Assignment 1

B Pailthorpe, SPS
due 5pm, Wed. 31 Aug. 05.

MATH 10700 Intro to Computational Science, 2005

Provide complete written answers to the following questions. Hand it in to the labelled box outside 69-721 (Level 7 of Bldg 69 [Maths, in SPS] – its linked to Priestley, Bldg 67)) by the due date. Note that 10% of the marks are allotted on the results of this Assignment. Where the question involves writing code, provide a printout of the code. Label the printout clearly with your name & Student ID, and the question/part it belongs to. Staple all sheets together. Label the Assignment with your name& Student ID.

$\underline{Q1}$. a. Use Matlab to plot the following 2 functions over the range $[0, 2\pi]$ on the same graph, with title and labelled axes: $y1(x) = e^{-x} \cos(x)$ and $y2(x) = \ln(x + \sqrt{x})$

b. Now consider $y3(x) = \sinh(x)$; plot $y1$ and $y3$ on the same graph. What happened? Use the axis command in MatLab to get a sensible scale for the plot.

$\underline{Q2}$. Numerical Integration.
a. Plot the function $f(x) = |x|$. Use the appropriate MatLab command to evaluate, numerically using Simpson's rule, the definite integral:

$$\int_{-1}^{0.5} |x| \, dx.$$

b. Now evaluate the integral (so as to achieve an accuracy of 10^{-3}):

$$\int_{0}^{1} \exp(-x^2) \, dx,$$