Homework 2:

1.   Write a program to integrate e^{-x} with x ranging [-1, +1] by the trapezoid

algorithm. Chose the number of sub-intervals, N, to be 10, 50, 100, and 200. And

compare with the analytic value. List the result as

     N   I_n – I_a   (I_n-I-a)/I_a

     …   ……   ……

where I_n and I_a are integral value from numerical and analytic method,

respectively.

2.   Modify the code in Problem 1 to use Simpson algorithm. Repeat the calculation in

Problem 1.

3.   Write a program to integrate Problem 1 using Gaussian algorithm. Just use 4 and

8 points. You need to use the subroutine 'gauleg' from Numerical Recipies to

generate $\{x_i, w_i\}$. (you can copy it from Omega:

/home/z/zh/zhang/Math3/NumRec/source/gauleg.for   )

4.   Please discuss the efficiency of the three codes.

Due: June 21, (Tuesday)