BirZeit University
Faculty of Graduate Studies
Faculty of Science-Department of Physics
Special topics: Computational physics Phys736
Spring 2014
Homework#1, Due Oct. 11th 2014

1. Consider the function:

$$f(x) = \frac{1}{(\lambda + x)^\mu}$$

$\lambda > 0$ and $0 < \mu < 1$, this function has a singularity if $\lambda = 0$.

(a) Use the trapezoid and Simpson's algorithms using $\lambda = 1$ and integrating from $x_i = 0$ to $x_N = 10$, for three different values of μ. Investigate the convergence of your results as you increase the number of intervals. Use N = 1,2,4,8,16,32,64.

(b) Now let λ approaches zero, and redo the previous part for several values of λ

(c) Now let λ to be zero, and use the open integral formula, and redo the first part.

(d) Discuss the convergence and accuracy of the open integral formula.

2. Solve problems 1, 2, and 3 on pages 32 and 33

3. Solve problem 1 on page 79 and the problem at the end of page 80

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