Find the derivatives of hyperbolic functions:

\[ y = 2 \sinh x + 8 \cosh x \quad y = (5 \tanh x)^2 \]

\[ y = 27 \coth (x + 7) - \sinh x \quad y = 4 \sech e^{2x} \]

\[ y = \cosh (\cos x) \quad y = 18 \sinh (\sinh (x + 5)) \]

\[ y = \text{csch} (\ln x) \quad y = 12 x^5 \cosh 9x \]

\[ y = 7x + \tanh 3x \quad y = \frac{35}{4} \coth \left( \frac{2}{35} x + \frac{7}{13} \right) \]
Answer key

Derivatives of Hyperbolic Functions

\[ \frac{dy}{dx} = 2 \cosh x + 8 \sinh x \quad \frac{dy}{dx} = 10 \tanh x \sech^2 x \]

\[ \frac{dy}{dx} = -27 \csch^2(x + 7) - \cosh x \quad \frac{dy}{dx} = -8 e^{2x} \sech e^{2x} \tanh e^{2x} \]

\[ \frac{dy}{dx} = -\sin x \sinh(\cos x) \quad \frac{dy}{dx} = 18 \cosh(\sinh(x + 5)) \cosh(x + 5) \]

\[ \frac{dy}{dx} = -\frac{\csch(\ln x) \coth(\ln x)}{x} \quad \frac{dy}{dx} = 60 x^4 \cosh 9x + 108 x^5 \sinh 9x \]

\[ \frac{dy}{dx} = 7 + 3 \sech^2 3x \quad \frac{dy}{dx} = -\frac{1}{2} \csch^2 \left( \frac{2}{35} x + \frac{7}{13} \right) \]