

## Electric Charge

q = electric charge, that which creates electric force of attraction or repulsion

Unit = 1 coulomb or 1 C

$$|\vec{F}_{\text{electric}}| = \frac{k|q_1||q_2|}{r^2}$$

$\vec{F}_{\text{electric}}$  is conservative

## Electric Fields

Units: N/C

$$\vec{E} = \frac{kq}{r^2} = \frac{F}{q}$$

Uniform  $\vec{E}$  fields:

- All lines parallel
- $|\vec{E}|$  is same everywhere

## Line Charge

$\lambda$  = linear charge density  $\lambda = \frac{q}{L} = \frac{dq}{dL}$

Horizontal Line Charge:

$$E_x = 0$$
$$E_y = \frac{k\lambda L}{y\sqrt{\frac{L^2}{4} + y^2}} = \frac{kq}{y\sqrt{\frac{L^2}{4} + y^2}}$$