

# Physics 621 Homework Assignment 7

due Tuesday December 1 2009

Unless otherwise indicated, the problems are from the textbook (Merzbacher, 3rd edition).

1. Merzbacher Exercise 7.2 (page 120).
2. Merzbacher Exercise 7.6 (page 125). When you comment on the comparison of the plots of the exact and the WKB solutions, see if you can find evidence that the WKB is a “semiclassical” approximation.
3. Use the WKB approximation to find the transmission coefficient for the potential:

$$V(x) = V_0 \left(1 - \frac{x^2}{a^2}\right) \quad -a \leq x \leq a$$
$$V(x) = 0 \quad \text{elsewhere}$$

where  $V_0$  and  $a$  are constants. Comment on the behavior of this result for energies  $E$  near  $V_0$ .

4. Merzbacher Problem 7-1 (page 134).