

C12 - 2.10 - Exp Derivatives Notes

$$y' = \frac{dy}{dx} = f'(x)$$

$$y = e^x \quad y' = e^x \ln e$$

$$y = 2^x \quad y' = 2^x \ln 2$$

$$y = e^{2x} \quad y' = e^{2x} \times 2$$

$$y = 5^{3x} \quad y' = 5^{3x} \ln 5 \times 3$$

$$y' = e^x$$

$$y' = 2e^{2x}$$

$$y' = 3 \ln 5 (5)^{3x}$$

$$y = ex \quad y' = e$$

$$y = xe^2 \quad y' = e^2$$

$$y = e^{1+\ln x} \quad y = e^1 e^{\ln x}$$

$$y = ex \quad y' = e$$

$$y = e^{\text{that}} \quad y' = e^{\text{that}} \times \text{chain that}$$

$$y = a^{\text{that}} \quad y' = a^{\text{that}} (\ln a) \times \text{chain that}$$

$$y = e^x$$

$$y' = e^x$$

$$y'' = e^x$$

$$\dots$$

$$y = e^{\sqrt{x}} \quad y' = e^{\sqrt{x}} \times \frac{1}{2\sqrt{x}}$$

$$y' = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$$

$$y = e^{\ln x} \quad y' = e^{\ln x} \left(\frac{1}{x}\right)$$

$$y = e^{\ln_e x} \quad y = x \quad y' = 1$$

$$y' = \frac{e^{\ln_e x}}{x}$$

$$y' = \frac{x}{x}$$

$$y' = 1$$

Log Rules

$$y = x^2 3^x \quad y' = 2x(3^x) + 3^x \ln 3(x^2)$$

$$y = x^3 e^{2x} \quad y' = 3x^2(e^{2x}) + e^{2x}(2)(x^3)$$

$$y' = x^{3x}(2 + x \ln 3)$$

$$y' = x^2 e^{2x}(3 + 2x)$$

$$y = \frac{e^{2x}}{x}$$

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

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

$$y = e^{\sin x} \quad y' = e^{\sin x} \cos x$$

$$y = \tan(e^{\sqrt{x}}) \quad y' = \sec^2(e^{\sqrt{x}}) \times \left(\frac{e^{\sqrt{x}}}{2\sqrt{x}}\right)$$

$$y' = \frac{e^{\sqrt{x}} \sec^2 e^{\sqrt{x}}}{2\sqrt{x}}$$