Lezione 12/3/2020 (prosegue)

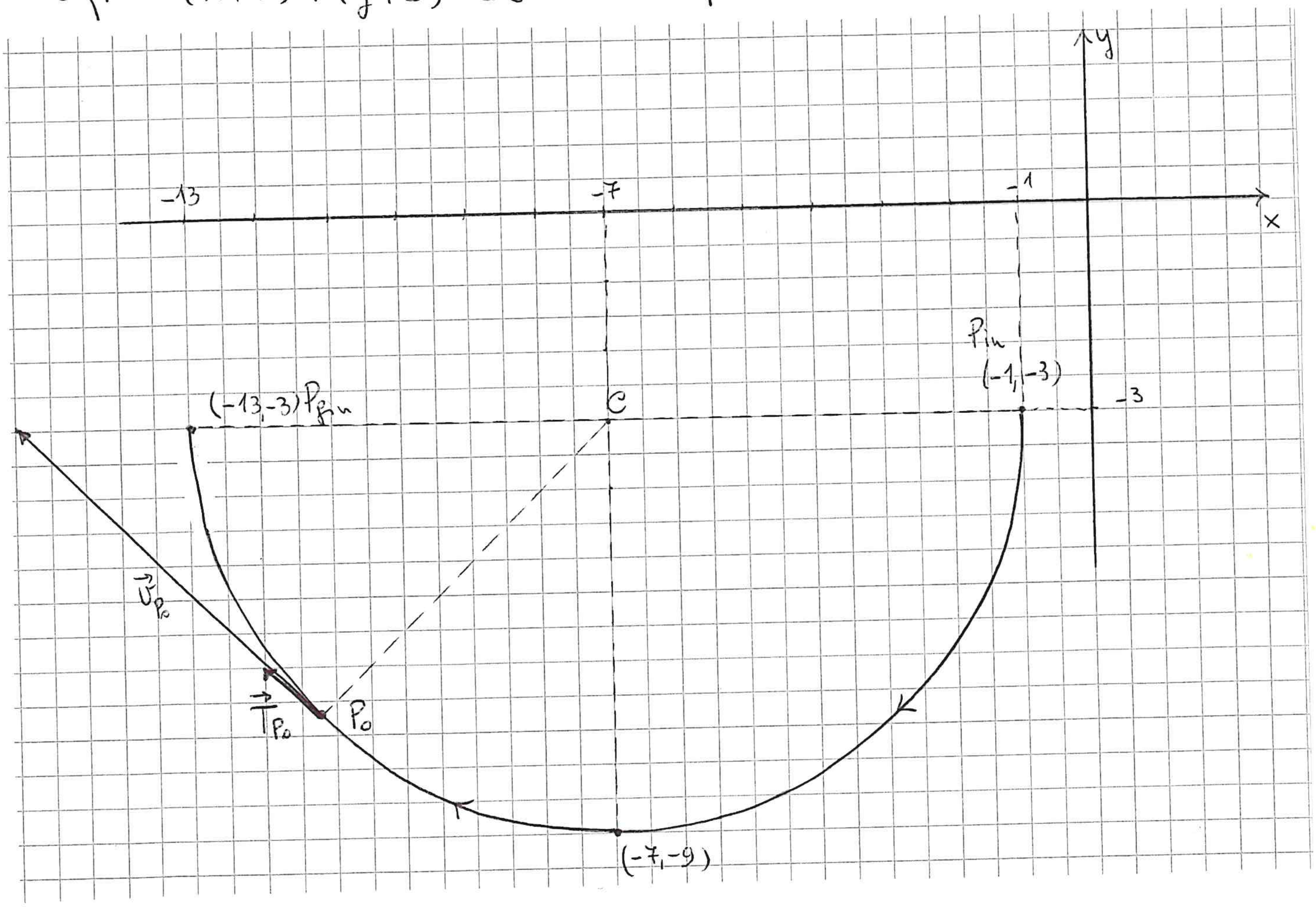
ESERCIZIO 1 $\gamma : [0,\pi] \to \mathbb{R}^2$ $\begin{cases} x(t) = -7 + 6\cos t \\ y(t) = -3 - 6\,\mathrm{sen}\,t \end{cases}$ $t \in [0,\pi]$

$P_{in} = (-1,-3)$ $P_{fin} = (-13,-3)$
$t=0$ $t=\pi$

La curva percorre la CIRCONFERENZA di $C(-7,-3)$ e $R=6$

in VERSO ORARIO per $\frac{1}{2}$ giro ($\Delta t = \pi$) da $(-1,-3)$ a $(-13,-3)$

eq.^{ne} $(x+7)^2 + (y+3)^2 = 36$ altri punti $t = \frac{\pi}{2}$ $(-7,-9)$.



$P_0 = (-7-3\sqrt{2}, -3-3\sqrt{2})$ $t_0 = \frac{3}{4}\pi$ $\gamma'(t) = (-6\,\mathrm{sen}\,t, -6\cos t)$
$\simeq -11{,}24$ $-7{,}24$

VETTORE TANG $\vec{v}_{P_0} = \gamma'\left(\frac{3}{4}\pi\right) = -3\sqrt{2}\,\vec{\imath} + 3\sqrt{2}\,\vec{\jmath}$

punta del vettore in $(-7-6\sqrt{2}, -3)$
$\simeq -15{,}5$

VERSORE TANG $\|\vec{v}_{P_0}\| = \sqrt{(-3\sqrt{2})^2 + (3\sqrt{2})^2} = \sqrt{18+18} = \sqrt{36} = 6$

↳ velocità scalare

$\vec{T}_{P_0} = -\frac{\sqrt{2}}{2}\vec{\imath} + \frac{\sqrt{2}}{2}\vec{\jmath}$.

