1. Read Griffiths section 5-3. Did you read all the pages?
2. Consider an electron in the hydrogen ground state.
   (a) What is the energy in symbols and numerically?
   (b) Write the time-dependent wavefunction $\Psi(\vec{r}, t)$.
   (c) Plot the magnitude of the wavefunction versus r.
   (d) What is the probability density for this state?
   (e) Plot the probability density versus r. Mark the location of the Bohr radius.
   (f) What is the most probable r in terms of the Bohr radius?
   (g) What is the average $< r >$ in terms of the Bohr radius?
   (h) What is the probability of finding the electron beyond the Bohr radius?
   (i) What is the probability of finding the electron inside the proton?
3. Consider the Earth and Sun as a gravitational analog to the hydrogen atom's electron and proton.
   (a) Compare the potential energies for the two systems. What replacement of symbols will change hydrogen to the Earth-Sun sysyem?
   (b) What is the Bohr radius for the Earth-Sun sysyem?
   (c) What is the quantum number n of the Earth roughly?

Bonus:

1. Find $< x^2 >$ in the hydrogen state $n = 2$, $\ell = 1$, $m = +1$.