En las construcciones con
M compleja, J estr. compleja
$(U, \varphi = (z_1, \dots, z_n))$
$z_j = x_j + i y_j$

se debe probar que:

$$J_z \frac{\partial}{\partial x_j} = \frac{\partial}{\partial y_j}$$

$$J_z \frac{\partial}{\partial y_j} = -\frac{\partial}{\partial x_j}$$

Esto se prueba usando el diagrama conmutativo:

$$\begin{tikzcd}
T_z M \arrow[r, "J_z"] \arrow[d, "d\varphi_z"'] & T_z M \arrow[d, "d\varphi_z"] \\
\mathbb{C}^n \arrow[r, "ix = J_0"] & \mathbb{C}^n
\end{tikzcd}$$

junto con:

en $\mathbb{C}^n$ $\quad w = (w_1, \dots, w_n)$

$$w_j = u_j + i v_j$$

$$J_0 \frac{\partial}{\partial u_j} = \frac{\partial}{\partial v_j}, \quad J_0 \frac{\partial}{\partial v_j} = -\frac{\partial}{\partial u_j}$$

$$d\varphi_z\left(\frac{\partial}{\partial x_j}\right) = \frac{\partial}{\partial u_j}, \quad d\varphi_z\left(\frac{\partial}{\partial y_j}\right) = \frac{\partial}{\partial v_j}$$