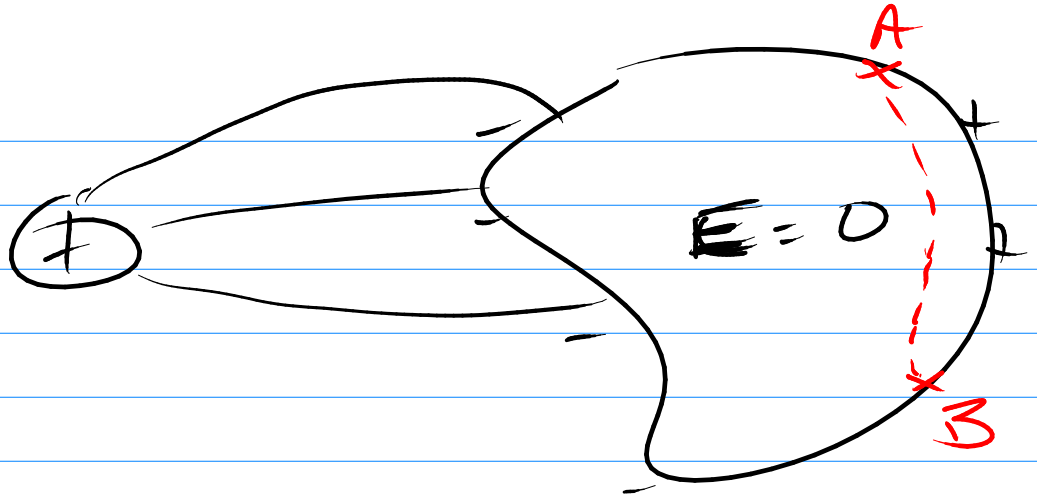
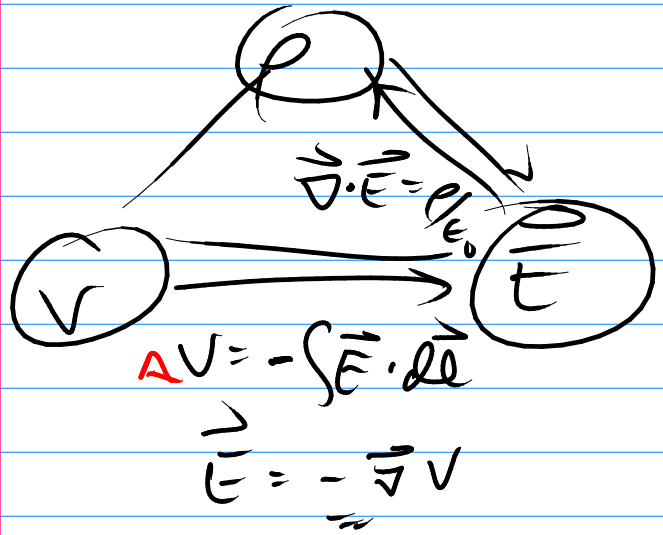
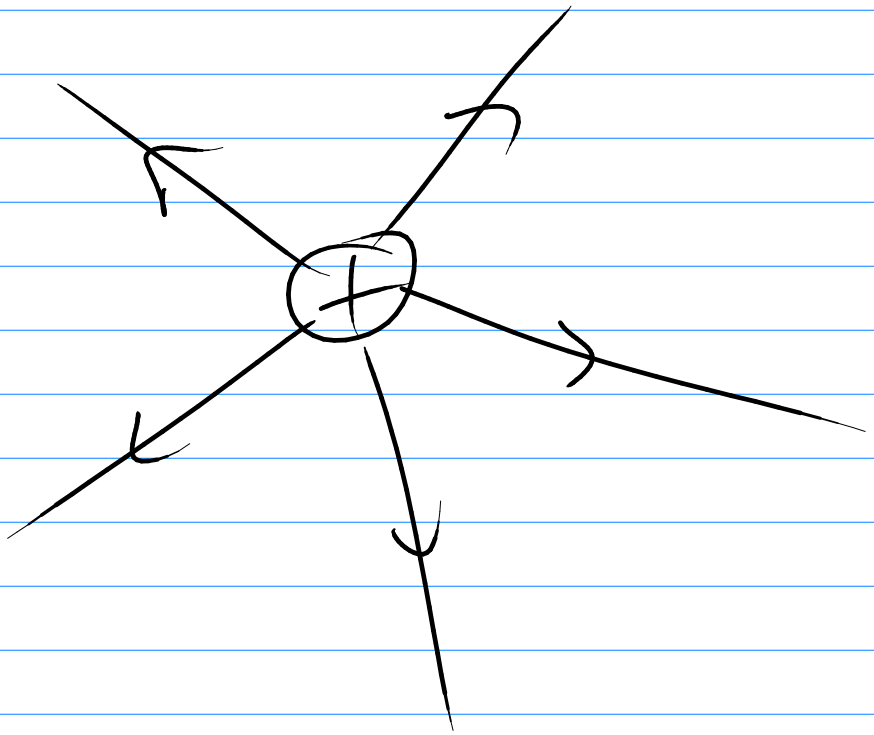


