**Problem E14:**

Find the following quantities for an electron in the ground state of hydrogen:

(a) The expectation value of $r$.

(b) The expectation value of the potential energy $V = -\dfrac{e^2}{4\pi\epsilon_0}\dfrac{1}{r}$. (Note that $\langle\frac{1}{r}\rangle$ is not the same as $\frac{1}{\langle r\rangle}$.)

(c) The expectation value of the kinetic energy. Here you can make use of the fact that $\langle KE\rangle + \langle V\rangle = E$.