

Things to know for exam

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

$$\vec{F} = q\vec{E} \quad U = qV$$

$$\vec{E} = \frac{1}{4\pi\epsilon_0} \int \frac{\hat{r} dq}{r^2}$$

$$\nabla \cdot \vec{E} = \rho / \epsilon_0$$

$$\vec{E} = -\nabla V$$

$$V = \int_a^b \vec{E} \cdot d\vec{\ell}$$

$$V = \frac{1}{4\pi\epsilon_0} \int \frac{dq}{r}$$

How to draw a Gaussian surface.

How to calculate Q_{enc} for lines, planes, cylinder, spheres

How to calculate $\vec{r}$, $\hat{r}$

How to evaluate dq for lines, planes, solids

Behavior of conductors and field lines

Gauss's Law for charges in and out of surfaces

Flux

How to calculate with $\vec{a}$ δ fn

Why $\nabla \times \vec{E} = 0$, $\oint \vec{E} \cdot d\vec{\ell} = 0$, $\vec{E} = -\nabla V$

$\int_a^b \vec{E} \cdot d\vec{\ell}$ is path independent and equivalent

$Q = CV$ How to go from Q to V to C