

$$\begin{aligned} (2) \quad \left(\tan^{-1} \frac{x}{a} \right)' &= \left(\tan^{-1} t \right)' \left(\frac{x}{a} \right)' \\ &= \frac{1}{a(1+t^2)} = \frac{a}{x^2 + a^2} \end{aligned}$$