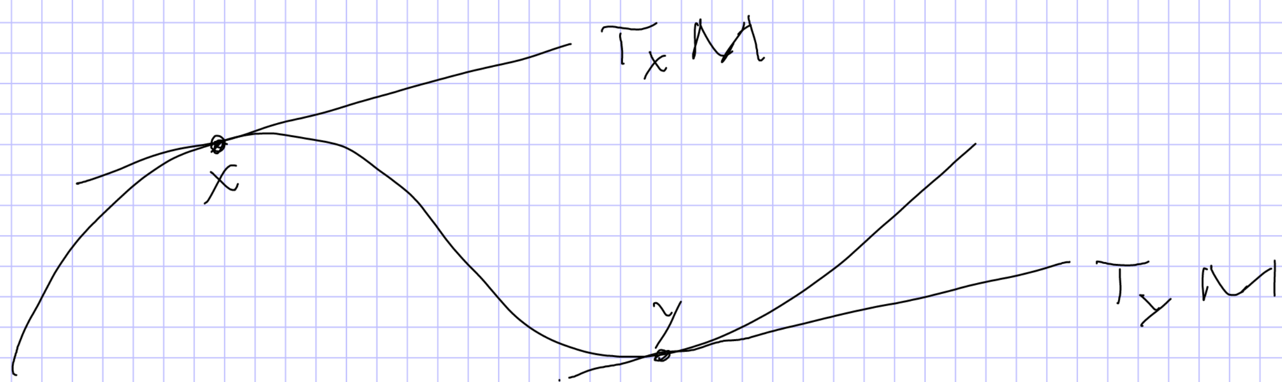
Caso particular de un lema visto:

$$v = \frac{\partial}{\partial y_i}, \quad \psi = (y_1, \dots, y_n)$$

$$\therefore \left.\frac{\partial}{\partial y_i}\right|_{x_0} = \sum_{j=1}^{n} \frac{\partial x_j}{\partial y_i}(x_0) \left.\frac{\partial}{\partial x_j}\right|_{x_0}$$

Sin usar derivaciones:



$x \neq y$ pero $T_xM = T_yM$

df_z ó $T : \mathbb{R}^2 \longrightarrow \mathbb{R}^2$

$$\begin{array}{ccc} (x,y)\ \mathbb{R}^2 & \xrightarrow{\quad T \quad} & \mathbb{R}^2\ (x,y) \\ \downarrow \varphi & & \downarrow \varphi \\ x+iy\ \ \mathbb{C} & \xrightarrow{\ \varphi \circ T \circ \varphi^{-1}\ } & \mathbb{C}\ \ x+iy \end{array}$$

$\varphi \circ T \circ \varphi^{-1} \equiv T$ en $\mathbb{C}$

$$\frac{\partial}{\partial \bar{z}}(|z|^2) = \frac{\partial}{\partial \bar{z}}(z\bar{z}) = z \quad ??$$

Por otro lado en M con
$(U, \varphi = (x_1, \dots, x_n))$

$$\frac{\partial x_i}{\partial x_j}(x_0) = \delta_{ij} \quad \forall i,j,\ x_0 \in U.$$

$$\begin{aligned} \frac{\partial x_i}{\partial x_j}(x_0) &= \frac{\partial (u_i \circ \varphi)}{\partial x_j}(x_0) \\ &= \frac{\partial (u_i \circ \varphi \circ \varphi^{-1})}{\partial u_j}(\varphi(x_0)) \\ &= \frac{\partial u_i}{\partial u_j}(\varphi(x_0)) = \delta_{ij} \end{aligned}$$