Problem 1: Tipler 6-3

Problem 2:
Suppose we consider a particle, such as an electron confined to a shoebox. To simplify, let's just consider the particle to be moving in one dimension (back and forth along x). We will confine the particle to a box of 2 m in length. If the wavefunction that describes the particle is given (inside the box) by

\[ \Psi(x, t) = \sqrt{\frac{\pi}{2}} \sin(\pi x) e^{i3\omega t} \]

Outside the box the wavefunction is zero.

a) What is the probability for finding the particle in region between 1 m and 1.1 m? Do this two ways: by an integral and by a simple approximation to an integral. How do the two results compare?

b) Sketch the probability density for the electron described by this wavefunction.