Constants

Magnitude of electron charge	$e = 1.60 \times 10^{-19}\,\mathrm{C}$
Coulomb's constant	$k = 8.99 \times 10^{9}\,\mathrm{N.m^2C^{-2}}$
Permittivity of free space	$\epsilon_0 = \dfrac{1}{4\pi k}$
	$\epsilon_0 = 8.85 \times 10^{-12}\,\mathrm{C^2N^{-1}m^{-2}}$

Mathematics

Quadratic $ax^2 + bx + c = 0$	$x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Adding vectors $\vec{C} = \vec{A} + \vec{B}$	$C_x = A_x + B_x$
	$C_y = A_y + B_y$
Vector components	$\vec{A} = A_x\hat{i} + A_y\hat{j} + A_z\hat{k}$
θ counterclockwise from x-axis	$A_x = A\cos\theta,\ A_y = A\sin\theta$
Scaler(Dot) product	$\vec{A} \cdot \vec{B} = AB\cos\theta$
Vector(Cross) product	$\lvert\vec{A} \times \vec{B}\rvert = AB\sin\theta$
	$\vec{A} \times \vec{B} = -\vec{B} \times \vec{A}$
Area sphere	$4\pi r^2$
Volume sphere	$\frac{4}{3}\pi r^3$

Equations from 121

Constant acceleration (x dir.)	$\Delta x = v_{x,i}\Delta t + \frac{1}{2}a_x\Delta t^2$
	$v_{x,f} = v_{x,i} + a_x\Delta t$
Kinetic energy	$K = \frac{1}{2}mv^2$
Equation of motion	$\vec{a} = \dfrac{\sum \vec{F}}{m}$

Chapter 22

Coulomb's Law	$\vec{F}^E_{12} = k\dfrac{q_1 q_2}{r^2_{12}}\hat{r}_{12}$
Directional unit vector	$\hat{r}_{12} = \dfrac{\vec{r}_2 - \vec{r}_1}{r_{12}}$

Chapter 23

Dipole moment (electric)	$\vec{p} \equiv q_p\vec{r}_p$
Electric field	$\vec{E} \equiv \dfrac{\vec{F}^E_t}{q_t}$
Induced dipole moment	$\vec{p}_{\mathsf{ind}} = \alpha\vec{E}$
Superposition of electric fields	$\vec{E} = \vec{E}_1 + \vec{E}_2 + \cdots$
Uniform linear charge density	$\lambda \equiv \dfrac{q}{\ell}$
Uniform surface charge density	$\sigma \equiv \dfrac{q}{a}$
Uniform volume charge density	$\rho \equiv \dfrac{q}{V}$

Electric field due to:

A point charge	$\vec{E}_s = k\dfrac{q_s}{r^2_{sP}}\hat{r}_{sP}$
Dipole (aligned with y-axis, far from dipole)	$E_y \approx \begin{cases} \frac{2kp}{\lvert y^3\rvert}, & \text{if on y-axis} \\ \frac{-kp}{\lvert x^3\rvert}, & \text{if on x-axis} \end{cases}$
An infinite line of charge	$E_x = \dfrac{2k\lambda}{x}$
A charged ring (on the axis)	$E_z = k\dfrac{qz}{(z^2 + R^2)^{3/2}}$
A charged disk (on the axis)	$E_z = 2k\pi\sigma z\left[\dfrac{1}{\lvert z\rvert} - \dfrac{1}{(z^2 + R^2)^{1/2}}\right]$
An infinite plane	$E_z = 2k\pi\sigma$
A thin spherical shell	$E = \begin{cases} k\frac{q}{r^2}, & \text{if } r > R \\ 0, & \text{if } r < R \end{cases}$

Chapter 24

Electric flux	$\Phi_E = \displaystyle\int \vec{E} \cdot \mathrm{d}\vec{A}$
Gauss's law	$\Phi_E = \displaystyle\oint \vec{E} \cdot \mathrm{d}\vec{A} = \dfrac{q_{\mathsf{enc}}}{\epsilon_0}$

Chapter 25

Electric potential energy	$U^E = \dfrac{q_1 q_2}{4\pi\epsilon_0}\dfrac{1}{r_{12}}$
Electrostatic work	$W_q(A \to B) = q\displaystyle\int_A^B \vec{E} \cdot \mathrm{d}\vec{\ell}$
Potential (zero at infinity)	$V_p = \dfrac{1}{4\pi\epsilon_0}\displaystyle\sum \dfrac{q_n}{r_{n\mathsf{P}}}$
Electric field (from potential)	$\vec{E} = -\dfrac{\partial V}{\partial x}\hat{i} - \dfrac{\partial V}{\partial y}\hat{j} - \dfrac{\partial V}{\partial z}\hat{k}$
Potential difference	$V_{AB} \equiv \dfrac{-W_q(A \to B)}{q}$
Potential difference closed path	$\displaystyle\oint \vec{E} \cdot \mathrm{d}\vec{\ell} = 0$