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$$\vec{F}_p = k q_p \sum_{\substack{i=1 \\ i \neq p}}^n \frac{q_i}{r_{ip}^2} \hat{r}_{ip}$$

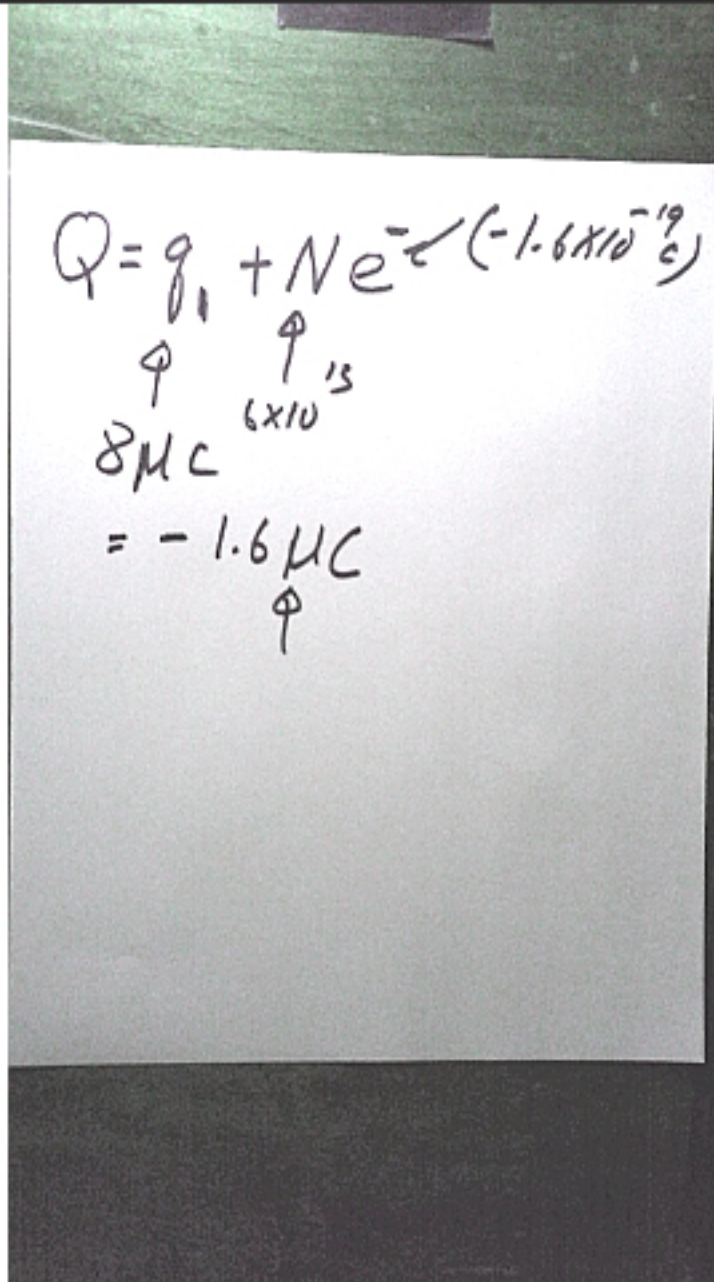
$$\hat{r}_{ip} = \frac{\vec{r}_{ip}}{|\vec{r}_{ip}|}$$

$$\vec{F}_p = k q_p \sum_{\substack{i=1 \\ i \neq p}}^n \frac{q_i (\vec{r}_{ip})}{|\vec{r}_{ip}|^3}$$

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Media playback controls including play/pause, stop, next, previous, full screen, playlist, settings, and volume (0%)

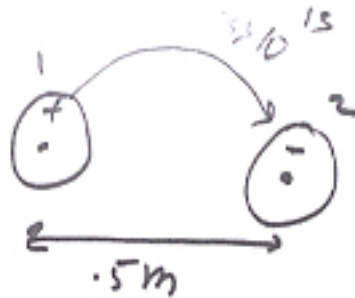


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Media playback controls including a play button, a red stop button, a camera icon, a full screen icon, a list icon, a refresh icon, a close icon, and a volume slider set to 0%.

