PHYS 380
QUESTIONS FOR THE WEEK OF 24 AUGUST

1. Consider the partial differential equation :

$$4\frac{\partial z}{\partial t} - 9\frac{\partial^2 z}{\partial x^2} - 5z = 0$$

on $0 \le x \le 6$ and $t \ge 0$. For boundary conditions z(0,t)=z(6,t)=0 and an initial condition

$z(x, 0) = \sin^2(\pi x / 6)$

This semester, you may always use Mathematica to determine the values of integrals (except when we do contour integration).

2. Solve the heat diffusion equation for a bar of length L and homogeneous boundary conditions (i.e., u (0, t) = u (0, L) = 0) and initial conditions :

a) $u(x, 0) = u_o \sin(2\pi x / L)$

b) $u(x, 0) = \begin{cases} 0, & 0 < x < L/3 \\ u_o, & L/3 < x < 2L/3 \\ 0, & 2L/3 < x < L \end{cases}$

3. Boas, prob 6/638

4. Go back to the Phys 301 site and read the classnote regarding solutions of Laplace' s equation in spherical coords.