Physics 611, Fall 2014

**Problem set #2 (due September 30)**

1. Jackson 7.6
2. Jackson 7.8
3. A linearly polarized monochromatic plane wave falls normally from vacuum to a semi-infinite slab of transparent material of refractive index $n_2$. A uniform layer of thickness $d$ made of another transparent material with refractive index $n_1$ is placed on the boundary. Find the resulting reflection coefficient $R$ (i.e. the fraction of the incident intensity that is reflected back to vacuum), and determine at what conditions the reflection disappears (this is how the anti-reflection coatings work). The wavelength of the radiation in vacuum is $\lambda_0$.

4. Determine the complex vector amplitude of a plane electromagnetic field for each set of Stokes parameters given below. In each case please state if polarization is linear, circular or elliptical, and sketch how it looks like.
   a. $S_0=3, S_1=2, S_2=-2, S_3=1$
   b. $S_0=5, S_1=-3, S_2=0, S_3=4$
   c. $S_0=25, S_1=24, S_2=-7, S_3=0$
5. Jackson 7.22
6. Jackson 7.23