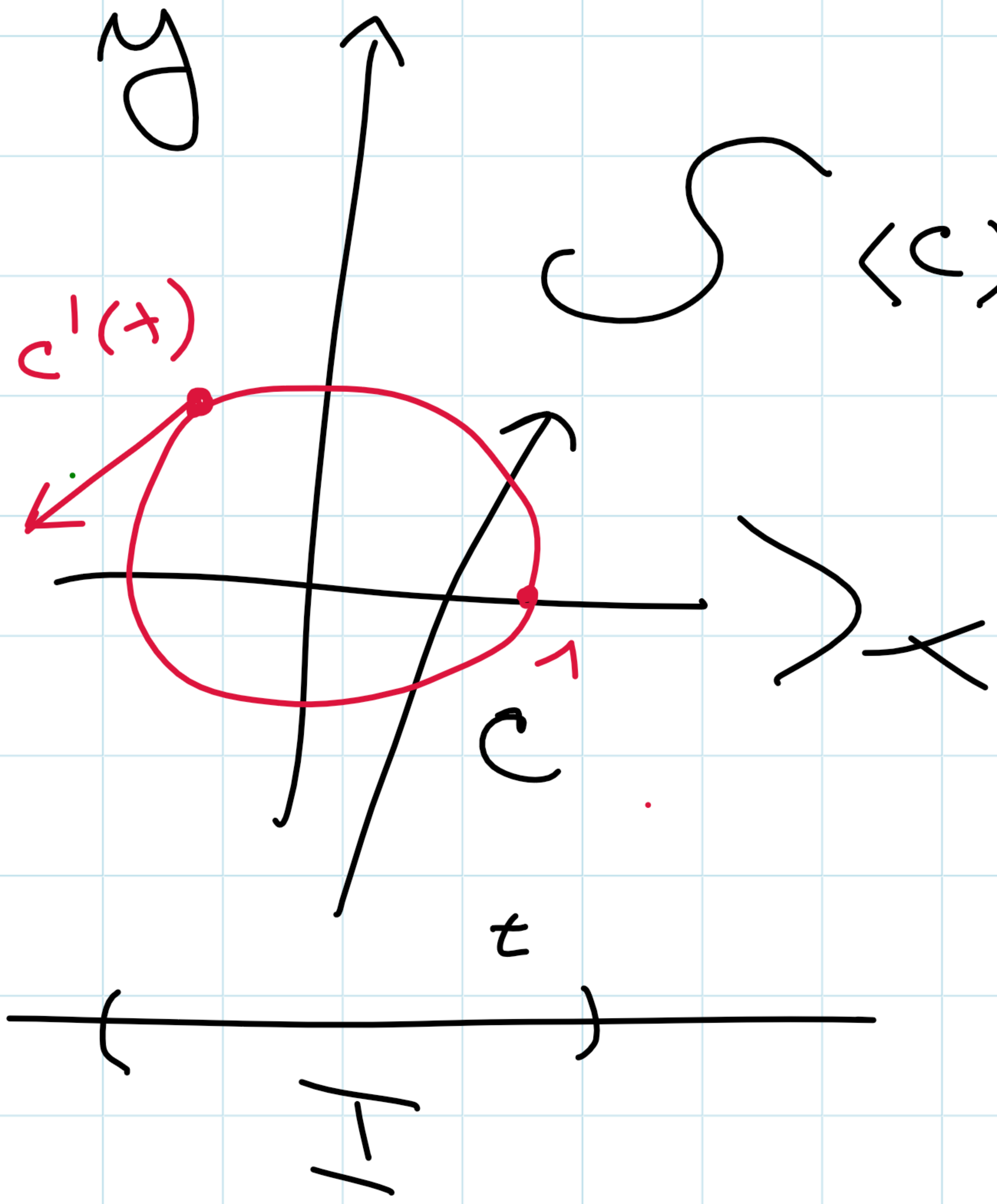
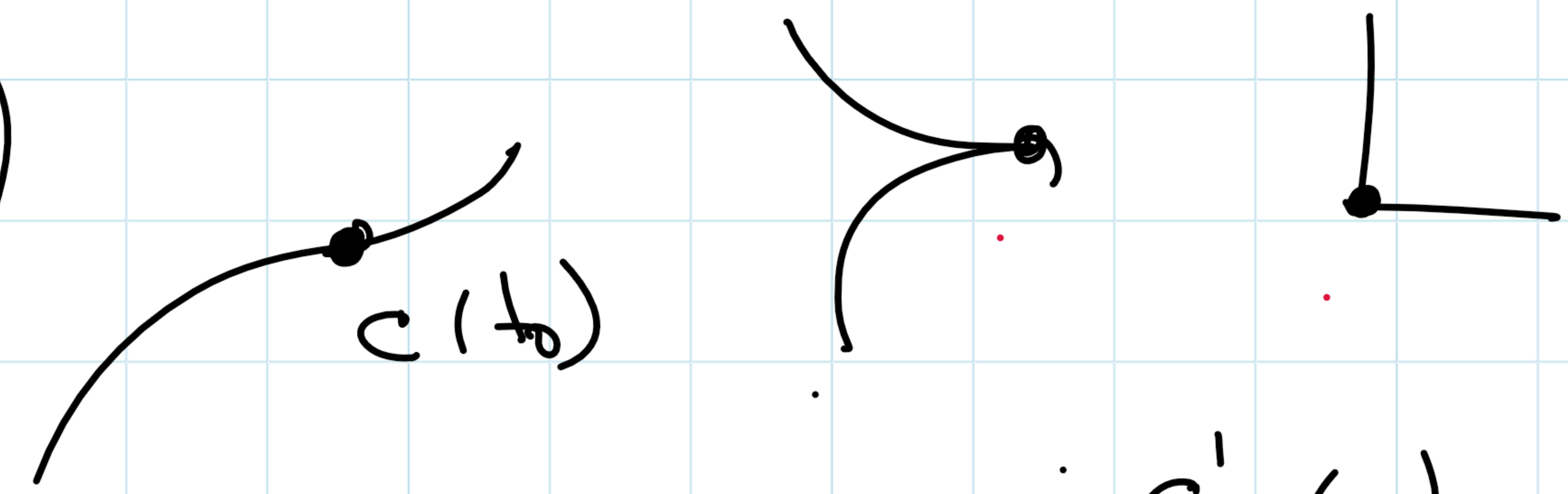


$c(t) = \begin{pmatrix} \cos t \\ \sin t \end{pmatrix}$

$t \in \langle 0, 2\pi)$

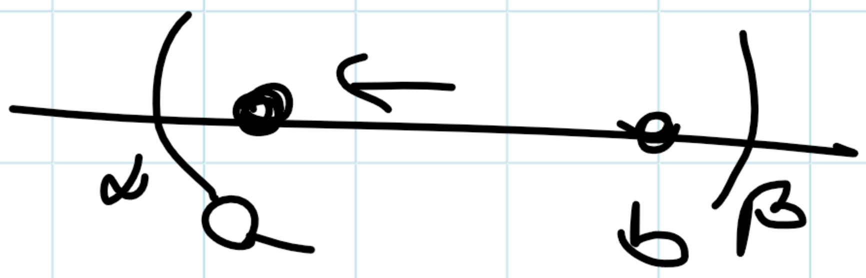
$c'(t) = \begin{pmatrix} -\sin t \\ \cos t \end{pmatrix}$

