Formulas:

$F = k\frac{Q_1Q_2}{r^2}$ Coulomb's law ; $k = \frac{1}{4\pi\varepsilon_0} = 8.99\times10^9 \mathrm{N\cdot m^2/C^2}$; $\varepsilon_0 = 8.85\times10^{-12} C^2/Nm^2$

Electric field due to charge Q at distance r: $\vec{E} = \frac{Q}{4\pi\varepsilon_0 r^2}\hat{r} = \frac{kQ}{r^2}\hat{r}$

Dipole field (p=Ql), along/perpendicular to dipole axis: $E = \frac{1}{2\pi\varepsilon_0}\frac{p}{x^3}$ / $E = \frac{1}{4\pi\varepsilon_0}\frac{p}{y^3}$

Energy of and torque on dipole in external E-field: $U = -\vec{p}\cdot\vec{E}$, $\vec{\tau} = \vec{p}\times\vec{E}$

Linear, surface, volume charge density: $dq = \lambda\, ds$, $dq = \sigma\, dA$, $dq = \rho\, dV$

Electric field of infinite: line of charge: $E = \frac{\lambda}{2\pi\varepsilon_0 r}$; sheet of charge: $E = \frac{\sigma}{2\varepsilon_0}$

Electric field of ring: $E = \frac{1}{2\pi\varepsilon_0 r}\frac{\mathrm{Qx}}{(\mathrm{x}^2 + a^2)^{3/2}}$; disk: $E = \frac{\sigma}{2\varepsilon_0}[1 - \frac{z}{(z^2 + R^2)^{1/2}}]$