

## Tutorial 5: Modern Physics

1. An electron is confined in an infinite well of 30 cm width.
  - (a) What is the ground-state energy?
  - (b) In this state, what is the probability that the electron would be found within 10 cm of the left-hand wall?
  - (c) If the electron instead has an energy of 1.0 eV, what is the probability that it would be found within 10 cm of the left-hand wall?
  - (d) For the 1-eV electron, what is the distance between nodes and the minimum possible fractional decrease in energy?
2. A 50 eV electron is trapped in a finite well. How “far” (in eV) is it from being free if the penetration length of its wave function into the classically forbidden region is 1 nm?