Physics 216. Quantum Mechanics. Professor Dine

Spring, 2004. Homework Set 2. Due Tues., May 4.

Make sure that you read Sakurai, sections 5.5-5.7 (Time-dependent perturbation theory, including interaction with the electromagnetic field); also Shankar, chapter 18. Note that Shankar treats the Bohm-Aharanov effect in section 18.4.

1. Show that the WKB approximation gives the correct energy levels for the harmonic oscillator.
2. Use the WKB approximation to show that an attractive three dimensional potential that falls off like r^{-n} for large r has an infinite number of bound states only if $n \leq 2$.
3. Sakurai 2.15
4. Sakurai 2.31
5. Sakurai 5.25
6. Sakurai 5.30
7. Sakurai 5.33