

name: solution

1. Find the derivatives (4 points each)

(a)  $\ln(e^x + e^{-x})$

(b)  $\ln(2x^8)$

$$\begin{aligned} (a) \quad \frac{d}{dx} (\ln(e^x + e^{-x})) &= \frac{1}{e^x + e^{-x}} \frac{d}{dx} (e^x + e^{-x}) \\ &= \frac{1}{e^x + e^{-x}} (e^x - e^{-x}) \end{aligned}$$

(b)  ~~$\frac{d}{dx} (2x^8) =$~~

$$\begin{aligned} \frac{d}{dx} (\ln(2x^8)) &= \frac{1}{2x^8} \cdot \frac{d}{dx} (2x^8) = \frac{1}{2x^8} (16x^7) \\ &= \frac{8}{x} \end{aligned}$$