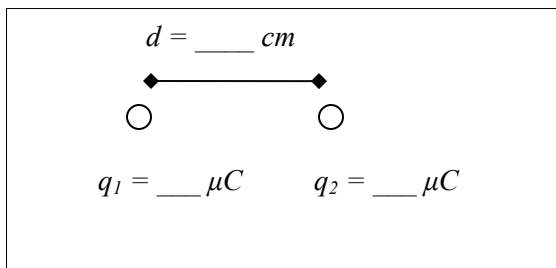


Coulomb Force Vector Addition Practice

Name/Date: _____

Consider the following geometries of charges. Find the net force and direction acting on the specified charge for the given variables.



What is F if $q_1 = q_2 = +30 \mu\text{C}$ and $d = 20 \text{ cm}$?

What is F if $q_1 = q_2 = -30 \mu\text{C}$ and $d = 20 \text{ cm}$?

What is F if $q_1 = 20 \mu\text{C}$ and $q_2 = -30 \mu\text{C}$ and $d = 20 \text{ cm}$?

What is d if $q_1 = 20 \mu\text{C}$ and $q_2 = -30 \mu\text{C}$ and $F = 0.048 \text{ N}$?

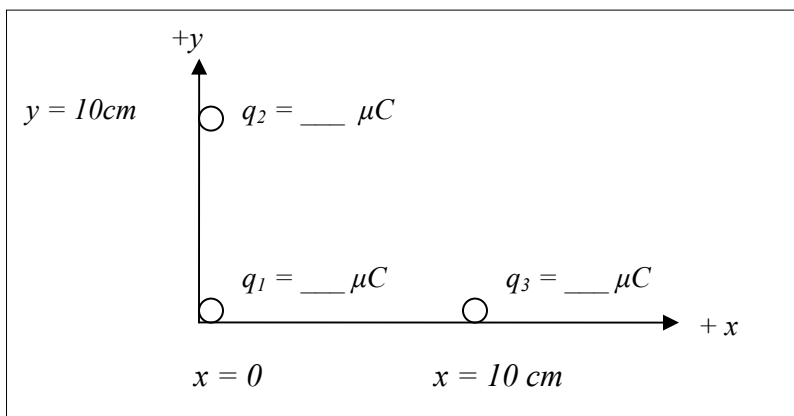


Calculate what would be the net force and direction on q_2 due to q_1 and q_3 if:

- $q_1 = 20 \mu\text{C}$, $q_2 = 20 \mu\text{C}$, $q_3 = 20 \mu\text{C}$
- $q_1 = 20 \mu\text{C}$, $q_2 = -10 \mu\text{C}$, $q_3 = -30 \mu\text{C}$
- $q_1 = -40 \mu\text{C}$, $q_2 = 30 \mu\text{C}$, $q_3 = -60 \mu\text{C}$

Calculate what would be the net force and direction on q_3 due to q_1 and q_2 if:

- $q_1 = 20 \mu\text{C}$, $q_2 = 20 \mu\text{C}$, $q_3 = 20 \mu\text{C}$
- $q_1 = 20 \mu\text{C}$, $q_2 = -10 \mu\text{C}$, $q_3 = -30 \mu\text{C}$
- $q_1 = -40 \mu\text{C}$, $q_2 = 30 \mu\text{C}$, $q_3 = -60 \mu\text{C}$



Calculate the net force and direction on q_1 if:

- $q_1 = 20 \mu\text{C}$, $q_2 = 20 \mu\text{C}$, $q_3 = 20 \mu\text{C}$
- $q_1 = 20 \mu\text{C}$, $q_2 = -10 \mu\text{C}$, $q_3 = -30 \mu\text{C}$
- $q_1 = -40 \mu\text{C}$, $q_2 = 30 \mu\text{C}$, $q_3 = -60 \mu\text{C}$

Calculate the net force and direction on q_3 if:

- $q_1 = 20 \mu\text{C}$, $q_2 = 20 \mu\text{C}$, $q_3 = 20 \mu\text{C}$
- $q_1 = 20 \mu\text{C}$, $q_2 = -10 \mu\text{C}$, $q_3 = -30 \mu\text{C}$
- $q_1 = -40 \mu\text{C}$, $q_2 = 30 \mu\text{C}$, $q_3 = -60 \mu\text{C}$

Coulomb Force Toolbox:

$$F = k \frac{|q_1||q_2|}{d^2}$$

$$F_{net} = \sqrt{F_x^2 + F_y^2}$$

$$\mu = 10^{-6}$$

$$k = 9.0 \times 10^9 \text{ N} \cdot \text{m}^2 / \text{C}^2$$

$$\theta = \tan^{-1} \frac{F_y}{F_x}$$

Double check your calculator? Are you in degree mode?