Lezione martedì 15 settembre 2020

martedì 15 settembre 2020 15:14

- IERI

- VETTORE POSIZIONE } PUNTO
- VELOCITA'

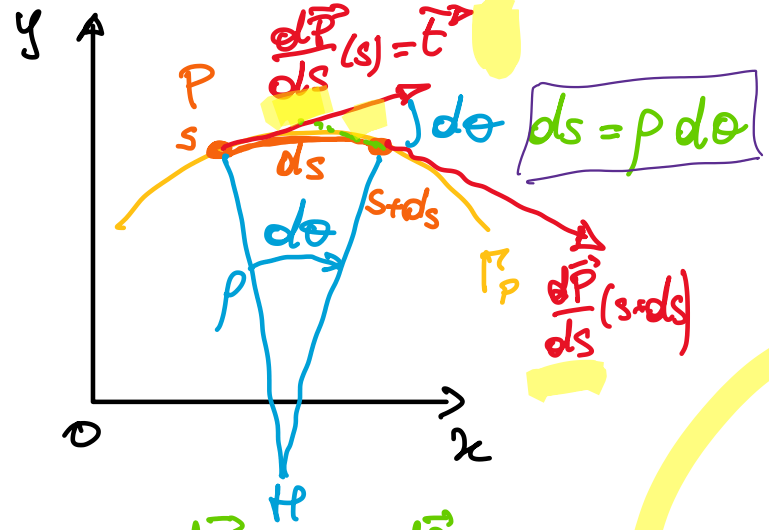
- ACCELERAZIONE

DEF: $\vec{a} = \frac{d\vec{v}}{dt} = \frac{d}{dt}\left[\frac{d\vec{P}}{dt}\right]$

$\vec{a} = \frac{d}{dt}\left(\frac{d\vec{P}}{ds}\frac{ds}{dt}\right)$

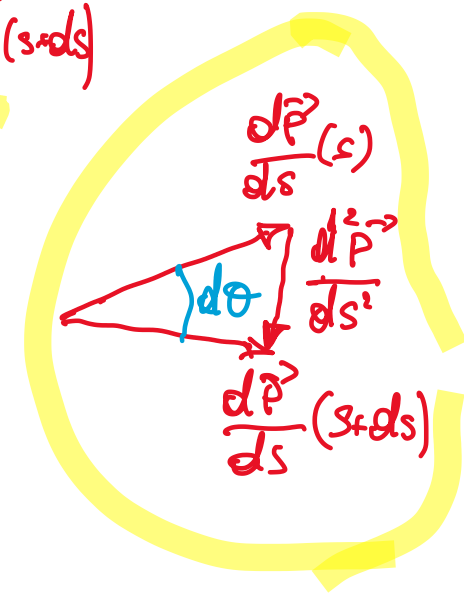
$\vec{a} = \left[\frac{d\vec{P}}{ds}\right]\left[\frac{d^2s}{dt^2}\right] + \left[\frac{d^2\vec{P}}{ds^2}\right]\left(\frac{ds}{dt}\frac{ds}{dt}\right)$

$\vec{t}$ $\quad \ddot{s}$ $\quad \frac{1}{\rho}\vec{n}$ $\quad \dot{s}\cdot\dot{s} = \dot{s}^2$



$\left|\frac{d^2\vec{P}}{ds^2}\right| = \left|\lim_{\Delta s \to 0} \frac{\frac{d\vec{P}}{ds}(s+\Delta s) - \frac{d\vec{P}}{ds}(s)}{\Delta s}\right| =$

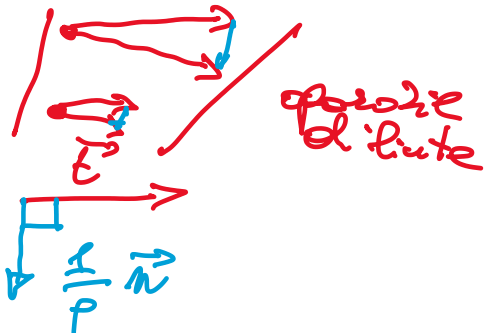
$= \frac{d\theta}{ds} = \frac{1}{\rho}$



1° MODO

$\vec{a} = \left[\ddot{s}\,\vec{t}\right] + \left[\frac{\dot{s}^2}{\rho}\vec{n}\right]$ 2 componenti distinte

