Math 1172 Homework #3

Section 6.2* #16, 64

6.3* #33, 84

6.2* #16

$f(x) = x\ln x - x$

$f'(x) = x \cdot \frac{1}{x} + \ln x \cdot 1 - 1 = \ln x$

6.2* #64

$$y = \frac{(x+1)^4 (x-5)^3}{(x-3)^8}$$

$$\ln y = \ln\left(\frac{(x+1)^4 (x-5)^3}{(x-3)^8}\right)$$

$$\ln y = 4\ln(x+1) + 3\ln(x-5) - 8\ln(x-3)$$

$$\frac{1}{y} y' = \frac{4}{x+1} + \frac{3}{x-5} - \frac{8}{x-3}$$

$$y' = \left(\quad \right) \cdot y$$

$$y' = \left(\frac{4}{x+1} + \frac{3}{x-5} - \frac{8}{x-3}\right) \frac{(x+1)^4 (x-5)^3}{(x-3)^8}$$

6.3* #33

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

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

6.3* #84

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

Foil

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

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

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