

Math 1172 Homework #4

Section 6.3* #33, 84
6.4* #29, 50

6.3* #33 $f(x) = (3x^2 - 5x)e^x$

$$f'(x) = (3x^2 - 5x)e^x + e^x(6x - 5)$$

6.3* #84 $\int \frac{(1+e^x)^2}{e^x} dx = \int \frac{1 + 2e^x + e^{2x}}{e^x} dx$

$$= \int (1 + 2e^x + e^{2x}) e^{-x} dx$$

$$= \int e^{-x} + 2 + e^x dx$$

$$= -e^{-x} + 2x + e^x + C$$

6.4* #29 $L(v) = \tan(4^{v^2})$

$$L'(v) = \sec^2(4^{v^2}) \cdot 4^{v^2} \ln 4 \cdot 2v$$

6.4* # 50

$$\int \frac{2^x}{2^x + 1} dx$$

$$u = 2^x + 1$$

$$du = 2^x \ln 2 dx$$

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

$$= \int \frac{1}{u} \cdot \frac{1}{\ln 2} du = \frac{1}{\ln 2} \int \frac{1}{u} du$$

$$= \frac{1}{\ln 2} \cdot \ln|u| + C = \frac{1}{\ln 2} \ln|2^x + 1| + C$$