

Recitation #5
Quantum 522

1. Ignoring the fine structure, Show that the first order correction to the ground state of hydrogen due to the Stark effect (hydrogen atom in static, uniform electric field) vanishes. Show that the only non-vanishing $n = 2$ matrix elements are $\langle 2, 1, 0 | \hat{H}_1 | 2, 0, 0 \rangle = \langle 2, 0, 0 | \hat{H}_1 | 2, 1, 0 \rangle$.
2. Use the variational method and a triangular wave function to estimate the ground state of an infinite 1-D square well. Compare to the exact answer.