

Derivatives:

$$\frac{d}{dx} [e^x] = e^x$$

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

$$1) f(x) = e^{4x^2-6}$$

$$f'(x) = e^{4x^2-6} \cdot 8x$$

*

$$2) f(x) = e^{-3/x}$$

$$f'(x) = e^{-3/x} \cdot 3x^{-2}$$
$$\frac{3e^{-3/x}}{x^2}$$

Integrals:

$$\int e^x dx = e^x + C \quad \int e^u du = e^u + C$$

$$1) \int e^{3x+1} dx$$

$$u = 3x+1$$

$$du = 3dx$$

$$\frac{1}{3} du = dx$$

$$* = \frac{1}{3} \int e^u du = \frac{1}{3} e^u + C = \frac{1}{3} e^{(3x+1)} + C$$

$$2) \int \frac{e^{1/x}}{x^2} dx$$

$$u = \frac{1}{x} = x^{-1}$$

$$du = -x^{-2} = -\frac{1}{x^2} dx$$

$$-du = \frac{1}{x^2} dx$$

$$-\int e^u du = -e^{(1/x)} + C$$