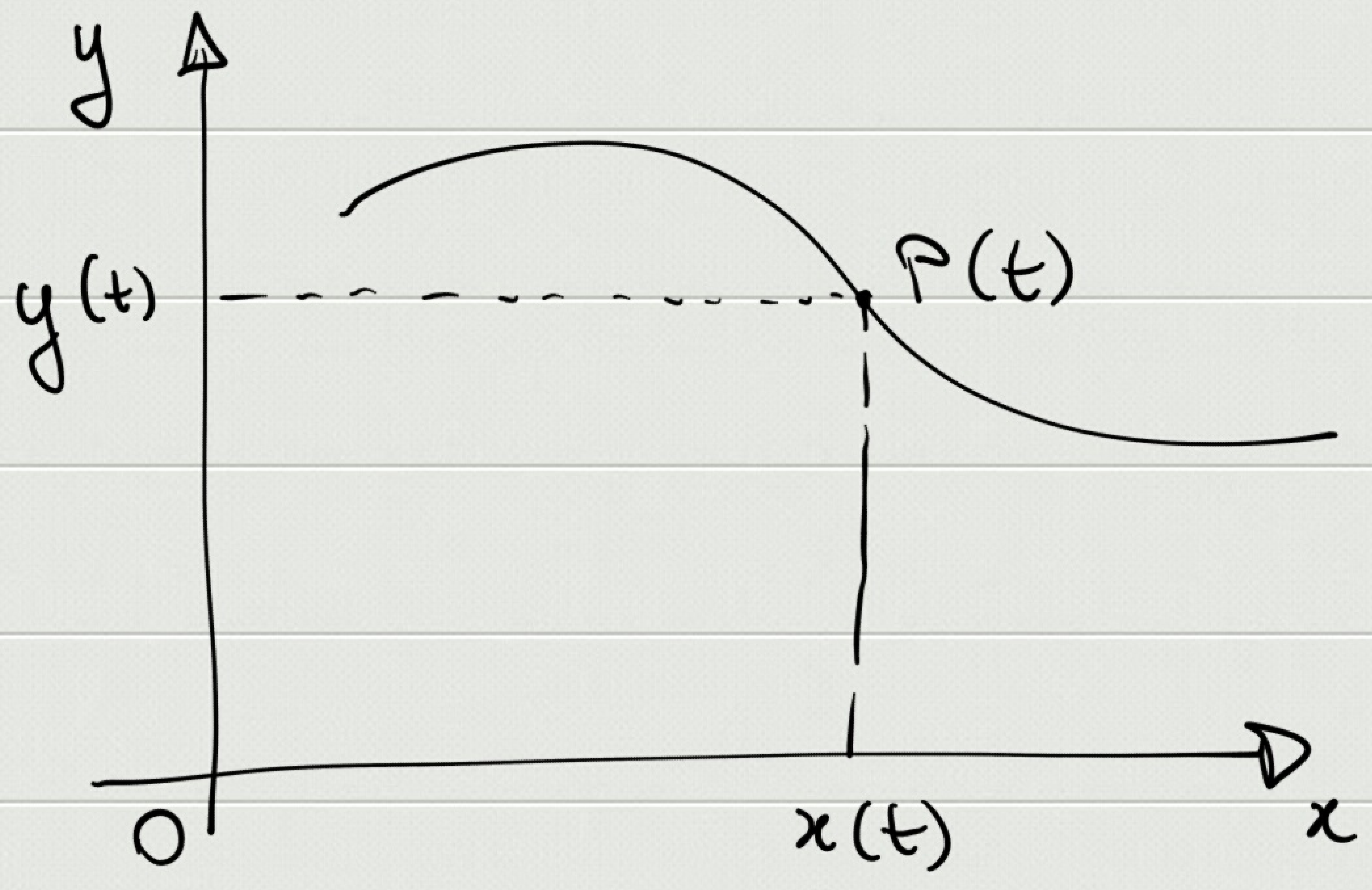
