1. [5 points] Griffiths 2.14 (electric field for sphere with charge density $\rho(r) = kr$).

2. [5 points] Griffiths 2.16 (coaxial cable).


4. [5 points] Suppose that there is an electric potential $V(s, \phi, z) = As - Bz^3$ when expressed in cylindrical coordinates, where $A$ and $B$ are some constants. Continuing to work in cylindrical coordinates:
   (a) Find $E(r)$ using (2.23).
   (b) Find $\rho(r)$ using (2.14).
   That is, express $E_s$, $E_\phi$, and $E_z$ in (a), and $\rho$ in (b), as functions of $s$, $\phi$, and $z$. 

Note that you are not “responsible” yet for the curl ($\nabla \times$), Stoke’s theorem, etc. However, you may wish to preview these things a bit by skimming 1.2.5 and 1.3.5 now.

Note: There will be a brief quiz at the end of class on Thu. 9/27. You can expect a Gauss’s law problem.