Phys 3820, Fall 2009
Problem Set #5, Hint-o-licious Hints

1. *Griffiths*, **11.3** This is certainly not hard using the completeness of the Legendre polynomials, but just do the (simple) algebra.

2. *Griffiths*, **11.6** Use (11.46) to relate δ_l and a_l but use the form

$$a_l = \frac{1}{k} e^{i\delta_l} \sin(\delta_l) = \frac{1}{k} (\cos\delta_l \sin\delta_l + i \sin^2\delta_l$$

and equate the real and imaginary parts. (Use the definition of $h_l^{(1)}$.)

3. *Griffiths*, **11.19** Use (11.47) to evaluate $f(0)$, using the fact that $P_l(1) = 1$ for all l. Use

$$e^{i\delta_l} = \cos\delta_l + i \sin\delta_l$$

and compare the result with (11.48)

4. For 5.0 MeV alpha particles incident on a gold nucleus (assume no recoil) make a rough sketch of $D(\theta)$ as given by Eq. (11.11)