$$\begin{array}{c|c}
dy & T_pC \subseteq T_p\mathbb{R}^2 \ (:= \operatorname{span}\{\partial_x\big|_p, \partial_y\big|_p\} \\
\mathbf{v} = \begin{pmatrix} 1 \\ f'(a) \end{pmatrix} = 1 \cdot \partial_x\big|_p + f'(a) \cdot \partial_y\big|_p \\
= \frac{\partial}{\partial y}\big|_p = \partial_y\big|_p \\
p & dx
\end{array}$$