PHYSICS 2426 Fall 2019
Equation Sheet Exam 1

$\epsilon_0 = 8.85 \times 10^{-12}\ \mathrm{C^2/N{\cdot}m^2}$ $e = 1.602 \times 10^{-19}\ \mathrm{C}$ $m_e = 9.11 \times 10^{-31}\ \mathrm{kg}$

$V_{sphere} = \frac{4}{3}\pi R^3$ $A_{sphere} = 4\pi R^2$

$\lambda \equiv \frac{dq}{dl}$ $\sigma \equiv \frac{dq}{dA}$ $\rho \equiv \frac{dq}{dV}$

$\vec{r} = \vec{r}_f - \vec{r}_s$ $\hat{r} = \frac{\vec{r}}{r}$

$\vec{E}_{\text{point}} = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\hat{r}$ Continuous Distribution of Charge: $\vec{E} = \frac{1}{4\pi\epsilon_0}\int \frac{dq}{r^2}\hat{r}$

$E_{\text{inf plate}} = \frac{\sigma}{2\epsilon_0}$ $E_{\text{par plates}} = \frac{\sigma}{\epsilon_0}$ $E_{\text{inf. line}} = \frac{1}{2\pi\epsilon_0}\frac{\lambda}{r}$

$\vec{F}_E = q_0\vec{E}$ $\vec{F}_g = -m\vec{g}$

$$\Phi_E \equiv \oint \vec{E}\cdot d\vec{A} = \frac{Q_{\text{encl}}}{\epsilon_0}$$

$K = \frac{1}{2}mv^2$ $U_e = \frac{1}{4\pi\epsilon_0}\frac{q_1 q_2}{r}$ $\Delta K + \Delta U = W_{ext}$