$\vec{a} = \vec{a}_t + \vec{a}_n$



ATTENZIONE: $\vec{a}_t$ ∃ se $\ddot{s} \neq 0$

se $\vec{v}$ = costante $\Rightarrow$ $\vec{a}_t = 0$

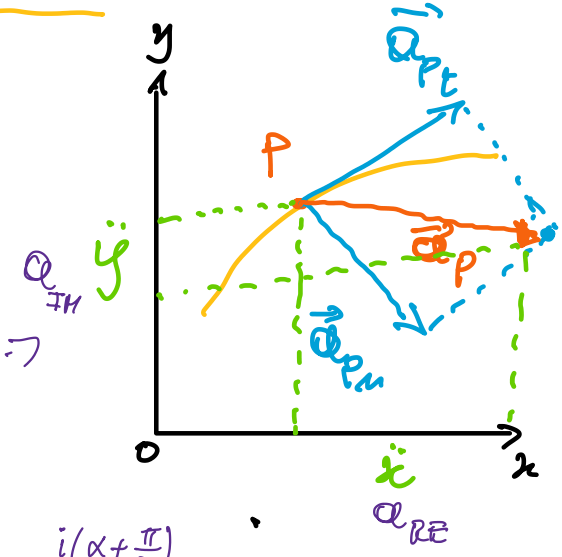
$\vec{a}_n$ ∃ se $\rho < \infty$

se $\rho \to \infty \to \frac{1}{\rho} = 0 \Rightarrow \vec{a}_n = 0$

↳ traiettoria rettilinea

2° MODO RAPPRESENTAZIONE CARTESIANA

$$\vec{a} = \frac{d\vec{v}}{dt} = \frac{d}{dt}\left(\dot{x}\vec{i} + \dot{y}\vec{j}\right) = \ddot{x}(t)\vec{i} + \ddot{y}(t)\vec{j}$$



3° MODO RAPPRESENTAZIONE NEL PIANO DI GAUSS

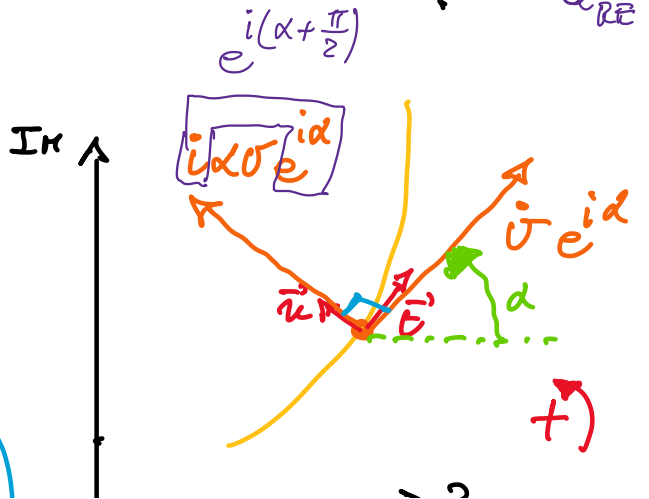
$$\vec{a} = \vec{a}_{RE} + i\,a_{IM}$$

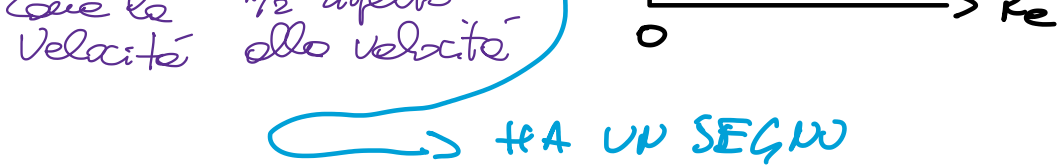
4° MODO NOTAZIONE POLARE

$$\vec{a} = \frac{d\vec{v}}{dt} = \frac{d}{dt}\left(ve^{i\alpha}\right) = \dot{v}e^{i\alpha} + i\dot{\alpha}ve^{i\alpha}$$

$\dot{v}e^{i\alpha}$: diretta come $\vec{v}$

$i\dot{\alpha}ve^{i\alpha}$: ruotata di $\frac{\pi}{2}$ rispetto a $\vec{v}$





Velocità

½ impulso della velocità

HA UN SEGNO