5. The electric field produced by an infinite sheet of charge has magnitude $E = \sigma/2\varepsilon_0$, where σ is the surface charge density. The field is normal to the sheet and is uniform. Place the origin of a coordinate system at the sheet and take the x axis to be parallel to the field and positive in the direction of the field. Then the electric potential is

$$V = V_s - \int_0^x E\,dx = V_s - Ex \ ,$$

where V_s is the potential at the sheet. The equipotential surfaces are surfaces of constant x; that is, they are planes that are parallel to the plane of charge. If two surfaces are separated by Δx then their potentials differ in magnitude by $\Delta V = E\Delta x = (\sigma/2\varepsilon_0)\Delta x$. Thus,

$$\Delta x = \frac{2\varepsilon_0\,\Delta V}{\sigma} = \frac{2\left(8.85\times10^{-12}\,\mathrm{C^2/N\cdot m^2}\right)(50\,\mathrm{V})}{0.10\times10^{-6}\,\mathrm{C/m^2}} = 8.8\times10^{-3}\ \mathrm{m}\ .$$