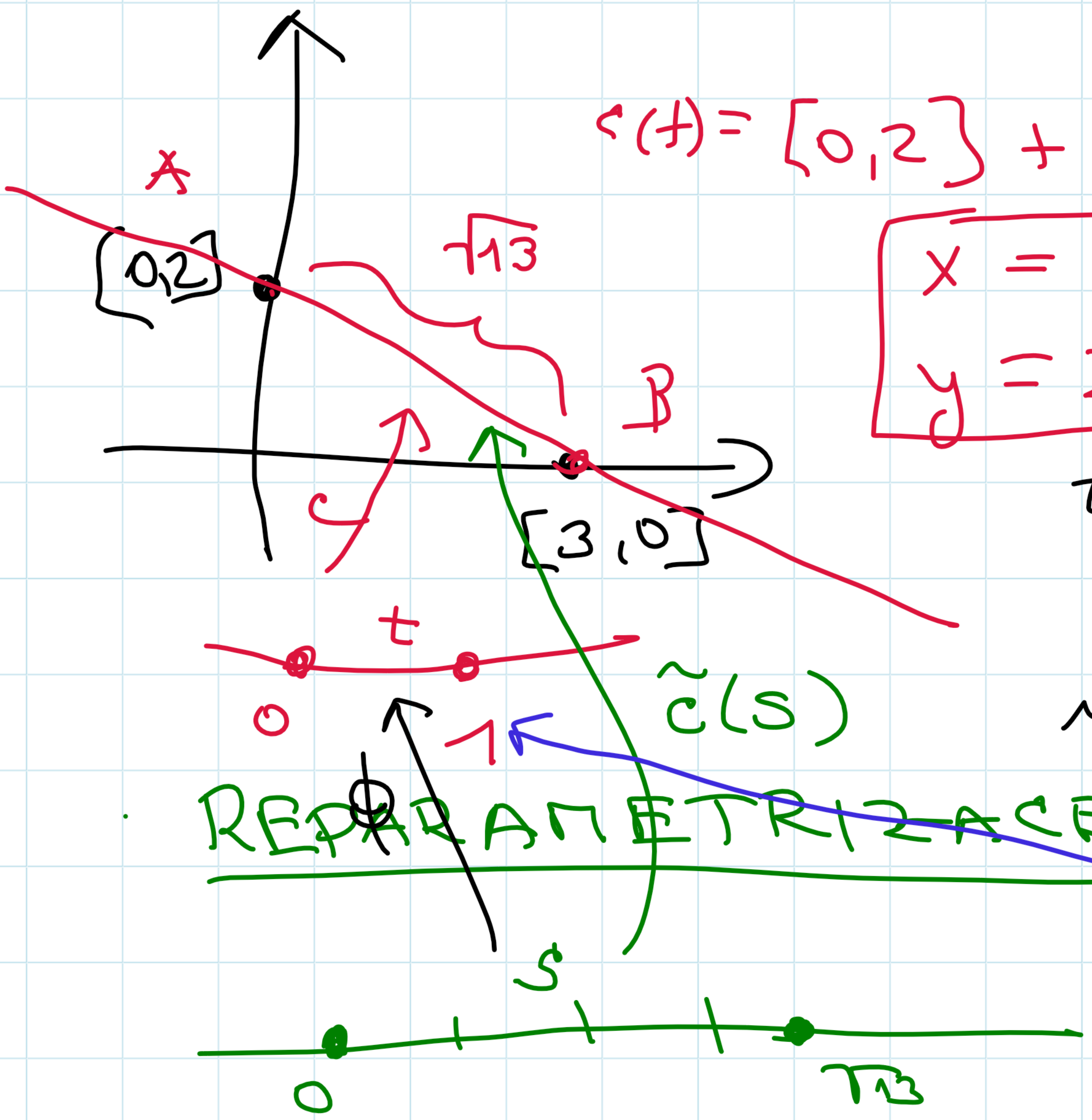
~~$c'(t_0) = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$~~