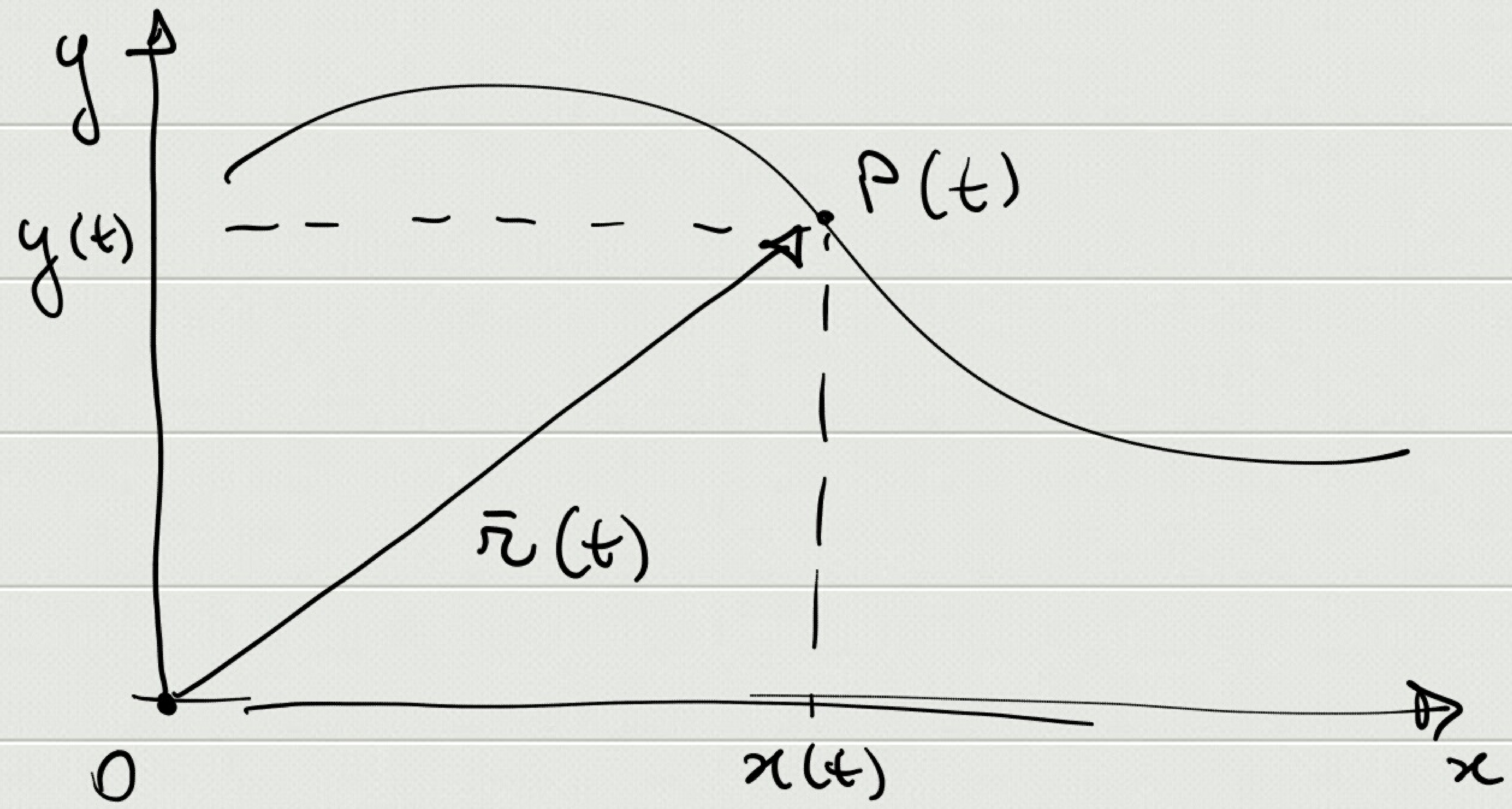
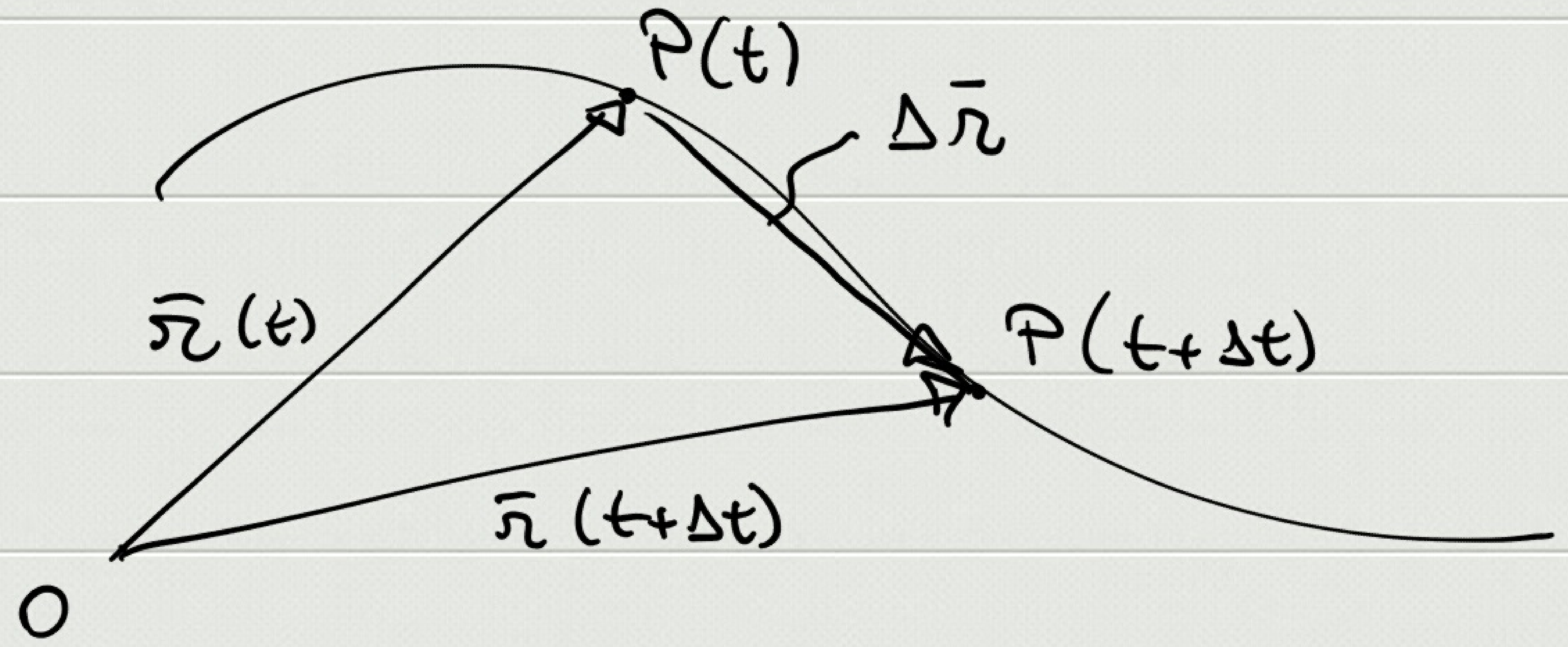
