Physics 214: Introduction to Quantum Mechanics
Spring 2016

Problem Set 8

Due: Fri 1 April 2016

Reading:

Mon 3/28: Townsend Sec. 4.6

Wed 3/30: Class notes on transmission and reflection.

Fri 4/1: Townsend Sec. 4.7.

Mon 4/4: Townsend Sec. 4.3.

Wed 4/6: Townsend Sec. 5.2.

Fri 4/8: Townsend Secs. 5.3 and 5.4.

Reminder: Exam 2 will be distributed on Friday 1 April. It is a closed book 2.5 hour take-home exam, but you may prepare one page of notes (front and back) to use during the exam. It will be due on Wed 6 April in class. The exam will cover the material through Problem Set 7, which corresponds to the textbook through the end of Chapter 3 plus the lecture notes on position and momentum space wavefunctions.

Problems:

1. **Discrete or continuous spectrum?** Townsend Problem 4.2.

2. **Constructing qualitative plots of the wavefunction I.** French & Taylor Problem 3.15.

3. **Qualititative plots II: Potentials from wavefunction.** French & Taylor Problem 3.16.

4. **Which is the correct potential?** Townsend Problem 4.5.
5. **Semi-infinite square well and its relation to a finite square well.** Townsend Problem 4.9. This problem illustrates a common trick: the odd wave functions of an even potential vanish at the origin. Thus, they satisfy the boundary conditions on $\psi(x)$ at $x = 0$ in the related problem in which the $x \leq 0$ portion of the potential is replaced by $V = \infty$. (Hints: Please see the scanned hints for this problem posted on the Calendar & Assignments page, and ignore the dates, which are from a previous year.)

6. **Feedback.** By Monday 4 April, 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? Was the problem set of reasonable length and difficulty. If you have any thoughts on how to improve the textbook for future students using future editions, please let me know and I will pass that information on to the author, John Townsend. The purpose of the feedback is to help you to reflect on your learning process and to provide me with brief but valuable information that will help to make this class the best possible experience for everyone.