Physics 3310 Quantum Physics Fall 2009 - Problem Set 7

Due Wednesday, November 4

1. Question 5.3

2. Question 5.4

3. Question 5.5 (a) and (b) only

4. The ground-state energy of a particle in an infinite one-dimensional well is 3.3 eV. If the width of the well is doubled, what is the new ground-state energy? What is the new ground-state energy if instead the width of the well is halved?

5. An electron is trapped in an infinitely deep one-dimensional well with width 0.5 nm. Initially, the electron occupies the $n = 3$ state. (a) Suppose the electron jumps to the ground state with accompanying emission of a photon. What is the energy of the photon? (b) Find the energies of other photons that might be emitted if the electron takes other paths between the $n = 3$ state and the ground state.