

$$\Theta'(s) = f_e(s) \quad s = s(t)$$

$$\frac{d\Theta(s(t))}{dt} = \frac{d\Theta(s(t))}{ds} \cdot \frac{ds}{dt} = f_e(s(t))$$

$$\frac{df}{dt} = \frac{df}{ds} \cdot \underbrace{\frac{ds}{dt}}_{>0} \quad / \quad || \dots ||$$

$$|| \frac{df}{dt} || = \frac{ds}{dt} \Rightarrow \frac{dt}{ds} = \frac{1}{|| \frac{df}{dt} ||}$$

$$\Theta'(s) = \frac{d\Theta}{ds} = f_e(s)$$

$$t = t(s)$$

$$\frac{d\Theta}{ds} = \frac{d\Theta}{dt} \cdot \frac{dt}{ds} = \frac{d\Theta}{dt} \cdot \frac{1}{|| \frac{df}{dt} ||} = f_e(s)$$

$$\left| \frac{d\Theta}{dt} = f_e(t) \cdot || \frac{df}{dt} || \right|$$

• mějme dvě funkce  $\Theta_1(t)$  a  $\Theta_2(t)$

$$\cos(\Theta_1(t)) = \cos(\Theta_2(t))$$

$$\sin(\quad) = \sin(\quad)$$

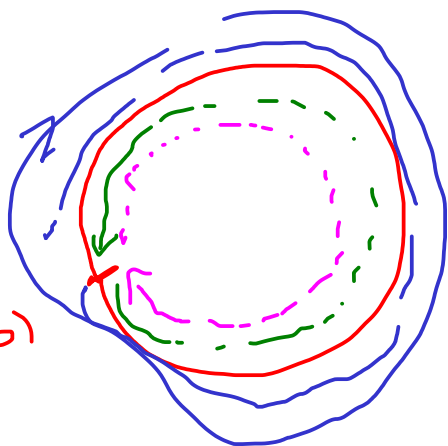
$$\Theta_1(t) - \Theta_2(t) = \sum k(t) \pi$$

$$k(t) \in \mathbb{N}$$

$$\Rightarrow k(t)$$

$j$  je konstanta

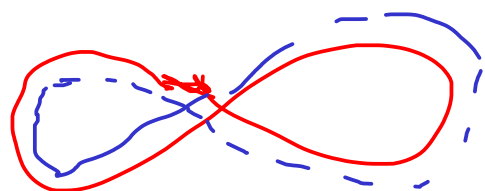
$$\Theta_1(t) - \Theta_1(a) = \Theta_2(t) - \Theta_2(a) \quad \square$$



