Physics 162b, Winter/Spring 2007 – Problem Set 5

Due in class Friday, March 9.

1. Shankar, problem 16.2.6

2. Using the WKB approximation for barrier penetration, calculate the probability of a 1d electron escaping off of the surface of a metal in the presence of a strong electric field. One may take the metal to reside at $x < 0$ and the potential inside the metal to be a constant negative energy $-V_0$. For $x > 0$ the potential is that induced by a constant electric field, $V(x) = -Ex$. Determine the limits of applicability of the problem.