Turn in starred problems Wednesday 12/7/2016.

Section 18.3: 6 (f)*, (i), (l), (m), 10 (a), (c)*, (e), 14, 15, 19*, 29*

Section 19.2: 2(a), (b), (c), 5, 8*

Hints and remarks:

1. The instructions for problem 18.3.10(c) are not too clear. The function u which appears in (10.2)–(10.4) is the **full** solution u(x,t), **not** the stationary state. That is, you must derive (10.2), go from (10.2) to (10.3) and then from (10.3) to (10,4), for the full solution $u(x,t)$. You should assume that $u(x,t)$ satisfies the given PDE and BC and also some initial condition $u(x,0) = f(x)$; the idea is to express C in terms of $f(x)$. To do this: once you have (10.4), see what it tells you at $t = 0$ and $t = \infty$.

2. In 18.3.10(e) the solution depends on whether $H = 0$, $H > 0$, or $H < 0$; you should consider all three possiblities.

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

4. 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.

5. In 13.B, separation of variables should lead to a problem for $\Theta(\theta)$ which is familiar; you don't have to rederive its solution. In solving the Sturm-Liouville problem for $R(r)$ you may as needed make convenient assumptions about the sign of the eigenvalues, as in the notes.

6. Notice that the text's hints for 19.2.8 follow exactly the method for inhomogeneous problems that we have discussed: y_p is a particular solution depending only on x.