

$$\begin{aligned}
 \mathbf{8.22} \quad (x)' &= \left( \tan(\arctan(x)) \right)' \\
 1 &= \tan'(\arctan(x)) (\arctan(x))' = 1 + \tan^2(\arctan(x)) (\arctan(x))' \\
 (\arctan(x))' &= \frac{1}{1 + \tan^2(\arctan(x))} = \frac{1}{1 + x^2}
 \end{aligned}$$