Prof. Ranjith P.
Lec. No. 15
Date: 26/9/11

$\vec{A}$

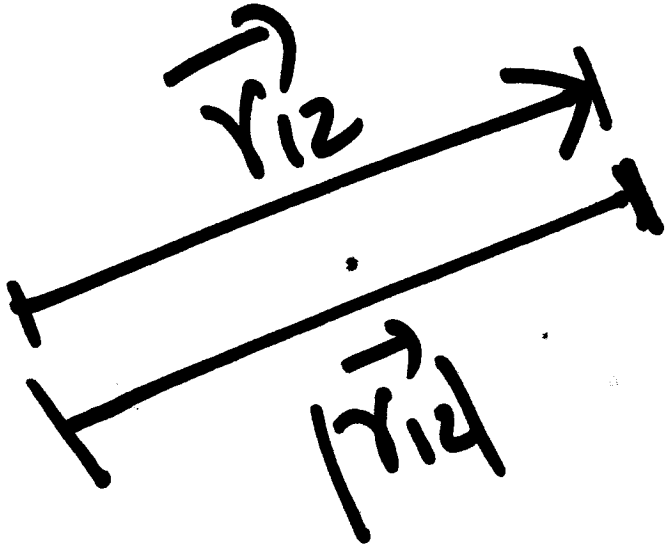
$|\vec{A}|$ = magnitude of A

$\vec{r}$

$|\vec{r}|$ = magnitude of $\vec{r}$

2

$|\vec{r}_{12}|$ = distance of the vector



$$\vec{A} = 3\hat{x} + 4\hat{y}$$

$$|\vec{A}| = |3\hat{x} + 4\hat{y}|$$

$$= \sqrt{3^2 + 4^2}$$

$$= \sqrt{9+16} = \sqrt{25}$$

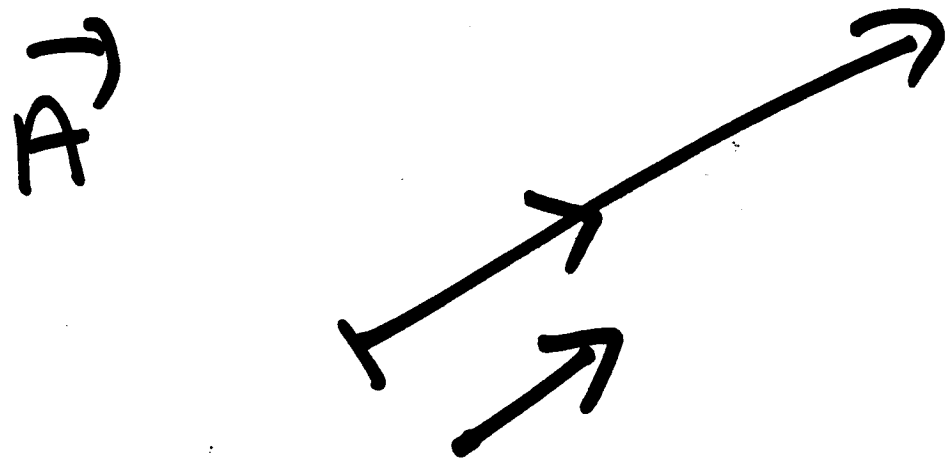
$$= 5$$

$$\vec{v} = v_1 \hat{x} + v_2 \hat{y}$$

$$|\vec{v}| = \sqrt{v_1^2 + v_2^2}$$

magnitude of a vector

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



$$\hat{A} = \frac{\vec{A}}{|A|}$$

$$|\hat{A}| = 1$$

$$\vec{A} = a_1\hat{x} + a_2\hat{y}$$

$$= 3\hat{x} + 4\hat{y} \qquad |\hat{A}| = 1$$

$$\hat{A} = \frac{\vec{A}}{|A|}$$

$$|A| = \sqrt{3^2 + 4^2} = 5$$

$$\hat{A} = \frac{3\hat{x} + 4\hat{y}}{5} = \frac{3}{5}\hat{x} + \frac{4}{5}\hat{y}$$

$$\hat{A} = \frac{3}{5}\hat{x} + \frac{4}{5}\hat{y}$$

$$|\hat{A}| = \sqrt{\left(\frac{3}{5}\right)^2 + \left(\frac{4}{5}\right)^2}$$

$$= \sqrt{\frac{9}{25} + \frac{16}{25}}$$

$$= \sqrt{\frac{25}{25}} = 1$$

$$\hat{r}_{12} = 0.6\,\hat{x} + 0.8\,\hat{y}$$

$$|\hat{r}_{12}| = \sqrt{0.6^2 + 0.8^2}$$

$$= \sqrt{0.36 + 0.64}$$

$$= \sqrt{1} = 1$$

$$\vec{r}_{23} = 4\hat{x} - 8\hat{y}$$

$$|r_{23}| = \sqrt{4^2 + 8^2} = \sqrt{16 + 64}$$

$$= \sqrt{80}$$

$$\hat{r}_{23} = \frac{\vec{r}_{23}}{|r_{23}|} = \frac{4\hat{x} - 8\hat{y}}{\sqrt{80}}$$

$$f_{21} = -0.6 \frac{q_1 q_2}{100\,k} \hat{x} - \frac{0.8\, q_1 q_2}{100\,k} \hat{y}$$

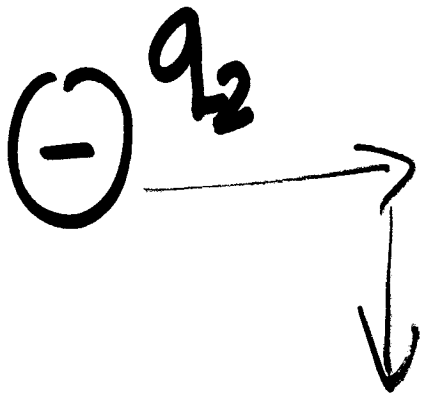
$$f_{23} = \frac{q_1 q_2}{80\,k} \sqrt{\frac{4}{80}}\, \hat{x} - \frac{q_1 q_2}{80\,k} \frac{8}{\sqrt{80}} \hat{y}$$

$$f_{21} + f_{23} = \left(\frac{q_1 q_2}{k} \left(\frac{0.6}{100} + \sqrt{\frac{4}{80}} \frac{1}{80} \right) \right) \hat{x}$$

$$\vec{f_2} = \frac{q_1 q_2}{k}\left[\frac{0.6}{100} + \sqrt{\frac{84}{80}\,\frac{1}{80}}\right]\hat{x} - \frac{q_1 q_2}{k}\left[\frac{0.8}{100} + \sqrt{\frac{8}{80}\,\frac{1}{80}}\right]\hat{y}$$

$$f_2 = (\alpha)\,\hat{x} - (\beta)\,\hat{y}$$

last



$$\vec{F}_2 = \alpha \hat{x} - \beta \hat{y}$$