This is a short assignment, with only three problems to be turned in. But, as usual, you should work all the listed problems. There will be one more assignment, which will not be collected.

Turn in starred problems Tuesday 12/8/2009.

Section 17.10: 2, 3*, 4 (c), (f), 6 (a), (c), (g)

Section 18.3: 14, 15, 19*, 29

Section 18.4: 1, 6, 8(a,b)

12.A* Here is a variant of the periodic boundary condition problem of Section 17.8: Find the eigenvalues and eigenfunctions for

$$y'' + \lambda y = 0, \quad y(0) = -y(1), \quad y'(0) = -y'(1).$$

Find also the eigenfunction expansion of $f(x) = 1$.

Comments, hints, instructions: 1. Hint for 17.10:3: Treat separately the integrals over $x > 0$ and $x < 0$.

2. Problems 14 and 29 of Section 18.3 give two different approaches to the same problem. You may find it useful to look at both of them.

3. Problem 18.3:19. I find the language of the text somewhat confusing. In the language I have used in class, I would say that:

- One first introduces the particular solution $z(x) = (x - L)^2/2L$, writes $v(x,t) = u(x,t) - z(x)$, and determines what problem $v(x,t)$ satisfies;
- For the v problem one introduces another particular solution $v_2(t)$, reducing to a problem for $v_1(x,t) = v(x,t) - v_2(t)$ which one knows how to solve.

4. In 18.4:8(b) one should use the Laplace transform (in the variable t), not the Fourier transform, although in fact one can guess the form of the solution, and then find it completely, by elementary reasoning.