

④ b. $y = (1+e^x)^2$
 $\frac{dy}{dx} = 2(1+e^x)(e^x)$
 $\frac{dy}{dx} = 2e^x(1+e^x)$

c. $y = \sqrt{1+e^{-x}}$ or $y = (1+e^{-x})^{1/2}$
 $\frac{dy}{dx} = \frac{1}{2}(1+e^{-x})^{-1/2}(e^{-x})(-1)$
 $\frac{dy}{dx} = \frac{-1}{2e^x\sqrt{1+e^{-x}}}$

d. $y = \frac{x+e^x}{e^{-x}}$

$y = e^x(x+e^x)$

$y = xe^x + e^{2x}$

$\frac{dy}{dx} = e^x + xe^x + e^{2x}(2)$

$\frac{dy}{dx} = e^x(1+x+2e^x)$

e. $y = \frac{e^x + e^{-x}}{e^x - e^{-x}}$

$\frac{dy}{dx} = \frac{(e^x - e^{-x})(e^x - e^{-x}) - (e^x + e^{-x})(e^x + e^{-x})}{(e^x - e^{-x})^2}$

$\frac{dy}{dx} = \frac{(e^x - e^{-x})^2 - (e^x + e^{-x})^2}{(e^x - e^{-x})^2}$

$\frac{dy}{dx} = \frac{(e^x - e^{-x}) - (e^x + e^{-x})}{(e^x - e^{-x})^2} \cdot ((e^x - e^{-x}) + (e^x + e^{-x}))$

$\frac{dy}{dx} = \frac{(-2e^{-x})(2e^x)}{(e^x - e^{-x})^2}$

$\frac{dy}{dx} = \frac{-4}{(e^x - e^{-x})^2}$

C. ALTERNATE METHOD

$y = \frac{e^x + \frac{1}{e^x}}{e^x - \frac{1}{e^x}} \left(\frac{e^x}{e^x} \right)$

$y = \frac{e^{2x} + 1}{e^{2x} - 1}$

$\frac{dy}{dx} = \frac{(e^{2x}-1)(2e^{2x}) - (e^{2x}+1)(2e^{2x})}{(e^{2x}-1)^2}$

$= \frac{2e^{2x}(-2)}{(e^{2x}-1)^2}$

$\frac{dy}{dx} = \frac{-4e^{2x}}{(e^{2x}-1)^2}$

$(e^x - e^{-x})^2 = e^{-2x}(e^{2x} - 1)^2$

$(e^x - \frac{1}{e^x})^2 = e^{-2x}(e^{2x})^2 - 2e^{2x} + 1$

$e^{2x} - 2 + \frac{1}{e^{2x}} = e^{2x} - 2 + e^{-2x}$

$e^{2x} - 2 + \frac{1}{e^{2x}} = e^{2x} - 2 + \frac{1}{e^{2x}} \checkmark$

SAME ANSWER!!