1}^{x_2} F_x \, dx$$

$$E_p(x) \longrightarrow F_x = - \frac{dE_p}{dx}$$

$\Rightarrow$ OFFSET in $E_p$ irrelevant!?