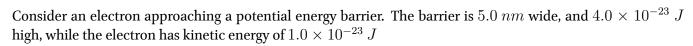
Quiz 7.4 – Translational Motion

Name:
Particle in a Box
Consider a H atom confined in a box with $L=1.5\ nm$. Model this system as a particle in a box. For each of the first three energy levels, draw the wavefunction and give the energy. Point out any nodes on your drawn wavefunctions.
Find an expression for the spacing between energy levels for a particle in a box $(E_{n+1} - E_n)$, and describe its trend, if any.
Quantum Well
Consider a particle confined to a 2-dimensional box. This system is commonly called a <i>quantum well</i> . If the two sides are equal in length, give the energies and degeneracies to the first four energy levels of this quantum system

Tunneling



What will be the probability that the electron is transmitted through the barrier?

Sketch this system below, showing both the potential energy and the electron wavefunction in qualitative terms.