

## Chapter 44 Quantum Mechanics in 1 D (Examples) (SM06)

Example 1: Show that the wavefunction  $\varphi = A \cos(kx) + B \sin(kx)$  is a solution of the time independent Schrodinger wave equation for a particle trapped in an infinitely deep potential well. ( $0 < x < L$ )

Example 2: An electron is confined to a  $1 \times 10^{-10}$  m box. What is the wavelength of the photon that is emitted when an  $n = 2$  to  $n = 1$  transition occurs?

Example 3: Determine  $n$  for a baseball ( $m = 0.14$  kg) that is trapped in an infinitely deep square well. The ball's speed is  $0.02$  m/s and the well is  $0.25$  meters wide.

Example 4: Determine the normalization constant for an infinitely deep square well.

Example 5: An electron is trapped in  $0.3$  nm wide well. What is the probability of finding the particle within  $0.1$  nm of the left-hand boundary?