$$\boxed{\bar{F} = \frac{d\bar{p}}{dt}} \qquad \bar{p} = m\bar{v}$$

$$\int_{\bar{p}_0}^{\bar{p}(t)} d\bar{p} = \int_0^t \bar{F}(t)\,dt$$

$$\bar{p}_0 = m\,\bar{v}(t=0)$$

$$\bar{p}(t) = m\,\bar{v}(t)$$

$$\boxed{\Delta\bar{p} = \bar{p}(t) - \bar{p}_0 = \int_0^t \bar{F}(t)\,dt = \bar{J}}$$

$\bar{J}$: impulso della forza

Teorema dell'impulso

$$\bar{F}(t) = \cos t \Rightarrow \Delta\bar{p} = \bar{F}\Delta t$$

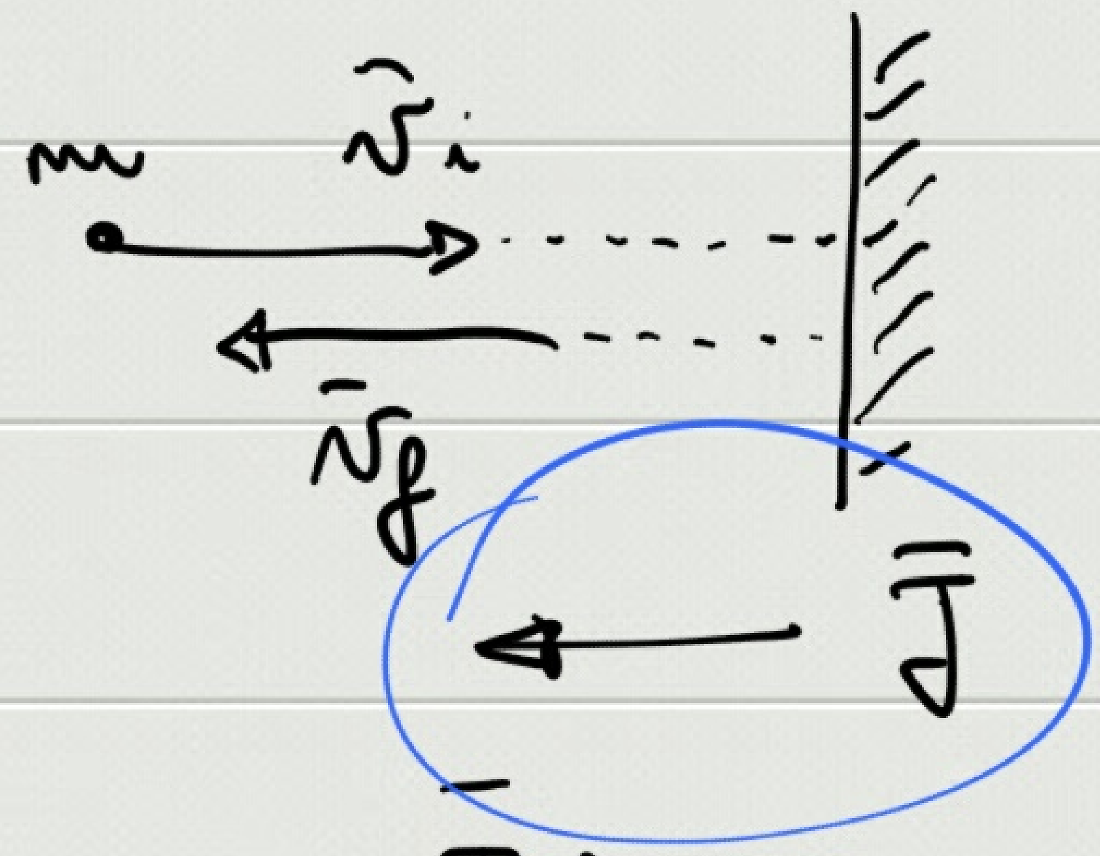
$$\Rightarrow m\Delta\bar{v} = \bar{F}\Delta t \Rightarrow \boxed{\Delta\bar{v} = \frac{\bar{F}\Delta t}{m}}$$

$$\Delta\bar{p} = m\Delta\bar{v} = \int_0^{\Delta t} \bar{F}(t)\,dt \Rightarrow \Delta\bar{v} = \frac{1}{m}\int_0^{\Delta t} \bar{F}(t)\,dt$$

$$f(t) \quad : \quad \langle f(t) \rangle_{\Delta t} = \frac{1}{\Delta t} \int_t^{t+\Delta t} f(t)\, dt$$

$$\langle \bar{F}(t) \rangle_{\Delta t} = \frac{1}{\Delta t} \int_t^{t+\Delta t} \bar{F}(t)\, dt = \frac{\bar{J}}{\Delta t} = \frac{\Delta \bar{p}}{\Delta t} = \frac{m \Delta \bar{v}}{\Delta t}$$

$$[J] = [p] = \underline{N\,s} = kg\, m\, s^{-2} \cdot s = \underline{kg\, m\, s^{-1}}$$



$m = 0.01\ kg$

$v_i = 2\ m/s$

$\Delta t = 10^{-4}\ s$

$|\bar{v}_f| = |\bar{v}_i|$

$\Longrightarrow \bar{v}_f = -\bar{v}_i$

$\Delta \bar{p}, \quad \langle F \rangle_{\Delta t}$

$$\Delta \bar{p} = \bar{p}_f - \bar{p}_i = m(\bar{v}_f - \bar{v}_i) = -2m\bar{v}_i = \bar{J}$$

$$|\Delta \bar{p}| = 0.04\ N\,s$$

$$\langle \bar{F} \rangle_{\Delta t} = \frac{\Delta \bar{p}}{\Delta t} \qquad |\langle \bar{F} \rangle_{\Delta t}| = 400\ N$$