Coloumb's Law

$$\vec{F} = \frac{1}{4\pi\epsilon}\frac{q_1 q_2}{R^2}\hat{R}_{12}$$

$$\vec{R}_{12} = \vec{R}_2 - \vec{R}_1$$

Cylindrical Coordinates

$$\langle r, \theta, z \rangle$$

$$r = \sqrt{x^2 + y^2}$$

$$\theta = \arctan(\frac{y}{x})$$

Spherical Coordinates

$$\langle r, \phi, \theta \rangle$$

Electric Field

- Is a vector field defines the electrostatic force F that is exerted on a positive charge q.
- Units of $\mathrm{V/m}$ or $\mathrm{N/C}$

$$\vec{E} = \frac{\vec{F}}{q}$$

$$\vec{E} = \frac{1}{4\pi\epsilon}\frac{q}{R^2}\hat{R}$$

- Direction is determined by where a positive test charge will go