

August 31, 2010

**PHY 741 – Problem Set #3**

Continue Chapter 2 in **Mahan**; homework is due Friday, September 3, 2010.

Consider a particle of mass  $m$  moving in one dimension in a finite potential well:

$$V(x) = \begin{cases} -V_0 & \text{for } -L/2 \leq x \leq L/2 \\ 0 & \text{otherwise.} \end{cases}$$

In terms of the length parameter  $L$ , the constant potential has the value

$$V_0 = 16 \frac{\hbar^2}{2mL^2}.$$

Solve the Schrödinger equation to find at least one (extra credit for two) bound-state eigenfunction and eigenvalue for this particle. If you are using Maple to solve the equations, you might take advantage of “*fsolve*”.