$c'_+(a)$ $c'_-(b)$

$I = \langle a, b \rangle$





$c(t) = [0,2] + t\,(3,-2)$ $t \in \mathbb{R}$

$x = 3t$
$y = 2 - 2t$

$A + t(B - A) =$
$= A(1-t) + Bt$

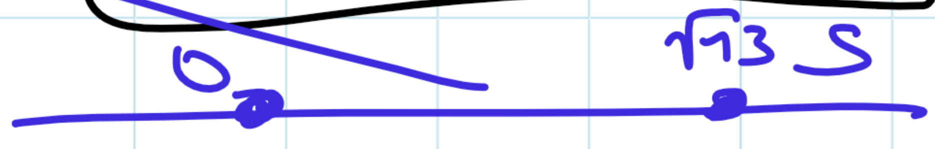
$t = \phi(s)$

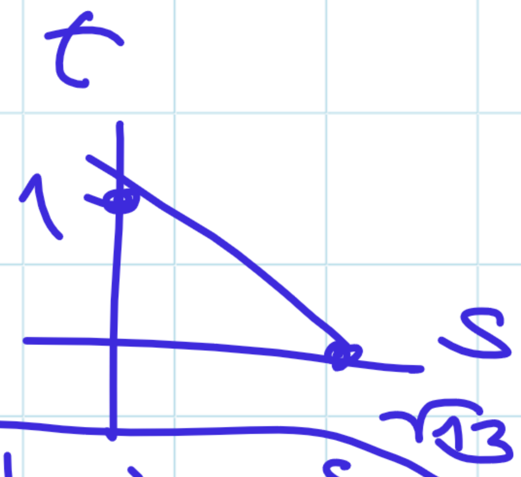
úsečka $t \in \langle 0, 1 \rangle$

$\tilde{c}(s)$

REPARAMETRIZACE

$\phi(s) = \frac{s}{\sqrt{13}}$





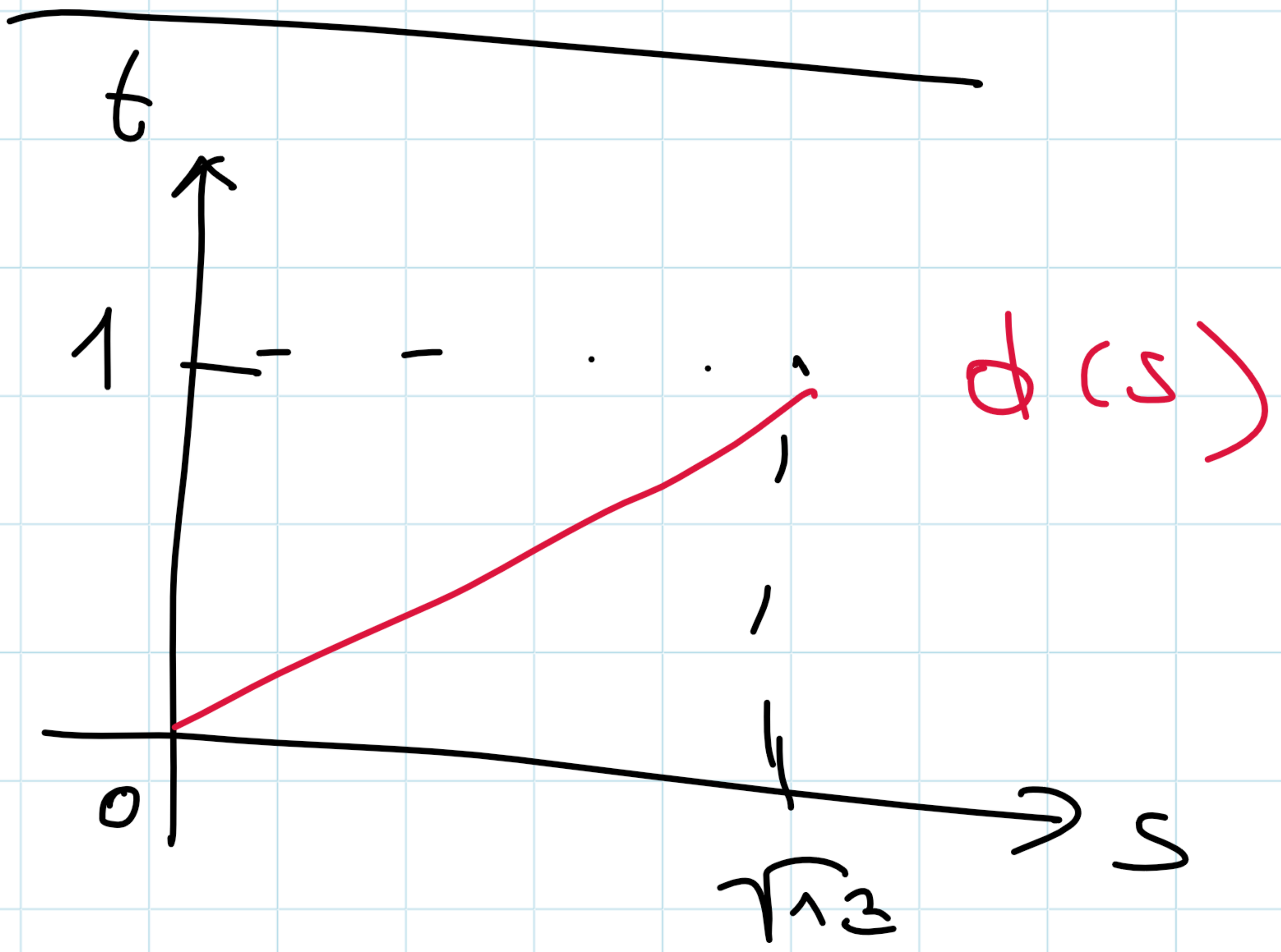
