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1. Griffiths 4.15
 2. There is a point charge q at the center of a spherical bubble of vacuum of radius a in a linear dielectric with permittivity ϵ .
 - (a) Find the displacement field $\vec{D}(\vec{r})$ everywhere.
 - (b) Find the electric field $\vec{E}(\vec{r})$ everywhere.
 - (c) Find the scalar electric potential field $V(\vec{r})$ everywhere.
 - (d) Find the polarization field $\vec{P}(\vec{r})$ everywhere.
 - (e) Find the bound surface charge density σ_b on the surface of the sphere.
 - (f) Compare this to the free surface charge density that would be attracted to the surface of the sphere if the bubble were in a conductor. Does the limit $\epsilon \rightarrow \infty$ make sense?