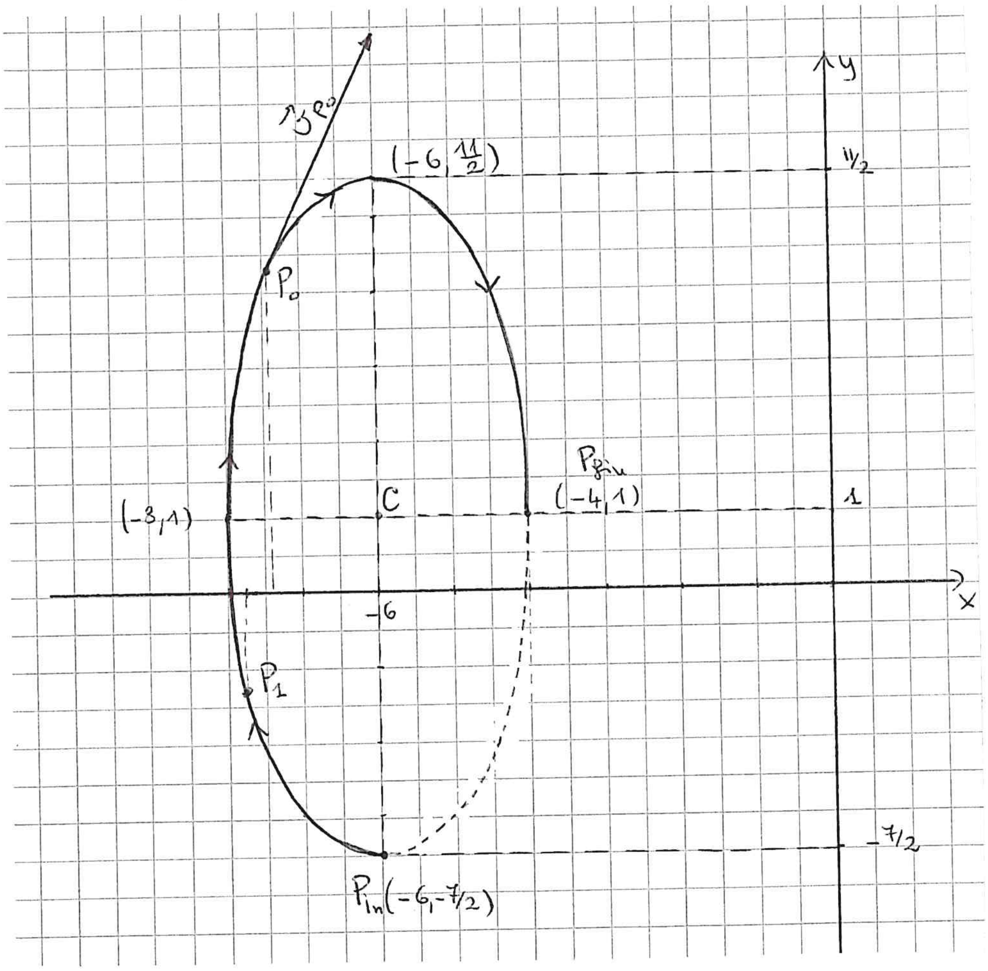
ESERCIZIO 2 $\gamma : [\frac{\pi}{2}, 2\pi] \to \mathbb{R}^2$ $\begin{cases} x(t) = -6 + 2\cos t \\ y(t) = 1 - \frac{9}{2} \operatorname{sen} t \end{cases}$ $t \in [\frac{\pi}{2}, 2\pi]$

$P_{in} = (-6, -\frac{7}{2})$ $P_{fin} = (-4, 1)$

La curva percorre l' ELLISSE di $C(-6,1)$ e semiassi $a=2$, $b=\frac{9}{2}$ in verso ORARIO per $\frac{3}{4}$ di giro ($\Delta t = \frac{3}{2}\pi$) da $(-6, -\frac{7}{2})$ a $(-4,1)$.

eq.^{ne} $\frac{(x+6)^2}{4} + \frac{(y-1)^2}{\frac{81}{4}} = 1$ altri punti: $t = \pi$ $(-8, 1)$

$t = \frac{3}{2}\pi$ $(-6, \frac{11}{2})$



$P_0 = (-6-\sqrt{2}, 1+\frac{9}{4}\sqrt{2})$ $t_0 = \frac{5}{4}\pi$ $\gamma'(t) = (-2\operatorname{sen} t, -\frac{9}{2}\cos t)$

$\simeq -7{,}4$ $\simeq 4{,}18$

VETTORE TANGENTE $\vec{v}_{P_0} = \gamma'(\frac{5}{4}\pi) = +\sqrt{2}\,\vec{i} + \frac{9}{4}\sqrt{2}\,\vec{j}$

punta del vettore in $(-6, 1+\frac{9}{2}\sqrt{2})$

$\simeq 7{,}36$

eq.^{ni} param. della r_{tan} $\begin{cases} x = -6-\sqrt{2} + \sqrt{2}\,t \\ y = 1 + \frac{9}{4}\sqrt{2} + \frac{9}{4}\sqrt{2}\,t \end{cases}$ $t \in \mathbb{R}$

a $t_1 = \frac{5}{6}\pi$ corrisponde $P_1 = (-6 + 2\cdot(-\frac{\sqrt{3}}{2}), 1 - \frac{9}{2}\cdot\frac{1}{2}) = (-6-\sqrt{3}, -\frac{5}{4})$

$\simeq -7{,}7$ $-\frac{5}{4} = -1{,}25$