

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