Homework 6 **Due:** Start of class, November 30th

1. Griffiths problem 5.24 (4th Edition; called 5.23 in the 3rd Edition) **[4pts]**
   Hints: $\vec{B} = \vec{\nabla} \times \vec{A}$ in cylindrical coordinates: $\left(\frac{1}{s}\frac{\partial A_z}{\partial \varphi} - \frac{\partial A_\varphi}{\partial z}\right)\hat{s} + \left(\frac{\partial A_s}{\partial z} - \frac{\partial A_z}{\partial s}\right)\hat{\varphi} + \frac{1}{s}\left(\frac{\partial (sA_\varphi)}{\partial s} - \frac{\partial A_s}{\partial \varphi}\right)\hat{z}$.

2. Griffiths problem 5.25 (4th Edition; called 5.24 in the 3rd Edition) **[9pts]**
   Hints: Consult the product rules from your youth (Lecture 2). Note that "Uniform" $\vec{B}$ mans that it has no gradient, divergence, or curl.

3. Griffiths problem 5.35 (4th Edition; called 5.34 in the 3rd Edition) **[5pts]**

4. Griffiths problem 6.1 **[8pts]**
   Hints: Use the result from problem #3b from this homework for $\vec{B}_{loop}$. Recall that for a spherical to cartesian coordinate conversion, $\hat{\theta} = \cos(\theta)\cos(\varphi)\,\hat{x} + \cos(\theta)\sin(\varphi)\,\hat{y} - \sin(\theta)\hat{z}$