$\phi(s) = -\frac{s}{\sqrt{13}} + 1$

Diffeomorfismus

bijekce

$\phi \quad \dots \quad C^\infty$

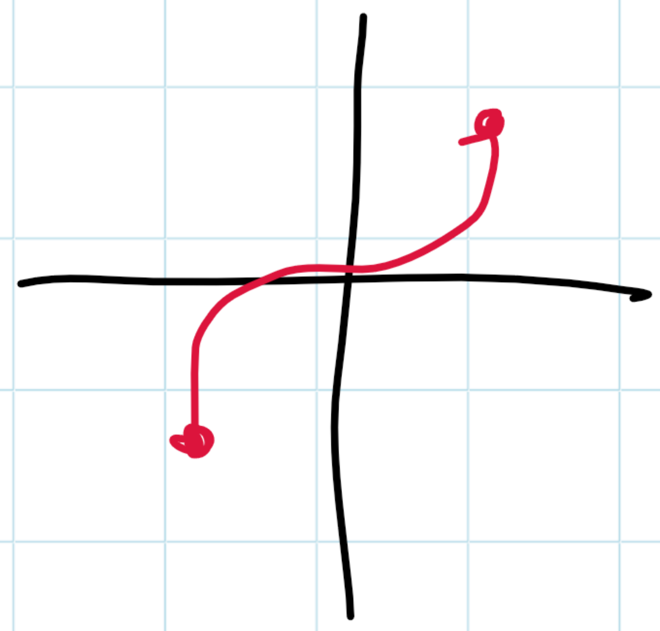
$\phi^{-1} \quad \dots \quad C^\infty$

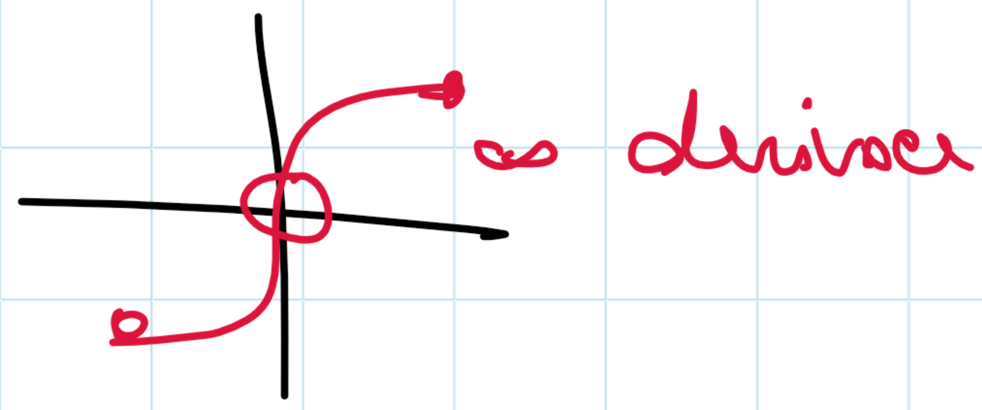


NENÍ DIFFOM

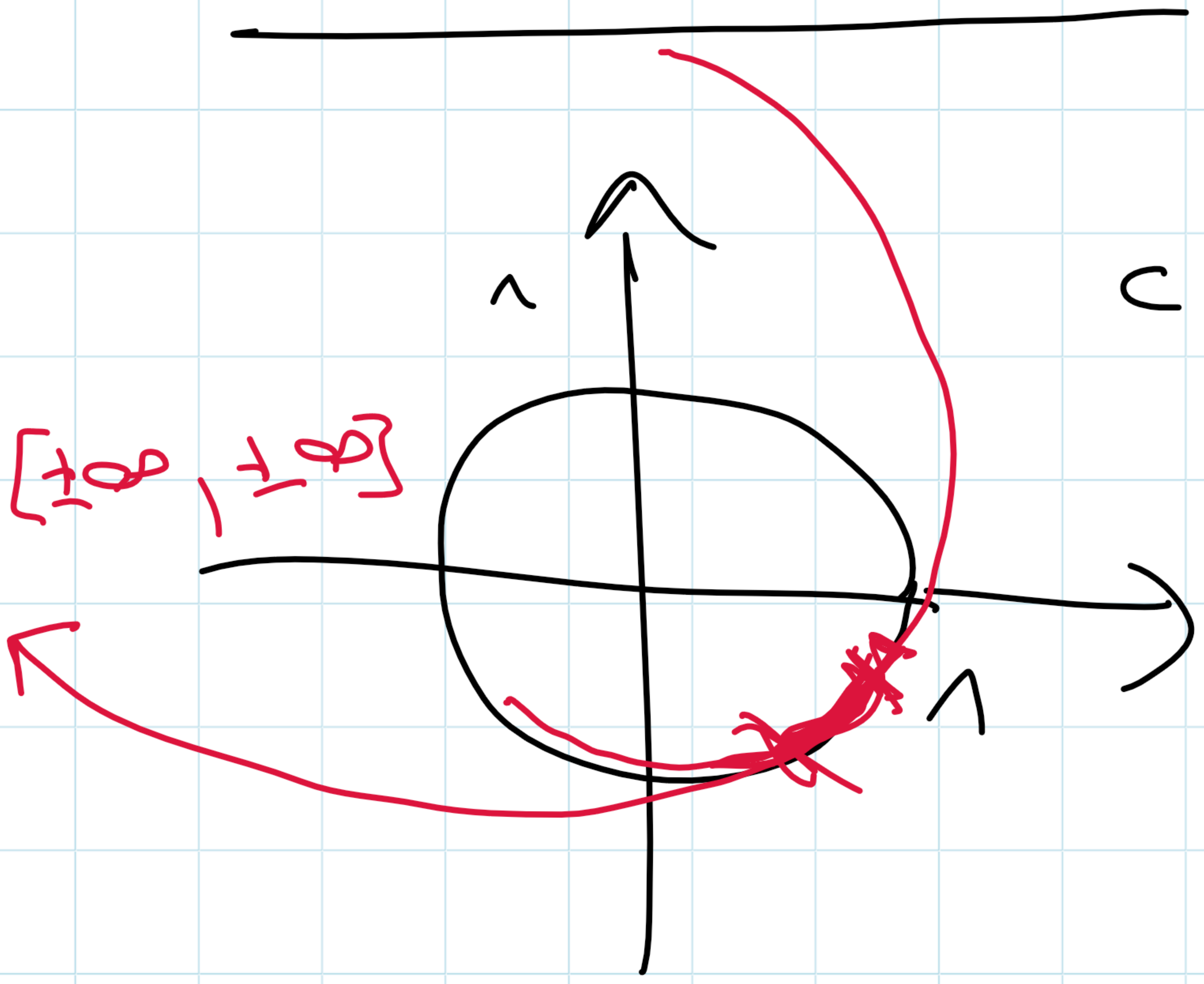
$\phi(s) = s^3 \qquad s \in (-1,1]$

$\phi^{-1}(t) = \sqrt[3]{t}$





PARAM. kružnice

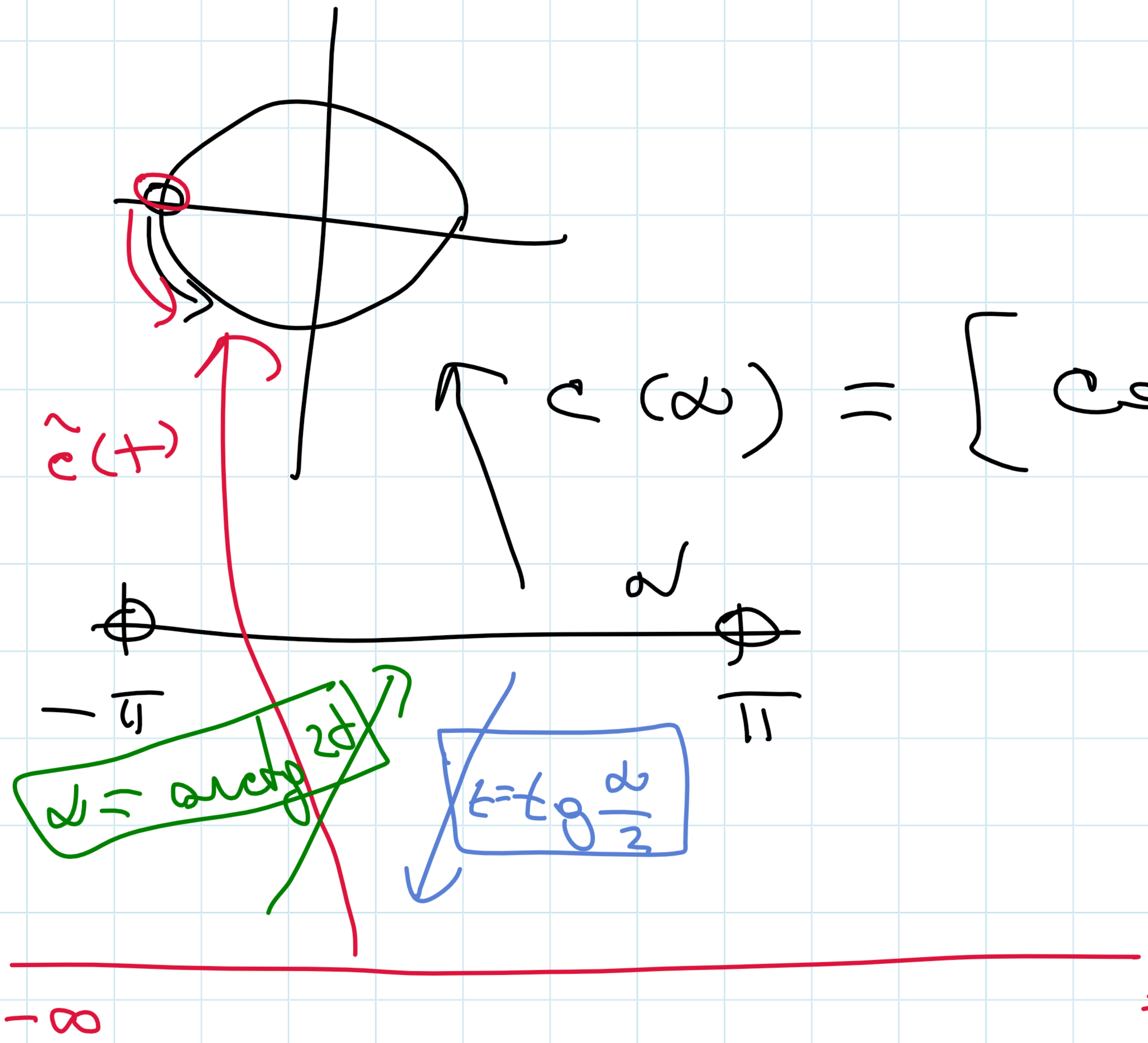