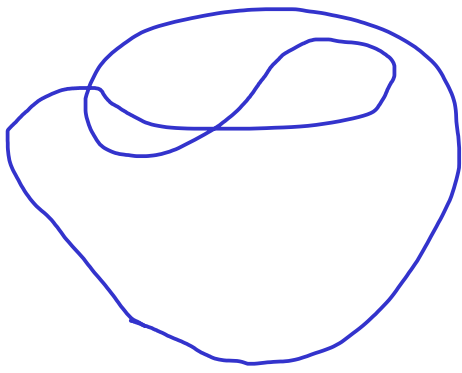
$$M_c = 1$$

$$M_c = -1$$

$$M_c = -2$$

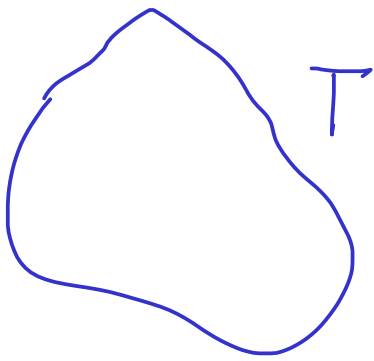


$$M_c = 0$$

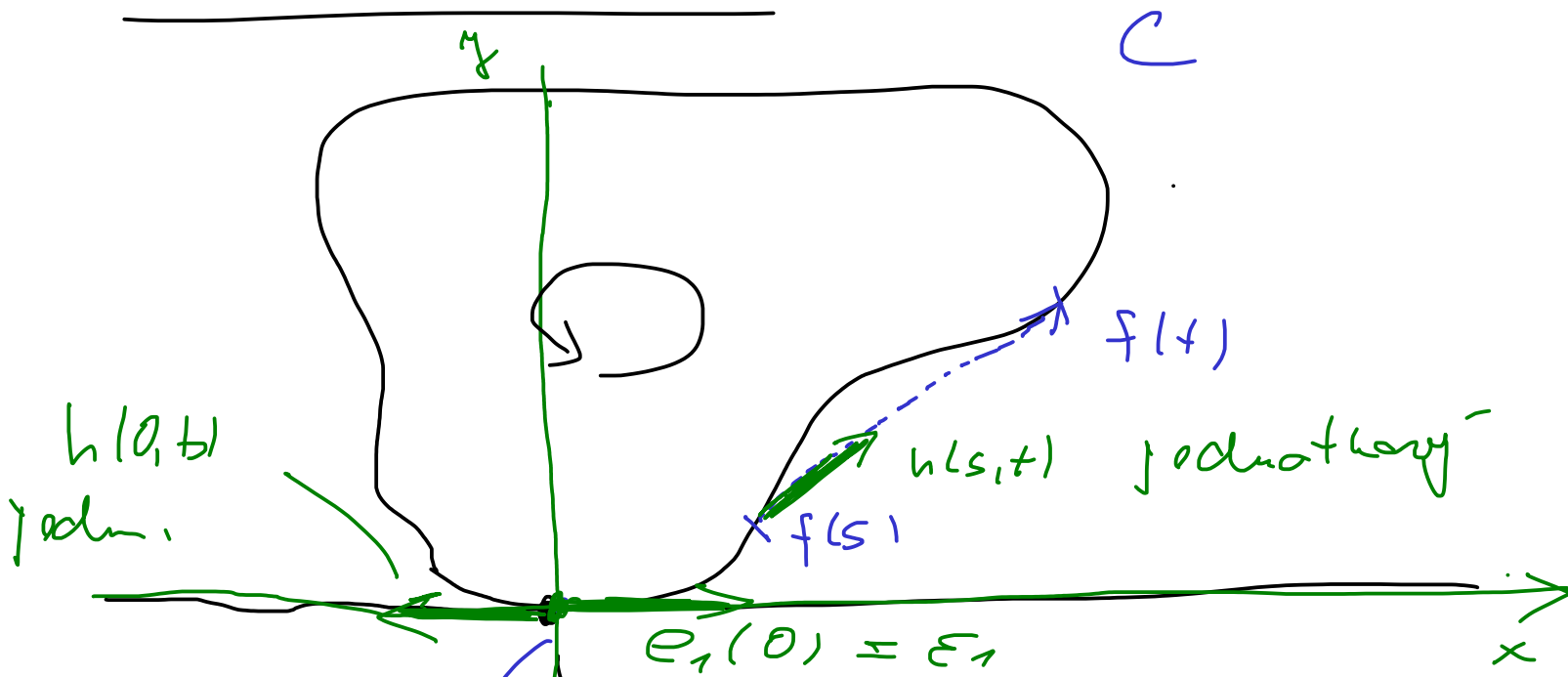


$\mu_c = \pm 1$   
 nicht jodun.

$T \subseteq \mathbb{R}^2$  homomorphie  $x \mapsto$   
 $u \circ \sigma \circ t$



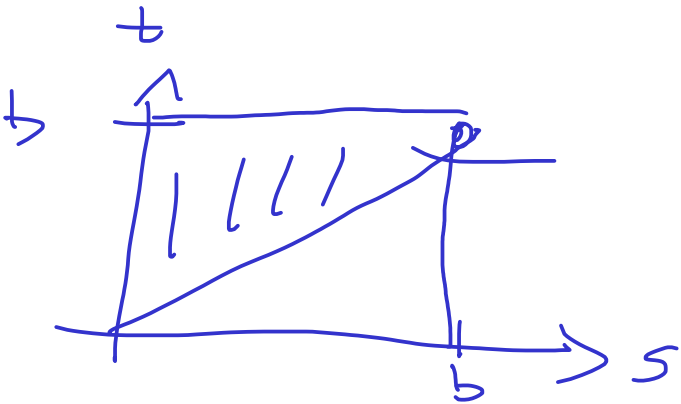
Hopf Umkehrset  $\pi$ :



↓  
"nejméně 1 bod"

$$f(a) = f(b)$$

$$\Delta = \{(s, t) \mid 0 \leq s \leq t \leq 1\}$$



$$s \leq t$$

$$\tilde{\Theta}(t, t) = \Theta(t)$$

$$\forall t \in [a, b]$$