

PHYS 4073 - Quantum Mechanics- Homework Set 2

Reading Assignment: Chapter 2, TISE, free particles, infinite square well, and delta function potentials

Due at the beginning of class Friday September 10th

Griffiths' Problems

2.4

2.5

2.7

2.8

2.21

2.37 - I'm totally annoyed to be assigning this question but there is not another trig function that does the right stuff.

Additional Problems

Problem A1 - Nano-Wells Wikipedia defines a quantum dot as a structure from 5nm to 50nm. What is the lowest energy state for an electron trapped in a 5nm and a 50nm quantum dot treating each as a one-dimensional infinite square well? What is the wavelength of the photon emitted by a transition from the first excited state to the ground state of each well? In what part of the spectrum does the photon fall?

Problem A2 - Stationary States Consider the wave function $\psi(x,0) = A \exp(-ax^2)$. For what potential is this function a stationary state and with what energy?