**Math 201**

**Section 6.3** Derivatives of Inverse Functions; Derivatives and Integrals Involving Exponential Functions

Differentiability of Inverse Functions

$$\frac{d}{dx}[f^{-1}(x)] = \frac{1}{f'(f^{-1}(x))}$$

Theorem Suppose that the domain of a function $f$ is an open interval on which $f'(x) > 0$ or on which $f'(x) < 0$. Then $f$ is one-to-one, $f^{-1}(x)$ is differentiable at all values of $x$ in the range of $f$, and the derivative of $f^{-1}(x)$ is given by the formula above.

Derivatives of Exponential Functions

$$\frac{d}{dx}[e^x] = e^x \quad \frac{d}{dx}[b^x] = \ln(b)b^x$$

Integrals Involving Exponential Functions

$$\int e^x dx = e^x + C \quad \int b^x dx = \frac{b^x}{\ln(b)} + C$$