Problem Set 5
PHY 465 - Spring 2015
Assigned: Friday, Feb. 27 Due: Friday, Mar. 6

Reading: Shankar Ch. 16

Problems 1-3: The Variational Method

Shankar 16.1.1-3

Problem 4-8: The WKB method

Shankar 16.2.1,4,5,7,8

Problem 9: Additional WKB Problem

Redo Problem 16.2.7, but with the potential

$$V(x) = \begin{cases} \infty & x \leq 0 \\ \frac{1}{2}m\omega^2 x^2 & x > 0 \end{cases}$$

Derive the expression for the energy levels in two ways: 1) using the correct WKB quantization condition, and 2) arguing that eigenfunctions of the Hamiltonian with potential $V(x)$ correspond to the **odd-parity** eigenfunctions of the harmonic oscillator (for $x > 0$), then using the results for the harmonic oscillator obtained in 16.2.7.

Please write down how many hours you spent on this problem set.