

5.1

Log, Exponential, and  
Other Transcendental  
Functions (cannot be expressed in  
terms of a finite sequence  
of +, x, and √)

•  $\frac{d}{dx} \ln x = \frac{1}{x}, x \neq 0$

•  $\frac{d}{dx} \ln u = \frac{1}{u} \frac{du}{dx}$

•  $\frac{d}{dx} \log_b x = \frac{1}{x \ln b}$

•  $\frac{d}{dx} \log_b u = \frac{1}{u \ln b} \frac{du}{dx}$

•  $\frac{d}{dx} e^x = e^x$

•  $\frac{d}{dx} e^u = e^u \frac{du}{dx}$

•  $\frac{d}{dx} b^x = b^x \ln b$

•  $\frac{d}{dx} b^u = b^u \ln b \frac{du}{dx}$