DERIVATIVES OF EXPONENTIAL FUNCTIONS (§3.9)

If u is a differentiable function of x , then

$$\frac{d}{dx}\left[e^{u}\right] = e^{u} \cdot \frac{du}{dx}$$

If $a > 0$ and $a \neq 1$ and u is a differentiable function of x, then

$$\frac{d}{dx}\left[a^{u}\right] = \ln a \cdot a^{u} \frac{du}{dx}$$