Assignment Eight, Due Monday, March 19, noon.

[1.] A point charge $q$ is located at position $(x, y, z) = (0, 0, d)$. The dielectric constant is $\epsilon_1$ for $z > 0$ and $\epsilon_2$ for $z < 0$. Compute the potential and electric fields at all points in space. Sketch the electric field lines. Hint: The method of images is useful, as in the problem of a point charge near an infinite metallic plane. However, note the boundary conditions are different from that situation, where the electric field must be perpendicular to the surface.

[2.] Griffiths 4-02.

[3.] Griffiths 4-11.

[4.] Griffiths 4-18.

[5.] Griffiths 4-26.

[6.] Griffiths 4-31.

[7.] Extra credit: A sphere of dielectric constant $\epsilon$ is placed in a uniform external electric field. Compute the potential everywhere in space, as well as the volume(surface) polarization charges within(on) the sphere.