$c(t) = [p(t), q(t)]$

$p, q \in \mathbb{R}[x]$

$\lim_{t \to \infty} c(t) = [\pm\infty, \pm\infty]$

$\underbrace{x^2 + y^2}_{p^2+q^2-1} - 1 = 0$ vedoucí koef. $> 0 \quad \neq 0$

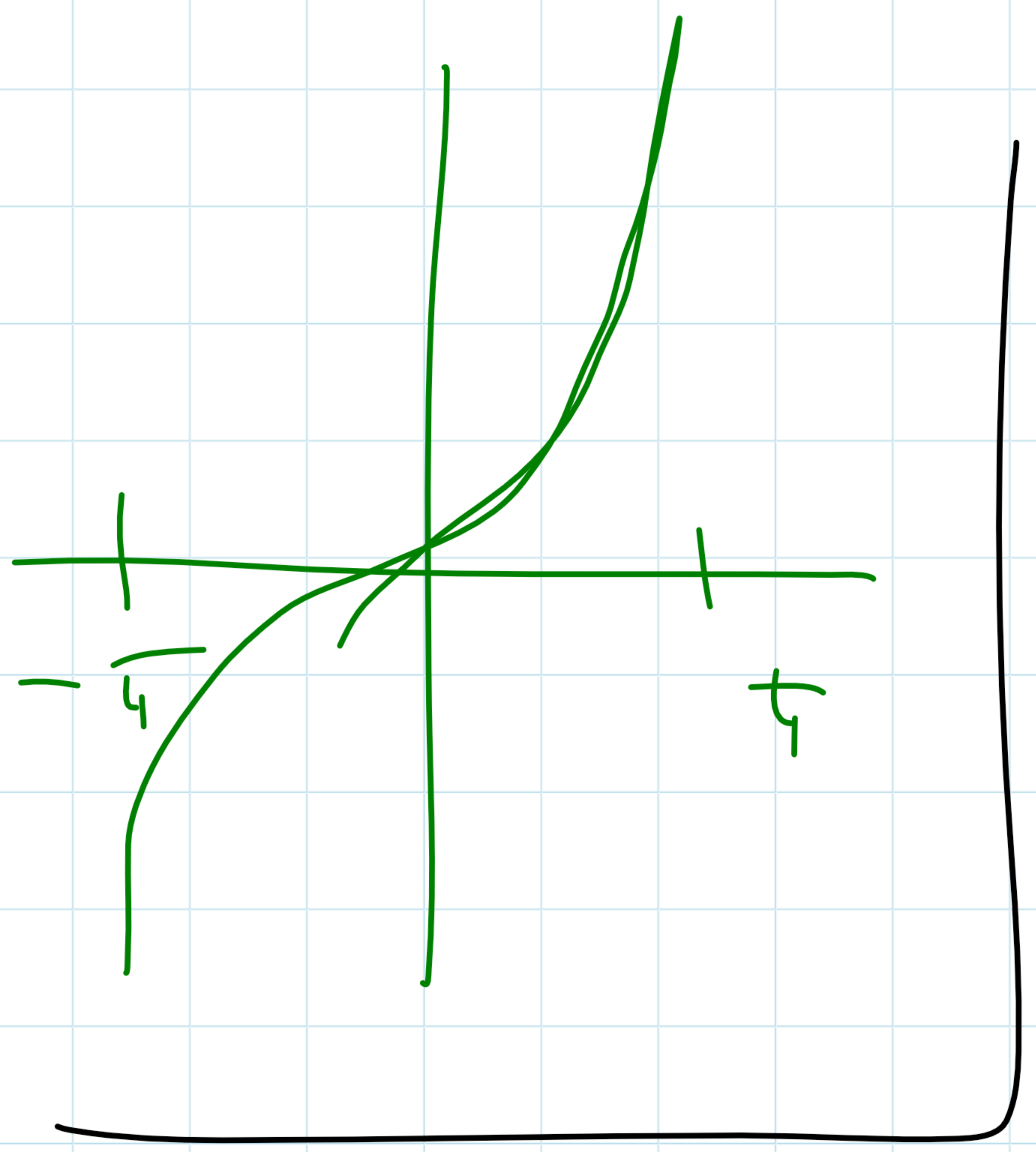


$$c(\alpha) = [\cos\alpha, \sin\alpha]$$

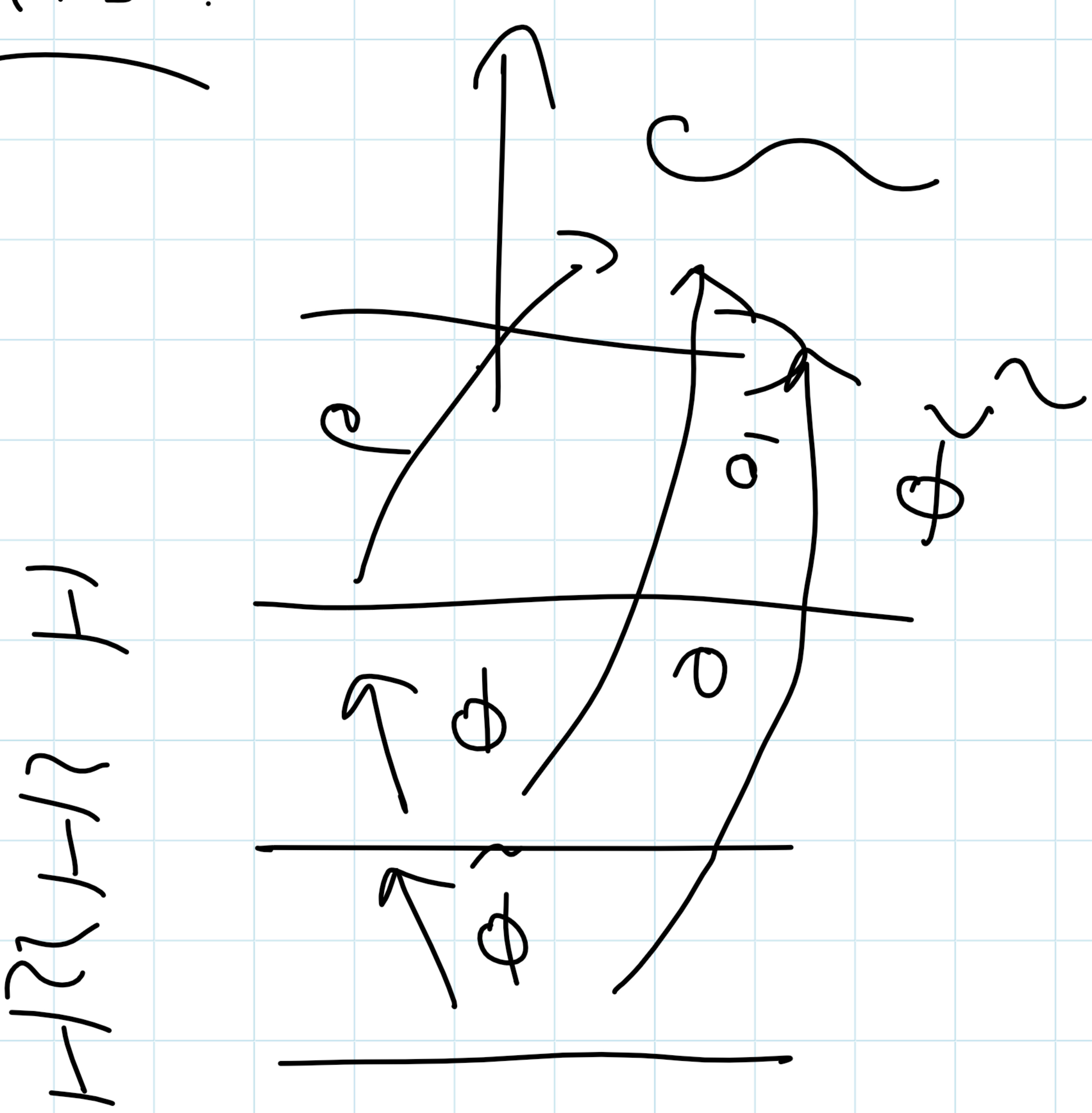
$$\tilde c(t) = \left[\frac{1-t^2}{1+t^2}, \frac{2t}{1+t^2}\right]$$

