Due: Wed 8 April 2009

Reading:

Mon 3/31: Townsend Sec. 3.5.

Wed 4/1 and Fri 4/3: Townsend Sec. 4.1.

Mon 4/6 and Wed 4/8: Townsend Sec. 4.2, French & Taylor handout

Problems:

1. **Energy measurement and probability.** Townsend Problem 3.5. In the description of this problem, the arguments of \( \Psi(x,t) \), \( \psi_1(x) \) and \( \psi_2(x) \) were not given. Please interpret the equation as

   \[
   \Psi(x,0) = \frac{i}{2}\psi_1(x) + \frac{\sqrt{3}}{2}\psi_2(x).
   \]

2. **Energy measurement and time-dependence of the wavefunction.** Townsend Problem 3.6. As in the previous problem, please interpret \( \Psi(x) \) as \( \Psi(x,0) \).

3. **Expansion of a wavefunction in a basis of energy eigenfunctions.** Townsend Problem 3.9.

4. **Particle in a box that suddenly doubles in size.** Townsend Problem 3.12. Please assume that the box doubles in size so quickly that the wavefunction doesn’t have time to change. Therefore, your task is to expand the initial wavefunction \( \Psi(x,0) = \psi(x) \) in the new basis of energy eigenfunctions \( \psi_n(x) \) corresponding to a box of length \( 2L \).

7. **Feedback.** By Wednesday, please send me an email message to provide feedback on the class and on your reading. (My email address is mbschulz at brynmawr.edu). For example: Which parts were easier or harder to understand? Do you have any questions that you would
like to clarify or areas where you would like more practice in recitation section? Was there something that you found particularly interesting or uninteresting? As you know, we are using a prepublication version of the textbook. If you have any thoughts on how to improve the textbook for future students taking this class, please let me know and I will pass that information on to John Townsend.