Homework 6.

1) Two point charges in a dielectric medium where $\varepsilon_r = 2.8$ interact with a force of 0.02 N. What force could be expected if the charges were in free space?

2) Find the capacitance of an isolated conducting spherical shell of radius b.

3) Find the capacitance of a coaxial capacitor of length L, where the inner conductor has radius a, and the outer has radius b.

4) Find the capacitance of a parallel-plate capacitor containing two dielectrics, $\varepsilon_{r1} = 1.5$ and $\varepsilon_{r1} = 3.5$, each comprise one-half the volume, as shown in Fig.1. Here $A_1 = A_2 = 1m^2$ and $d = 10^{-3} m$
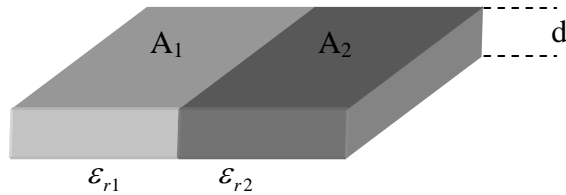

A_1 A_2 d

ε_{r1} ε_{r2}

Fig.1.