

---

# Added Notes

---

August 31, 2005

# Definitions

- Electric Field = Force per unit charge.
- Types of charge distributions
  - Point Charges
  - Lines of Charge
  - Areas of Charge
  - Volumes of Charge
- General:

$$\mathbf{E} = k \sum_{\text{all charges } j} \frac{q_j}{r^2} \mathbf{r}_{\text{unit}}$$

# Point Charges

In the Figure, the four particles are fixed in place and have charges  $q_1 = q_2 = +5e$ ,  $q_3 = +3e$ , and  $q_4 = -12e$ . Distance  $d = 9.0$  mm. What is the magnitude of the net electric field at point  $P$  due to the particles?

