Physics 214: Introduction to Quantum Mechanics
Spring 2015

Problems for Recitation Section

Date: Thu 05 Mar 2015

Problems:

1. **Probabilities and expectation value of energy.** Townsend 3.4. The wavefunction
for a particle in a box is

\[ \Psi(x,0) = \sqrt{\frac{2}{3}} \psi_1(x) + \sqrt{\frac{1}{3}} \psi_2(x) \]

at \( t = 0 \),

where \( \psi_1(x) \) and \( \psi_2(x) \) are the ground state and first excited state wavefunctions with energies \( E_1 \) and \( E_2 \). What is \( \Psi(x,t) \)? What is the probability that a measurement of the energy yields \( E = E_n \)? What is \( \langle E \rangle \)? How would you go about testing these predictions?