PHY 3106, Fall 2017, Homework #7
due Tuesday, Nov. 14, at 9:30 am (beginning of class)

1.) The squared momentum, p2, for a particle in a box is a "sharp" observable (e.g., has a precise value). However the momentum is NOT sharp, but "fuzzy". How can this be so? How does this relate to the classical motion of a particle?

2.) A free electron has the wavefunction $\psi(x) = Ae^{i(1.58 \times 10^{12}x - 7.91 \times 10^{16}t)}$ where x is measured in meters and t is in seconds. Find: a) the electron's de Broglie wavelength. b) the electron's momentum, and c) the electron's energy in units of electron volts.

3.) A particle has the wavefunction $\psi(x) = Axe^{-x^2/L^2}$ where A and L are constants. Find a) the potential energy U, as a function of x, and b) sketch $U(x)$.