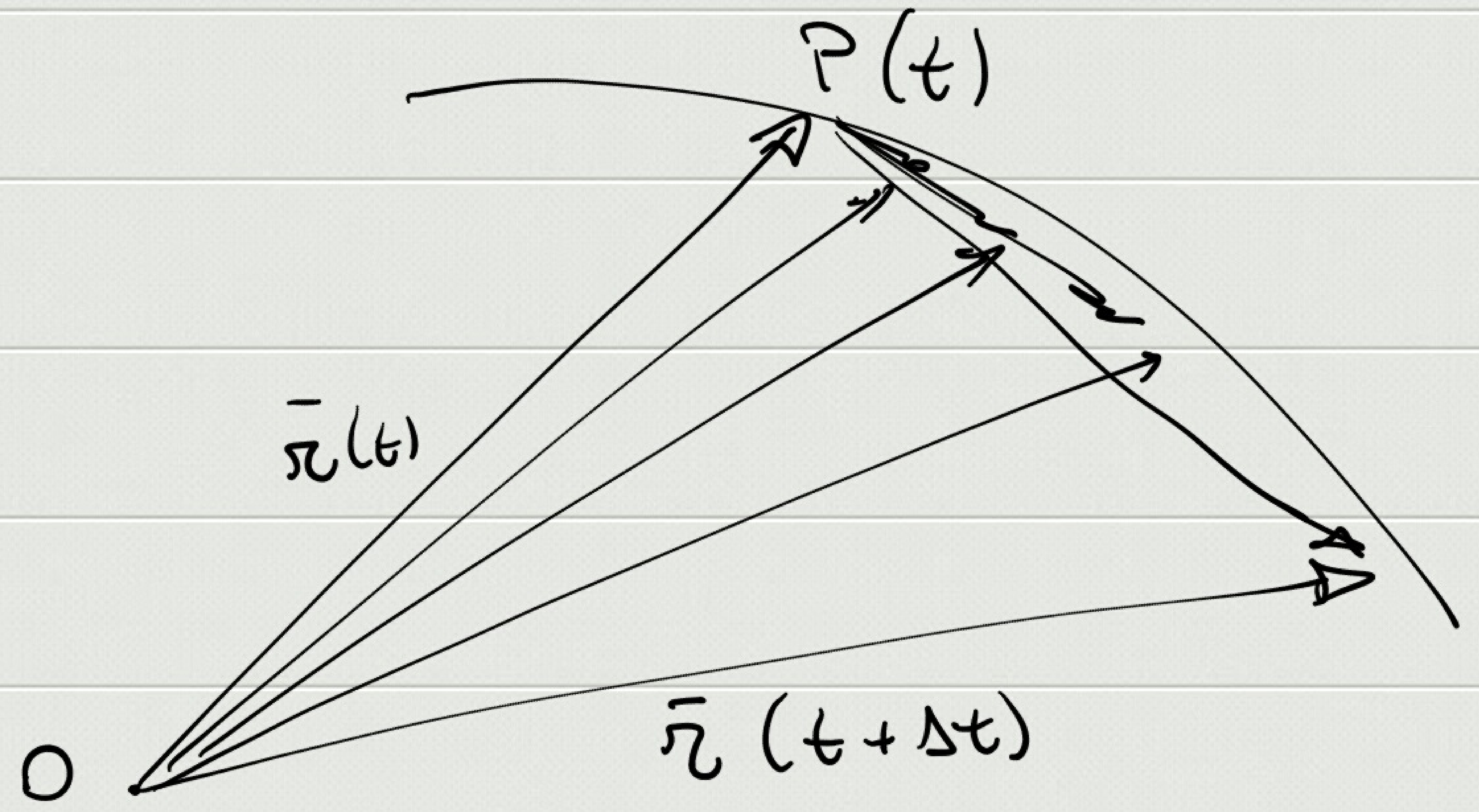




