Homework 12   due 1 Dec. 2006 5pm
PH462 EM Waves and Optical Physics   posted: 22 Nov. 2006

1) Find the Fourier transform of a decaying series of exponentials: $f(t) = \sum_{n=0}^{\infty} \delta(t - nt_0) \exp[-\alpha n]$.

   How can this result be used to understand the Fabry-Perot interferometer? Describe how t_0 and α relate to the physical parameters of the Fabry-Perot.

2) HM 11-14.

3) A beam of white light is directed at normal incidence on a transmission diffraction grating, and the diffraction orders -2, -1, 0, 1, 2 are observed on a screen. Calculate the diffraction angles of 400nm and 700nm for these orders and use them to sketch the visible portion of what you would observe on the screen. Estimate the groove density of the grating (lines/mm) with the knowledge that these are the only diffraction orders visible.

4) HM 11-16
5) HM 11-18
6) HM 11-19
7) HM 12-8
8) HM 12-14