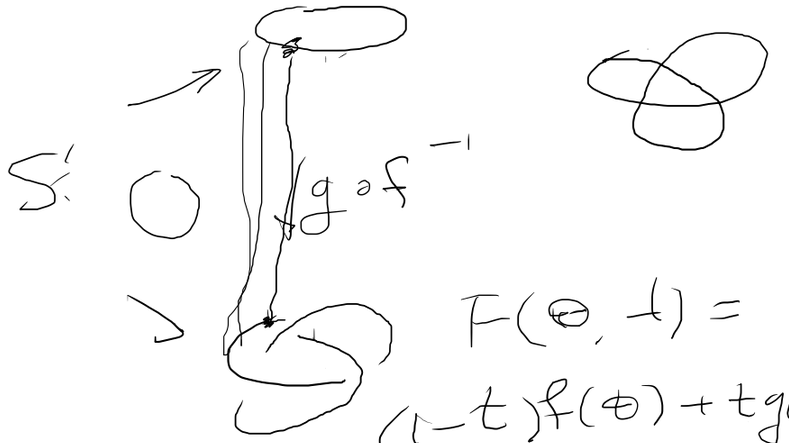
$S^1 \xrightarrow{f} M^1 \subset \mathbb{R}^3$

cpct
conexa



$S^1 \xrightarrow{g} N^1 \subset \mathbb{R}^3$

$F(\Theta, t) = (1-t)f(\Theta) + tg(\Theta)$

Teo: f no se puede "deformar" a g.

(1) $F : S^1 \times [0,1] \longrightarrow \mathbb{R}^3$

$F(\Theta, t)$

$\Theta \in S^1$

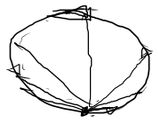
- $F_0 = f$, $F_1 = g$
- $F_t = F(\cdot, t)$ es un difeo, $\forall t \in [0,1]$.

$$\mathcal{E} = \{ f : S^1 \to \mathbb{R}^3 \mid f \text{ encaje} \}.$$

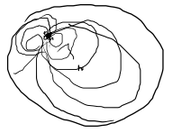
f, g estan en dos componentes conexas distintas.

(2) $f: B^n \to B^n$ difeo con 1 solo p.f. $\in \partial B^n$

(ne en ∂B^n, $x \mapsto -x$)



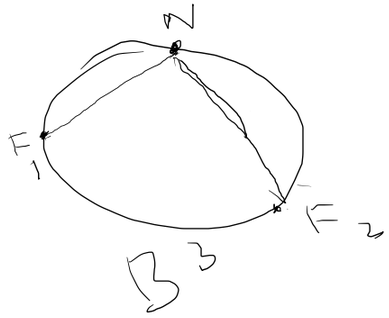
B^2



B^3

sí se puede para $n = 2, 3$

$S^2 \to S^2$

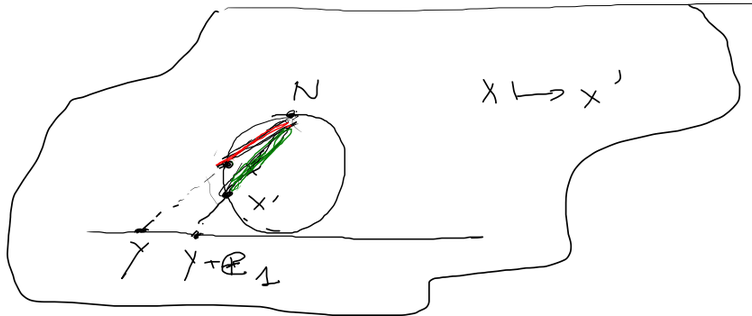


B^3

$S^n \xrightarrow{f} S^n$

difeo con 1 solo punto fijo?

(2)



$B^2 \times S^1$ $\circlearrowright$ f sin $p_1 - S_1$

?