

Derivative of Hyperbolic functions : Example

$$y = (\sin x)^{\sinh x}$$

$$\log y = \log (\sin x)^{\sinh x} \quad \text{Taking log Both side}$$

$$\log y = \sinh x \cdot \log (\sin x)$$

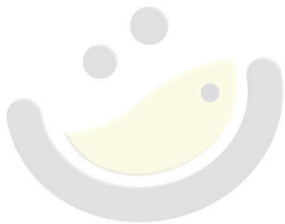
$$\frac{1}{y} \frac{dy}{dx} = \sinh x \frac{1}{\sin x} \frac{d}{dx} (\sin x) + \log (\sin x) \cdot \cosh x$$

$$= \sinh x \frac{1}{\sin x} \cdot \cos x + \log (\sin x) \cdot \cosh x$$

$$\frac{dy}{dx} = y \left[\sinh x \cot x + \log(\sin x) \cosh x \right]$$

$$= (\sin x)^{\sinh x} \left[\sinh x \cot x + \log(\sin x) \cosh x \right]$$

Ans.



OMG! MATHS!
The poetry of logical thinking