From Griffiths: 4.15, 4.18, 4.21, 4.24, 4.27, 4.32, 4.36

1. A parallel plate capacitor has a plate separation of d_1 and is filled with a dielectric material with a permittivity of ϵ. The capacitor is charged to a potential difference of V_1 and then disconnected from the power supply. The plates of the capacitor are then pulled apart, leaving a distance of d_2 between the plates. The air gap between the plates is then $d_2 - d_1$. Assume that the dimensions of the plates are large compared to d_2. Find the potential difference between the plates.