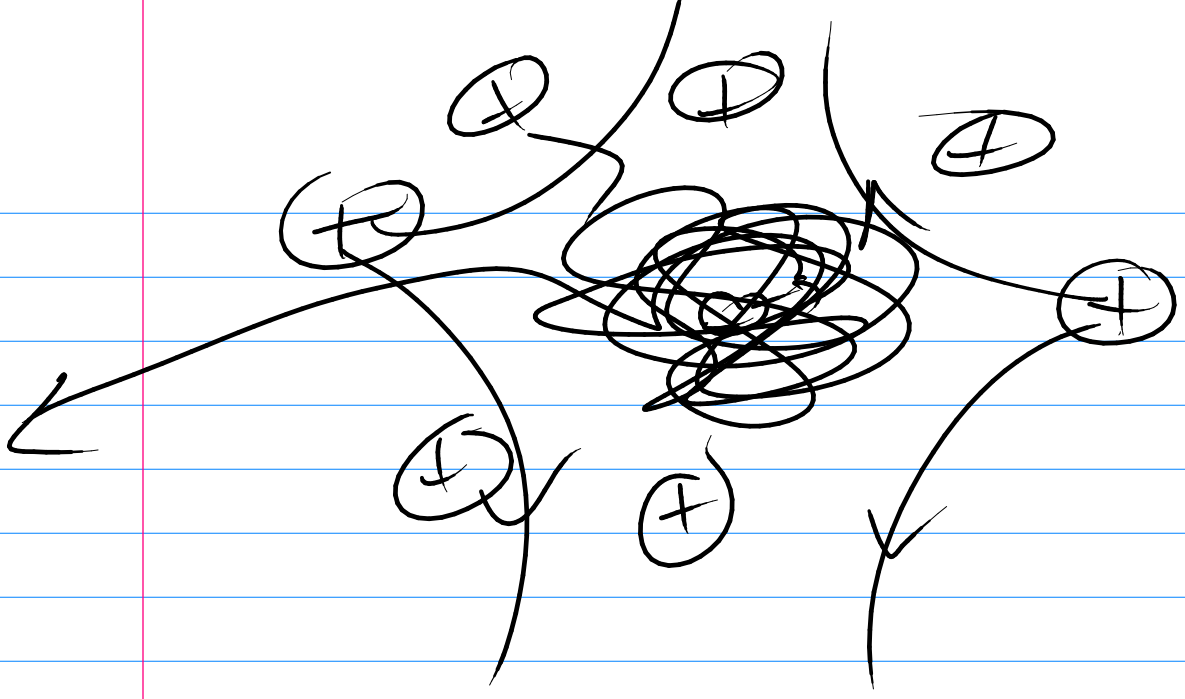


→ V on bndry is given

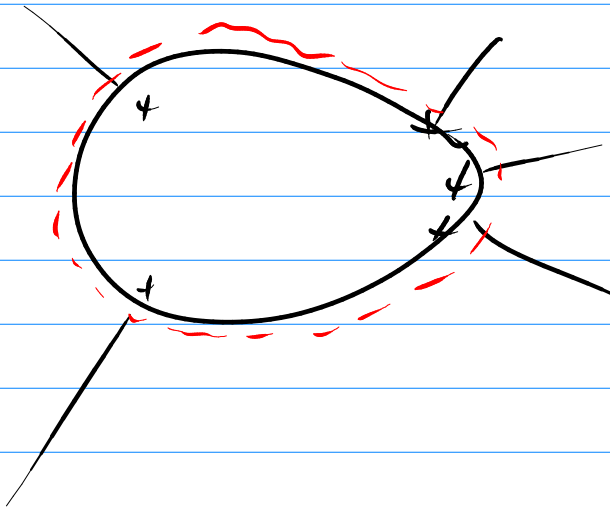
→ Gauss's law

$\vec{\nabla}\cdot\vec{E} \Rightarrow \boxed{\nabla^2 V = -\rho/\epsilon_0}$



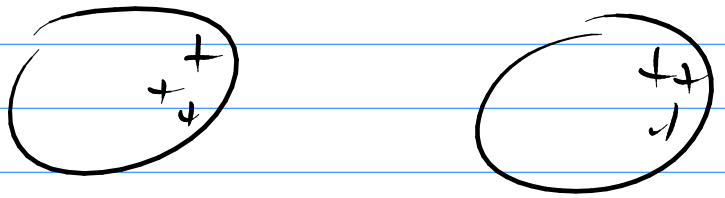


$$\oint \vec{E} \cdot d\vec{a} = \frac{Q_{in}}{\epsilon_0}$$



$$\oint E \, da \cos\phi$$

$$\sum_i E_i \, da_i$$



$$W_{nc} = \left(KE + PE\right)_f - \left(KE + PE\right)_i$$

$$PE = \frac{1}{2}\int \rho V \quad \text{or} \quad \int \rho V \quad \frac{1}{2}\int \epsilon_0 E^2 d\tau$$

$$\frac{1}{2}\epsilon_0 \int \left(\vec{E}_1 + \vec{E}\right) \cdot \left(\vec{E}_1 + \vec{E}_2\right) \, d\tau$$