1. A particle is described by wavefunction: $\phi = A\exp(-\alpha x^2)$. Find the potential energy V (x) with V(0)=0. And what is the energy of the particle?

2. An electron in an infinitely deep potential well is excited from the ground state (n=1) to the 5^{th} state (n=5), then returns to the ground state by emitting a photon. The wavelength of the photon is 6000 angstrom. What is the width of the potential well?

3. Consider a potential: $V(x)=V_0$ for $|x|>L/2$; $V(x)=0$ for $|x|<L/2$. Solve for the energy of the particle in such potential (use similar graphic method as discussed in the class when solving the boundary conditions). Roughly sketch the shape of the wavefunctions.