Exam 2 Thursday

Monday, November 23, 2015 10:16

a) Solve eigenfunctions, energy spectrum of bound states, transmission/reflection of scattering states of the Hamiltonians:
- i) infinite square well (§2.2)
- ii) harmonic oscillator (§2.3)
- iv) δ-potential (§2.5)
- iv) finite square well (§2.6)
- v) step potential (prob #2.34)
- vi) 2-state system (in class)

b) Calculate time-evolution $|\Psi(x,t)\rangle$ of an initial state $|\Psi(x,0)\rangle$ under a Hamiltonian $\hat{H}$

c) Calculate the probability of measuring an observable $\hat{Q}$ (find its spectrum $q_i, |\psi_i\rangle$) in the state $|\psi\rangle$, and calculate expectation values. Describe what would happen to the probabilities when subsequently measuring the same or a different observable.

d) recognize compatible observables $[\hat{A},\hat{B}]=0$ and conserved quantities $[\hat{H},\hat{A}]=0$.