

Student Name: _____

Score: _____

Derivatives of Hyperbolic Functions

Find the derivatives of hyperbolic functions:

$$y = 2 \sinh x + 8 \cosh x$$

$$y = (5 \tanh x)^2$$

$$y = 27 \coth(x + 7) - \sinh x$$

$$y = 4 \operatorname{sech} e^{2x}$$

$$y = \cosh(\cos x)$$

$$y = 18 \sinh(\sinh(x + 5))$$

$$y = \operatorname{csch}(\ln x)$$

$$y = 12 x^5 \cosh 9x$$

$$y = 7x + \tanh 3x$$

$$y = \frac{35}{4} \coth\left(\frac{2}{35}x + \frac{7}{13}\right)$$

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Answer key

Derivatives of Hyperbolic Functions

$$\frac{dy}{dx} = 2 \cosh x + 8 \sinh x$$

$$\frac{dy}{dx} = 10 \tanh x \operatorname{sech}^2 x$$

$$\frac{dy}{dx} = -27 \operatorname{csch}^2(x + 7) - \cosh x$$

$$\frac{dy}{dx} = -8 e^{2x} \operatorname{sech} e^{2x} \tanh e^{2x}$$

$$\frac{dy}{dx} = -\sin x \sinh(\cos x)$$

$$\frac{dy}{dx} = 18 \cosh(\sinh(x + 5)) \cosh(x + 5)$$

$$\frac{dy}{dx} = -\frac{\operatorname{csch}(\ln x) \operatorname{coth}(\ln x)}{x}$$

$$\frac{dy}{dx} = 60 x^4 \cosh 9x + 108 x^5 \sinh 9x$$

$$\frac{dy}{dx} = 7 + 3 \operatorname{sech}^2 3x$$

$$\frac{dy}{dx} = -\frac{1}{2} \operatorname{csch}^2 \left(\frac{2}{35} x + \frac{7}{13} \right)$$