ELEG240- Spring, 2006
Homework 6
Due 4/12, noon

1. Light with wavelength λ is incident upon a diffraction grating nearly parallel, that is, along the x-axis in figure 6.B.1. What does the period of the grating need to be to reflect a beam back in the opposite direction to the incident light?
2. For light with a wavelength of 10 microns in free space, what is the photon energy in both joules and electron volts? For light with a wavelength of 1 micron in free space, what is the photon energy in both joules and electron volts?
3. Apply Schrodinger's Equation to the problem of an electron wavefunction in a one-dimensional box with infinite sides, that is, treat only one dimension where the potential energy is zero from $-L/2 < z < L/2$, and it is infinite otherwise. Think what an infinite potential energy implies about the probability of finding an electron outside the box and what this means the wavefunction must be outside the box.