$$c(\alpha) = \tilde c\left(tg \frac{\alpha}{2}\right)$$

$$\tilde c(t) = c(\arctg 2t)$$

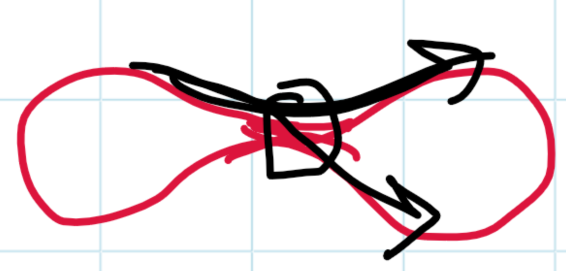


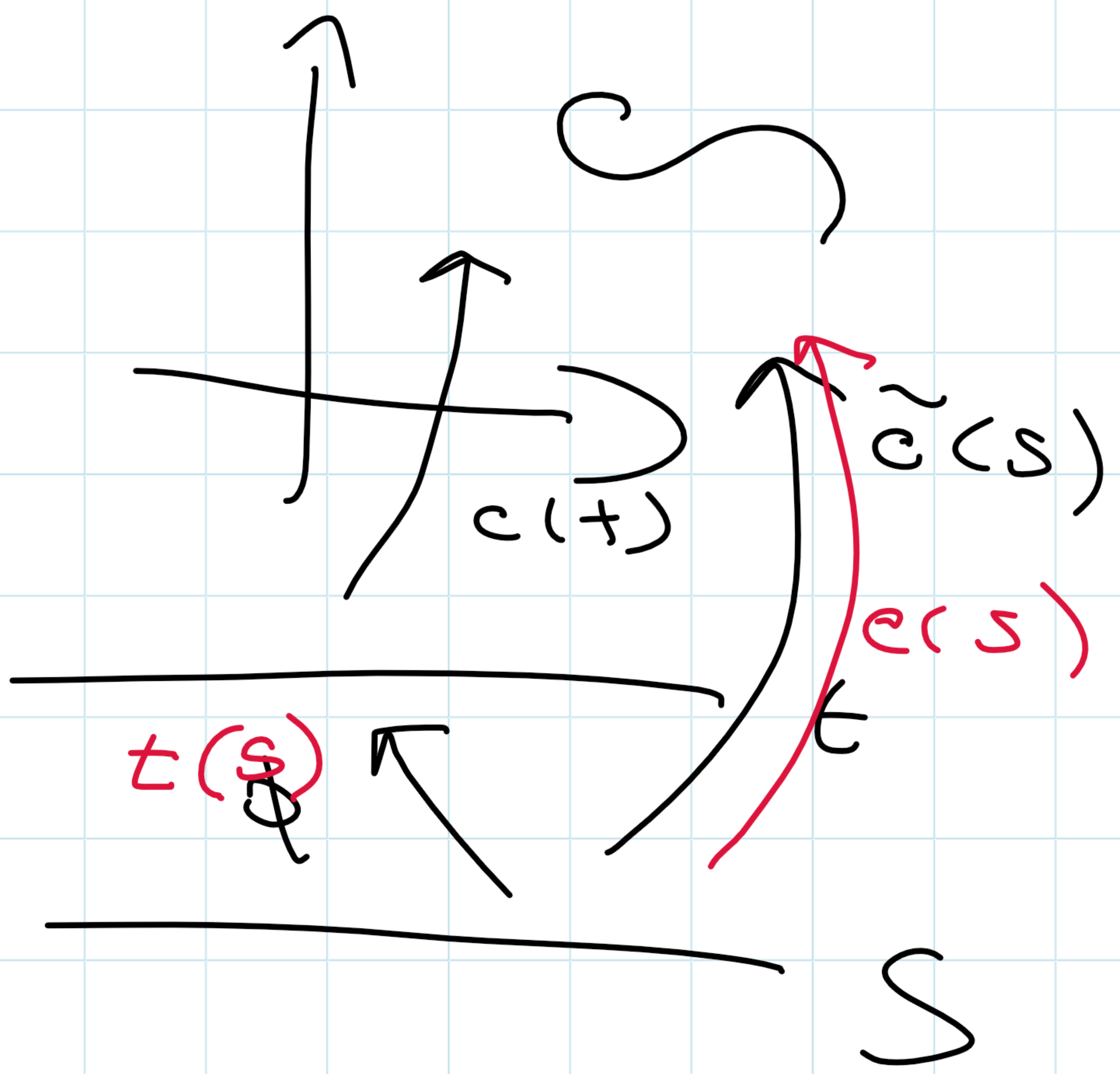
1.3



$$[c \circ \phi] \circ \tilde\phi = c \circ [\phi \circ \tilde\phi]$$

$\tilde c$





$\tilde{c} = c \circ \phi$

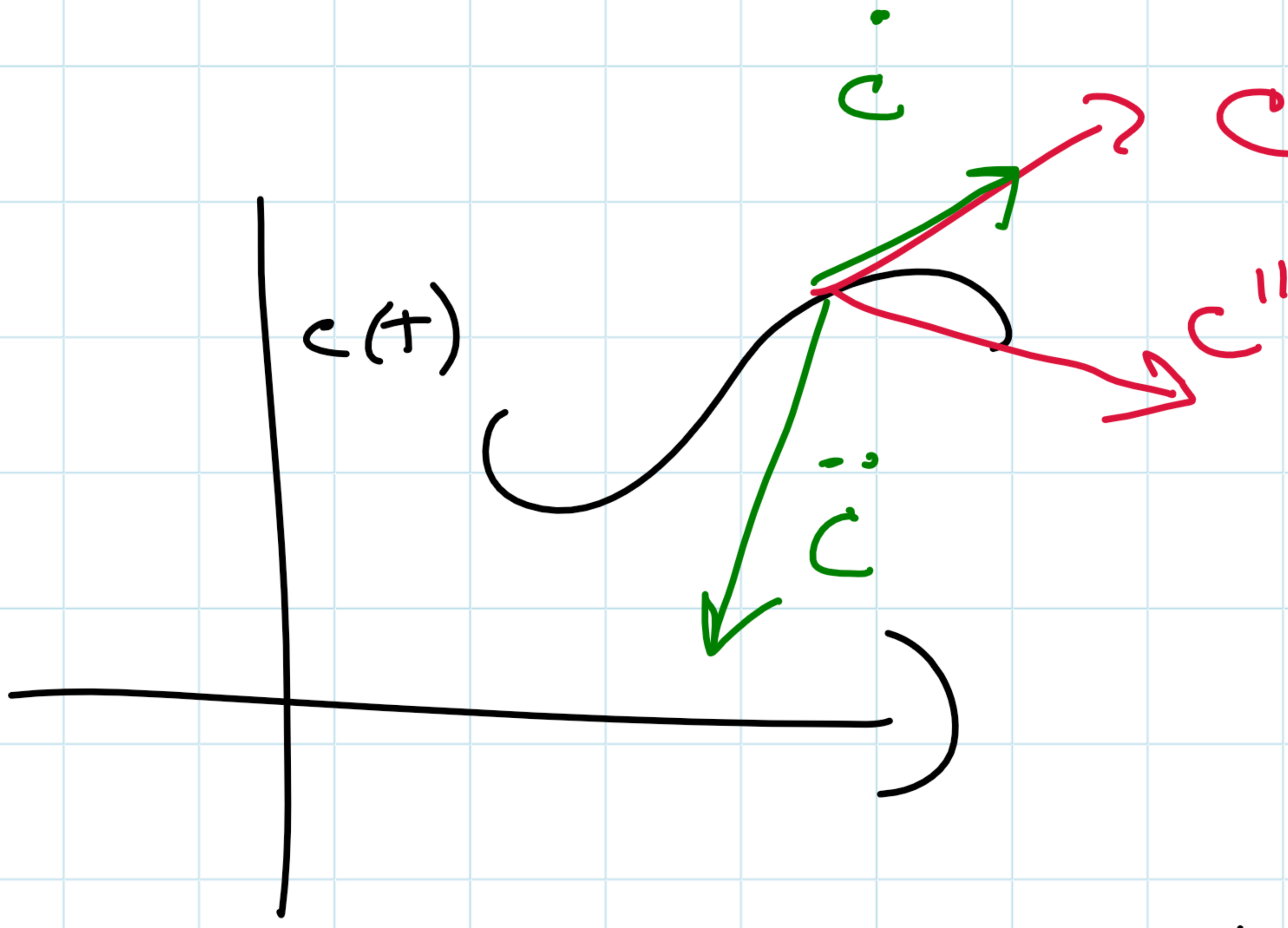
$$\tilde{c}(s) = c(\phi(s))$$

$f(x)$ $y(x)$

c' $\quad$ $c(t)$: $\frac{dc}{dt}$ $\quad$ $c(s)$: $\left(\frac{dc}{ds}\right)$ $\quad$ $\dot{c}$

$$\dot{c} = \frac{d\tilde{c}(s)}{ds} = \frac{d}{ds}\Big|_{s=s_0} c(\phi(s)) = \frac{dc}{dt}\Big|_{t=\phi(s_0)} \cdot \frac{d\phi}{ds}\Big|_{s=s_0} =$$

$$= c' \cdot \dot{t}$$



$\dot{c} = \dot{t}\, \dot{c}$

$\ddot{c}$ c''