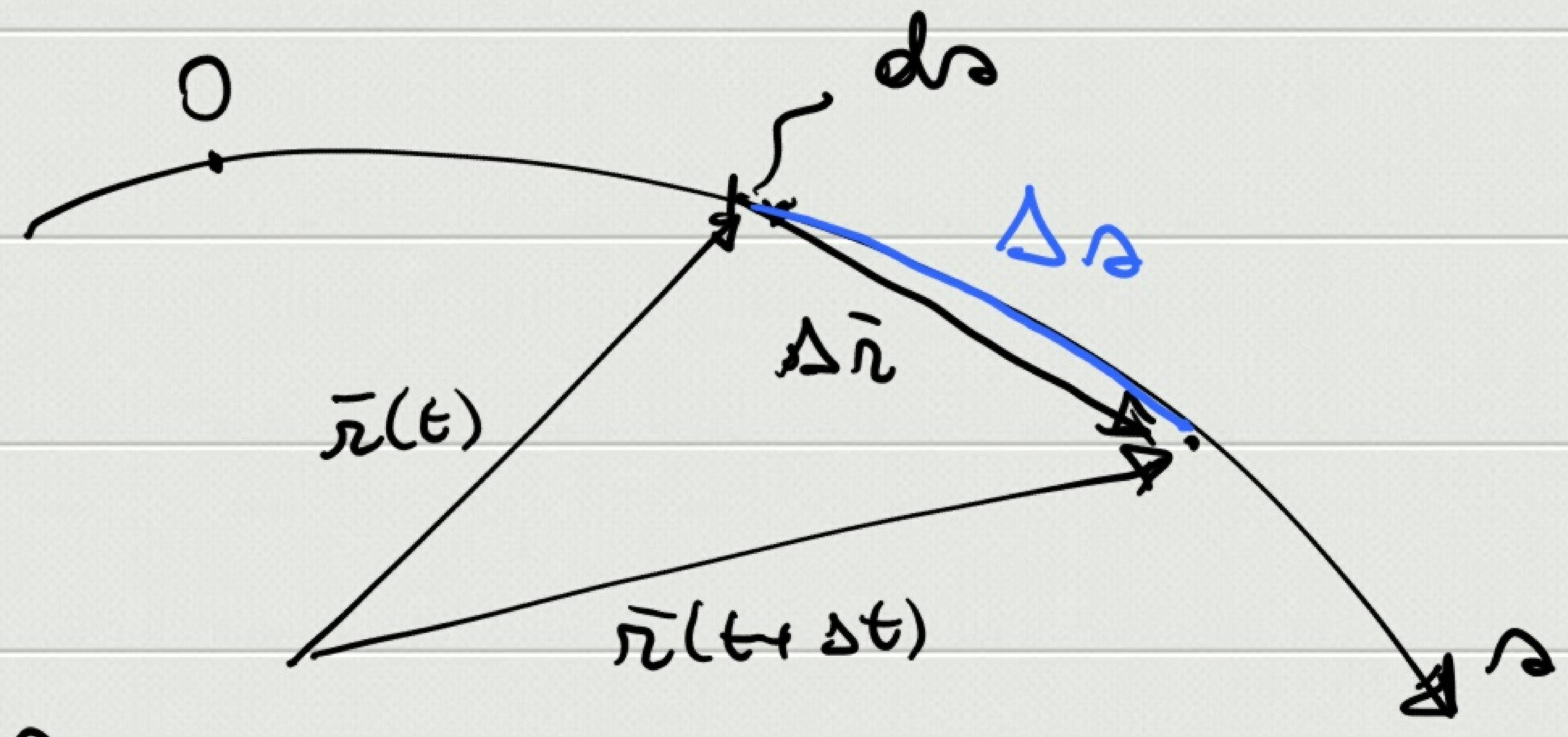
$$\boxed{\bar{r}(t) = x(t)\,\bar{u}_x + y(t)\,\bar{u}_y}$$



