Assignment #13 ***Math 180*** ***Name:***

1. Using R_8 *and* L_8 to approximate the area under the curve over the indicated intervals.

   a) $f(x) = 3x^3 - 2x + 4$ *over* $[0,3]$

   b) $f(x) = \frac{1}{x^2+1} + 2x^2 - 3$ *over* $[-1,2]$

2. Find the exact under the curve of following functions:

a) $f(x) = 7x^3 - 2x + 4$ *for* $0 \le x \le 3$

b) $f(x) = 7x^2 - 2x - 3$ *for* $1 \le x \le 2$

3. Using geometry to evaluate the following:

a) $\int_{-1}^{4} |2x-4|\,dx$

b) $\int_{0}^{5} \left[4\sqrt{25-x^2} + 2x - 3 \right] dx$

4. Prove the following statements:

a) $0 \le \int_0^{\pi/2} x \sin x dx \le \frac{\pi^2}{8}$

b) $2 \le \int_{-1}^{1} \sqrt{1+x^2}\, dx \le 2\sqrt{2}$