

3.9 Derivatives of Exponential and Logarithmic Functions
Day 1

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

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

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

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

Ex 1) $y = e^{2x}$

$$y' =$$

Ex 2) $y = e^{-5x}$

$$y' =$$

Ex 3) $y = xe^{2x} + 2x^5$

$$y' =$$

Ex 4) $y = x^2 e^{(x^3)}$

$$y' =$$

Ex 5) $y = 9^{-x}$

$y' =$

Ex 6) $y = 3^{\cos x}$

$y' =$

Ex 7) $y = xe^2 - e^x$

$y' =$

Ex 8) $y = \ln x^2$

$y' =$

Ex 9) $y = (\ln x)^2$

$y' =$

Ex 10) $y = \ln \frac{10}{x}$

$y' =$

Ex 11) $y = x \ln x - x$

$y' =$

$$\text{Ex 12) } y = \log_5 \sqrt{x}$$

$$y' =$$

$$\text{Ex 13) } y = \log_3(1 + x \ln 3)$$

$$y' =$$