Assignment #14 ***Math 180*** ***Name:***

1. Approximate the area under the curve by using L_6 *and* R_6

a) $f(x) = e^{2x}(x+1)$ *for* $0 \le x \le 1$

b) $f(x) = \ln(x+1)(x^2+1)$ *for* $0 \le x \le 2$

2. Using Riemann Sum to find the exact area under the curves:

a) $f(x) = 3x^2 - 5x + 3 \quad for \ 0 \le x \le 4$

b) $f(x) = 7x^3 - 5x + 2 \quad for \ 0 \le x \le 5$

3. Differentiate the following functions:

a) $f(x)=\int_0^{\cos^2(5x+1)}\sqrt{\frac{t^2+2t-7}{t^3+1}}dt$

b) $f(x)=\sin^5\left(\int_2^{\ln(5x^3+2)}\sqrt{t^3+2t^2+1}dt\right)$

c) $f(x)=\int_{\tan^{-1}(x^2+1)}^{0}\cos^2\left(t^3+2t^2+3\right)dt$

4. Evaluate the following definite integrals:

a) $\int_{-1}^{2} \left(3x^2 - 2\right)^2 \, dx$

b) $\int_{0}^{1} \left(\frac{3}{1+x^2} + \sin\left(2\pi x\right) \right) dx$

c) $\int_{1}^{2}\left(e^{3x+1}+3\sqrt{x^3}-2\sqrt[3]{x^5}\right)dx$

d) $\int_{-\pi}^{\pi}\left(\sec^2(3x)-\cos\left(\frac{x}{2}\right)\right)dx$