

Solution of Exercise 2.22. We have

$$\begin{aligned} T(g \circ f)(x, h) &= ((g \circ f)(x), D(g \circ f)(x)h) = (g(f(x)), Dg(f(x))(Df(x)h)) \\ &= Tg(f(x), Df(x)h) = Tg(Tf(x, h)) = (Tg \circ Tf)(x, h) \end{aligned}$$