$$\boxed{\bar{v}_m = \frac{\Delta \bar{r}}{\Delta t}}$$



$$\boxed{\begin{aligned}\bar{v}(t) &= \lim_{\Delta t \to 0} \frac{\bar{r}(t+\Delta t) - \bar{r}(t)}{\Delta t} = \\ &= \lim_{\Delta t \to 0} \frac{\Delta \bar{r}}{\Delta t} = \frac{d\bar{r}}{dt}\end{aligned}}$$



$$v = \frac{ds}{dt}$$

$$\cancel{|\Delta \bar{r}| = \Delta s}$$

$$dr = \lim_{\Delta t \to 0} |\Delta \bar{r}| = \lim_{\Delta t \to 0} \Delta s = ds$$

$$\boxed{d\bar{r} = ds\, \bar{u}_T}$$

$\bar{u}_T$: versore tangente alla traiettoria

$$\boxed{\bar{v} = \frac{d\bar{r}}{dt} = \frac{ds}{dt}\bar{u}_T = v\,\bar{u}_T}$$

$$\bar{v}(t) = \frac{d\bar{r}}{dt} \Rightarrow d\bar{r} = \bar{v}(t)\,dt$$

$$\Rightarrow \int_{\bar{r}_0}^{\bar{r}(t)} d\bar{r} = \int_{t_0}^{t} \bar{v}(t)\,dt \qquad \bar{r}_0 = \bar{r}(t_0)$$

$$\boxed{\bar{r}(t) = \bar{r}_0 + \int_{t_0}^{t} \bar{v}(t)\,dt}$$