

	Physics 250: Unquiz 01	
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Consider the following charge distribution: 1:($+5\mu$;1,0), 2:($+2\mu$;1,1).
Find the vector electrostatic force on charge 1 with correct SI units.

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

$$\vec{r}_1 = 1\hat{x} + 0\hat{y} : \vec{r}_2 = 1\hat{x} + 1\hat{y} : \vec{r}_{ip} = \vec{r}_p - \vec{r}_i = \vec{r}_1 - \vec{r}_2$$

$$\vec{r}_{21} = (1\hat{x} + 0\hat{y}) - (1\hat{x} + 1\hat{y}) = 0\hat{x} - 1\hat{y}$$

$$r_{21}^2 = 1 : \hat{r}_{21} = \frac{0\hat{x} - 1\hat{y}}{1} = 0\hat{x} - 1\hat{y}$$

$$\vec{F}_1 = k_{\mu\mu} \times \frac{2 \times 5}{1} (0\hat{x} - 1\hat{y})$$

$$\vec{F}_1 = 8.99 \times 10^9 \times 1 \times 10^{-12} \times 10^1 (0\hat{x} - 1\hat{y}) = 8.99 \times 10^{-2} \text{ N}$$