stojmó połowinia

$\dot{t} = \frac{d\ell}{ds}$

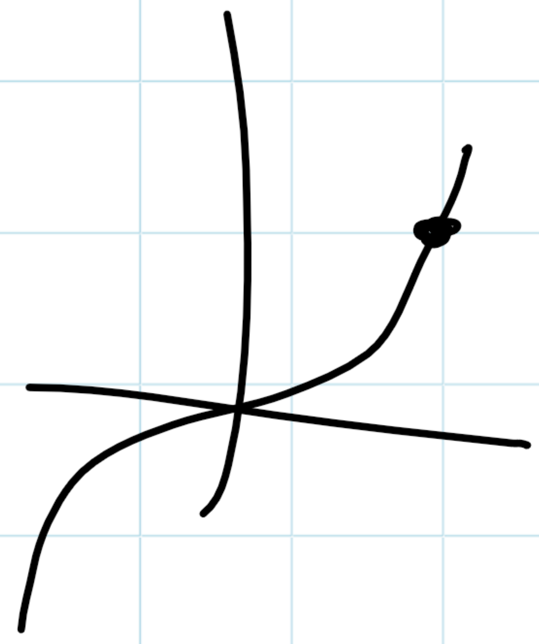
$\dot{c} = \dot{t} \cdot c' \quad \Big|\ \cdot \frac{d}{ds}$

$\ddot{c} = \ddot{t} \cdot c' + \dot{t}\, \dot{(c')} =$

$= \ddot{t} \cdot c' + \dot{t}\,(c'' \cdot \dot{t}) =$

$= \ddot{t} \cdot c' + (\dot{t})^2 \cdot c''$

≥ 0



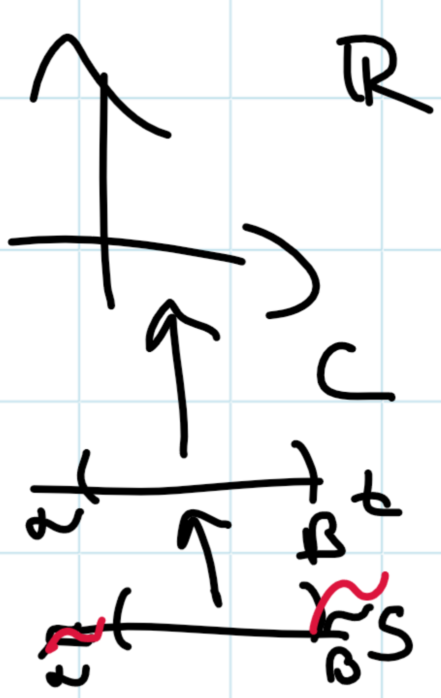
$c(t) = [\cos t, \sin t] \qquad t \in \left(-\frac{\pi}{4}, \frac{\pi}{4}\right)$

$c'(t) = [-\sin t, \cos t]$

$\|c'(t)\| = \sqrt{(-\sin t)^2 + (\cos t)^2} = 1$ my chlol, r(t)

$d = \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \|c'(t)\|\, dt = \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} 1\, dt = \frac{2\pi}{4}$

