MATH 122 Section 01
Homework 2

Below is a list of selected problems from Stewart's <u>Calculus</u>. You will have until the following Friday February 2 to finish the problem set. The first problems are suggested exercises and you do not need to turn them in. The latter set you should write up carefully and neatly as they will be graded. It is in your best interest to work all of the problems. All problems from the homework are fair game on the exams! You are encouraged to work in groups, but you must write up your own solutions. I will be available during office hours for help.

1 Suggested Problems

§6.3) 1, 3, 5, 7, 9, 11, 15, 17, 21, 29, 31, 37, 39

§6.4) 1, 3, 5, 11, 13, 15

§6.5) 1, 3, 5, 7, 9, 19

§7.1) 1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 25, 27, 29, 33, 35, 39, 41, 43

§7.2) 23, 25, 27, 29, 31, 33, 35, 39, 43, 47, 51, 83

2 Required Problems

1) Newton's Law of Gravitation states that the two bodies with masses m_1 and m_2 attract each other with a force

$$F = G\frac{m_1 m_2}{r^2}$$

(inverse square law) where r is the distance between the bodies and G is the gravitational constant. If one of the bodies is fixed, find the work needed to move the other from $r = a$ to $r = b$.

2) Prove the mean value theorem for integrals by applying the mean value theorem for derivatives to the function $F(x) = \int_a^x f(t)dt$.

3) Suppose g is the inverse function of a differentiable function f and let $G(x) = 1/g(x)$. If $f(3) = 2$ and $f'(3) = 1/9$, find $G'(2)$.

4) Evaluate the following integrals

$$\int_0^1 xe^{-x^2}dx \qquad \int \sec^2(x)e^{\tan(x)}dx \qquad \int \frac{e^{1/x}}{x^2}dx$$