

Assignment #2

Due *Monday, 7 February 2005*.

1. Read sections 2.2 through 2.6 (pages 6–19).
2. Do exercise 2.1 in MORTON & MAYERS (pages 54–55).
3. Reproduce figure 2.2 in MORTON & MAYERS (p. 12) using MATLAB.

Note that this figure includes both the exact solution from the Fourier series (2.11) *and* the approximate solution from the explicit scheme (2.19) of the problem (2.7)–(2.9) using initial condition (2.24).

So: First write a program that will plot a truncation of the exact solution (2.11), with the appropriate constants. (See the previous problem.) Then write a program to compute the explicit approximation. This program will step forward using (2.19) assuming a particular value for Δt ; you can fix $\Delta x = 0.05$. Now display both the exact and approximate solutions as in figure 2.2. Plot using MATLAB reasonably carefully to reproduce all the essential features of figure 2.2; use `subplot` and also `hold`.