PHYSICS 102
CLASSICAL MECHANICS LAB
FALL 2015

Assignment Seven

Due Wednesday, November 25, 7:00 pm.
Revised: Due Wednesday, December 2, 7:00 pm.

1. Write a program to solve the one dimensional diffusion equation numerically. Run your code for a delta function initial condition. Compare it with the exact solution by plotting numerical and analytic solutions together. You may have to try different choices of the space and time discretization scales to get agreement.

You may want to write your program generally, ie to allow any discretization intervals dx, dt and number of "boxes" for the density and number of time steps, but if it helps you simplify the problem in your first encounter with this sort of exercise involving arrays, etc

2. *Optional*: You are given two bars of length L. One is at temperature T_1 and the other at temperature T_2. Place them in contact to form a bar of length $2L$ and show how the temperature equilibrates. Assume the ends of the combined $2L$ bar are insulated, so no heat escapes there.