- 1. Show that the wave function $\Psi(x,t) = A\sin(kx \omega t)$ does not satisfy the time-dependent Schrodinger equation.
- 2. Show that $\Psi(x,t) = A\cos(kx \omega t)$ + iA sin(k x omega t) satisfies the time-dependent Schrodinger equation.

Solution:

6-9

A particle is in a infinit spalar well of width L. Calculate the ground-state energy if:

- 1. The particle is a protomo and L=0.1 nm. a typical size for a molecule;
- 2. the particle is a proton and $L=1 \mathrm{fm}$, a typical size for a nucleus.

Solution:

6-12

A mass of 10^-6 g is moving with a speed of about 10^-1 cm/s in a box of length 1cm. Treating this as a one-dimensional infinite square well, calculate the approximate value of the quantum number n

Solution:

6-16

The wavelength of light emitted by a ruby laser is 694.3nm. Assuming that the emission of a photon of this wavelength accompanies the transition of an electro from the n=2 level to the n=1 level of an infinite square well, compute L for the well.

Solution: