The Exponents Rule
The Logarithms Rule

Derivatives of Exponents and Logarithms

Exponent Rule

$$\frac{d}{dx}\left(a^x\right) = a^x \ln(a)$$

$$\frac{d}{dx}\left(\mathbf{e}^x\right) = \mathbf{e}^x$$

Logarithm Rule

$$\frac{d}{dx}\left(\ln(x)\right) = \frac{1}{x}, \quad x > 0$$

$$\frac{d}{dx}\left(\ln|x|\right) = \frac{1}{x}, \quad x \neq 0$$

$$\frac{d}{dx}\left(\log_a(x)\right) = \frac{1}{x\ln(a)}, \quad x > 0$$