DK 1.5



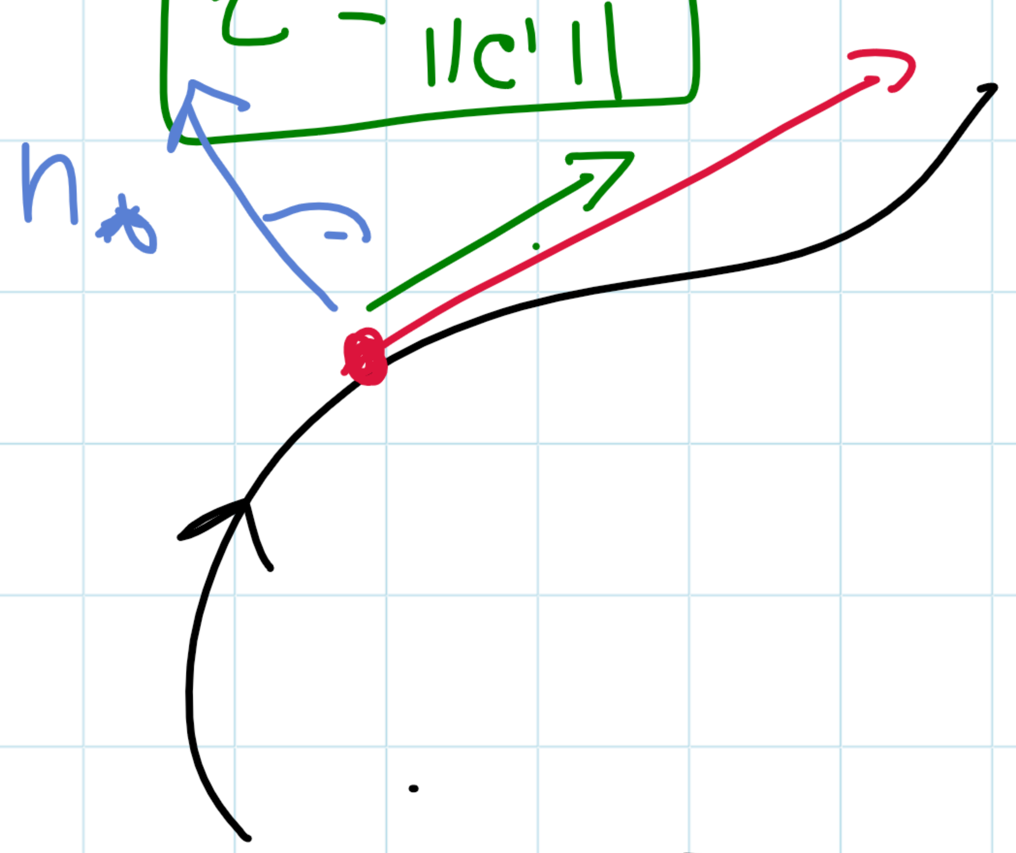
$\dot{t} > 0$

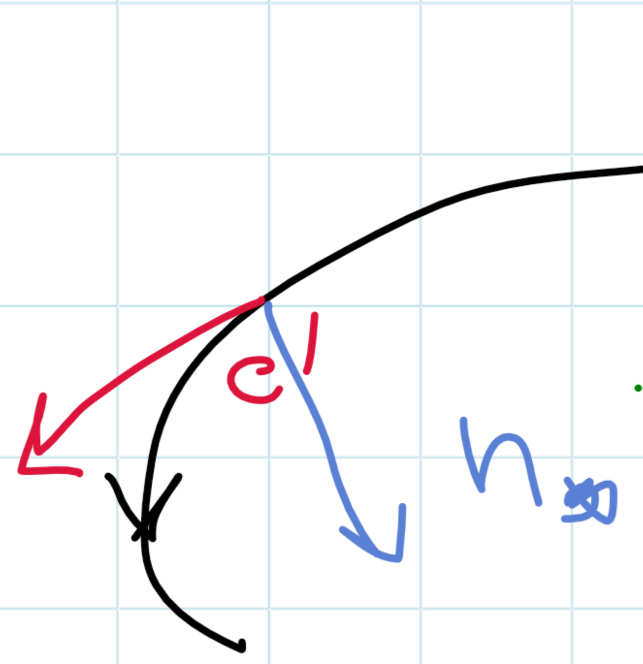
$\int_{\tilde{\alpha}}^{\tilde{\beta}} \|\dot{c}(s)\|\, ds = \int_{\tilde{\alpha}}^{\tilde{\beta}} \|\dot{t}\, c'(t)\|\, ds =$

$= \int_{\tilde{\alpha}}^{\tilde{\beta}} \|c'(t)\|\, \dot{t}\, ds = \int_{\alpha}^{\beta} \|c'(t)\|\, dt$

$t = t(s)$

$$\vec{t} = \frac{c'}{\|c'\|}$$



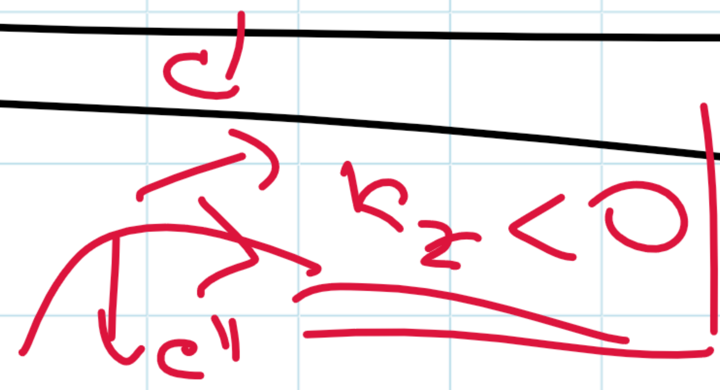


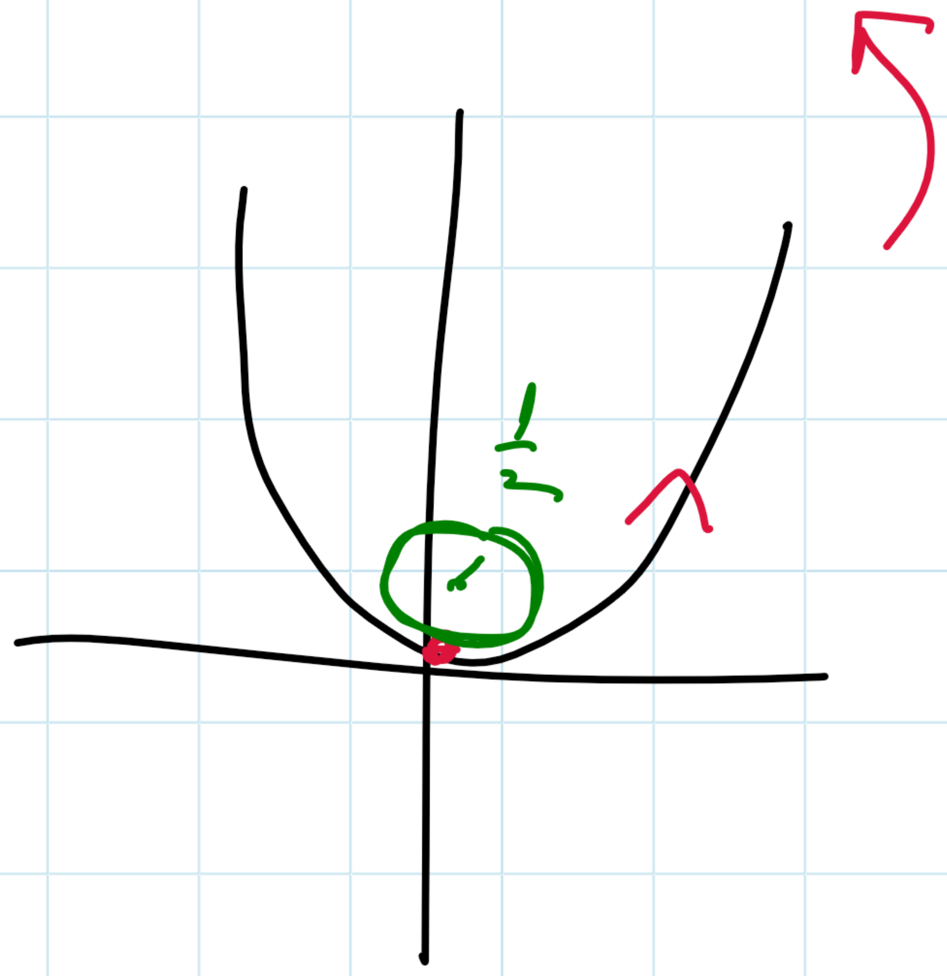
$$K = \{(1,0), (0,1)\} \longrightarrow \{\vec{t}, n_*\}$$

MATICE PŘECHODU
DET > 0 = 1

$$\vec{n}_* = \begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix} \vec{t}$$

← ROT $\frac{\pi}{2}$





$$c(t) = [t, t^2]$$

$$c'(t) = [1, 2t] \Rightarrow \|c'\| = \sqrt{1+4t^2}$$

$$c''(t) = [0, 2]$$

$$k_z(t) = \frac{\begin{vmatrix} 1 & 2t \\ 0 & 2 \end{vmatrix}}{\|c'\|^3} = \frac{2}{(1+4t^2)^{3/2}} > 0$$

MAX k_z je pro $t = 0$

$$k_z(0) = 2$$

Dk 1.7

$$\frac{\det(\dot{c}, \ddot{c})}{\|\dot{c}\|^3} = \frac{\det(\dot{t}c', \ddot{t}c' + (\dot{t})^2 \cdot c'')}{\|\dot{t}c'\|^3} =$$

$$= \frac{(\dot{t})^3 \det(c', c'')}{|\dot{t}|^3 \|c'\|^3} = \operatorname{sign}(\dot{t}) \frac{\det(c', c'')}{\|c'\|^3}$$

± 1