Fall 2004 Calculus I, sections 4, 5, 6, Courant Institute of Mathematical Sciences, NYU.

Homework 12, due December 6

Self check (not to hand in, answers are in the back of the book):

Section 7.3: 1, 3, 11, 43.

Section 7.4: 1, 7, 21, 47.

Section 7.6: 3, 5, 21.

To hand in:

Section 7.3: 2, 4, 12, 42 (Hint: $\tan = \frac{\sin}{\cos}$).

Section 7.4: 2, 16, 22, 48.

Section 7.6: 2, 6, 14.

More problems (to hand in). Work these problems without using a calculator using appropriate approximations using the first derivative.

1. Estimate $f(.9)$ when $f(t) = te^t$ using the fact that $e \approx 2.718$.
2. Estimate x so that $e^{-x^2} = .95$. Hint: $e^0 = 1$. Find $s = x^2$ using linear approximations then take the square root to find x.
3. Estimate t with $t(e^t - 1) = .1$. Hint: t will be close to zero so the linear approximation to e^t should be accurate.
4. Estimate $\int_1^{1.2} \big(\ln(t)\big)^2 dt$. Hint: Approximating $\ln(t)$ near zero by its linear approximation allows us to approximate the integral by the integral of a simple function.