(2)



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

$$q_1 = (3 \times 10^{-3}) (1.6 \times 10^{-19})$$

$$q_2 = (3 \times 10^{-3}) (-1.6 \times 10^{-19})$$

$$|\vec{F}| = 899 \times 10^9 \frac{(4.8 \mu\text{C})^2}{(.5)^2}$$

$$|F| = .8\text{ N}$$

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(3)  $q_2 < 0$  (neg)

$\vec{F}$

$|\vec{F}| = k \frac{q_1 q_2}{r_{12}^2}$

$3.4\text{N}$        $q_2$        $3.5\mu\text{C}$

$(.26)$        $k = 8990$

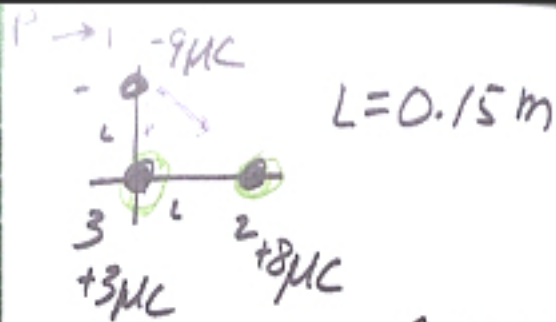
$$q_2 = \frac{F \cdot r_{12}^2}{k q_1}$$

$$q_2 = \frac{(3.4\text{N})(.26)^2}{(8990)(3.5)} = 7.3\mu\text{C}$$

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Media playback controls including play/pause, stop, next, previous, full screen, and volume (0%)



$$\vec{F}_p = \sum_{\substack{i=1 \\ i \neq p}}^n k \frac{q_i q_p \hat{r}_{ip}}{r_{ip}^2}$$

$$= k q_p \sum_{\substack{i=1 \\ i \neq p}}^n \frac{q_i \hat{r}_{ip}}{r_{ip}^2}$$

$$\hat{r}_{ip} = \frac{\vec{r}_{ip}}{|\vec{r}_{ip}|}$$

$$\vec{F}_p = k q_p \sum_{\substack{i=1 \\ i \neq p}}^n \frac{q_i (\vec{r}_{ip})}{r_{ip}^3}$$

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Media playback controls including play/pause, stop, next, previous, full screen, and volume (0%) buttons.

$\vec{r}_p$  (i)  $\vec{r}_1 = 0\hat{x} + L\hat{y}$   
 $\vec{r}_2$   $\vec{r}_2 = L\hat{x} + 0\hat{y}$   
 $\vec{r}_3$   $\vec{r}_3 = 0\hat{x} + 0\hat{y}$   
 $\vec{r}_{i1}$   $\vec{r}_{21} = \vec{r}_1 - \vec{r}_2$   
 $\vec{r}_{31} = \vec{r}_1 - \vec{r}_3$

$$\vec{r}_{21} = (0\hat{x} + L\hat{y}) - (L\hat{x} + 0\hat{y})$$

$$= -L\hat{x} + L\hat{y} \quad L = 0.15 \text{ m}$$

$$\vec{r}_{31} = (0\hat{x} + L\hat{y}) - (0\hat{x} + 0\hat{y})$$

$$= 0\hat{x} + L\hat{y}$$

$$F = k(-9\mu) \left[ (8\mu) \frac{-0.15\hat{x} + 0.15\hat{y}}{(0.15^2 + 0.15^2)^{3/2}} + (3\mu) \frac{0\hat{x} + 0.15\hat{y}}{(0^2 + 0.15^2)^{3/2}} \right]$$

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Video player controls including play/pause, stop, next, full screen, and volume (0%)