

$$\begin{aligned} (1) & \left(\frac{1}{2a} \log \left| \frac{x-a}{x+a} \right| \right)' \\ &= \frac{1}{2a} (\log |x-a| - \log |x+a|)' \\ &= \frac{1}{2a} \left(\frac{1}{x-a} - \frac{1}{x+a} \right) = \frac{1}{x^2 - a^2} \end{aligned}$$