Attendence → 5 (quiz + assignment + mid + final)

quiz → 10 (best n-1)

assignment → 20 (best n-1)

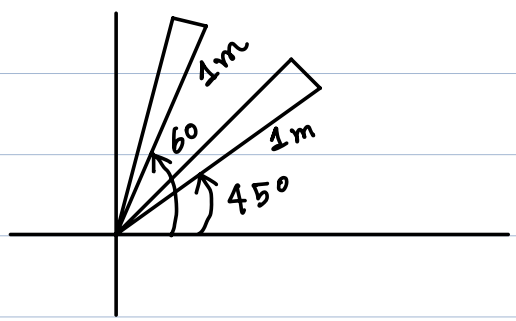
Lab → 10

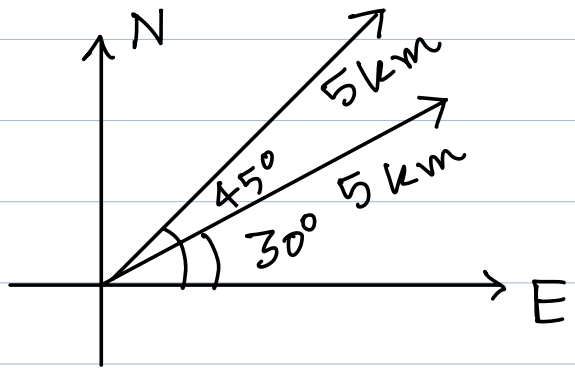
Mid → 20

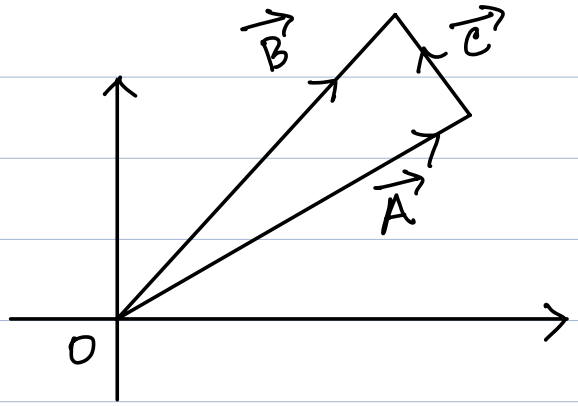
Final → 35

Problem solve - Fundamental of Physics
Resnick Haliday

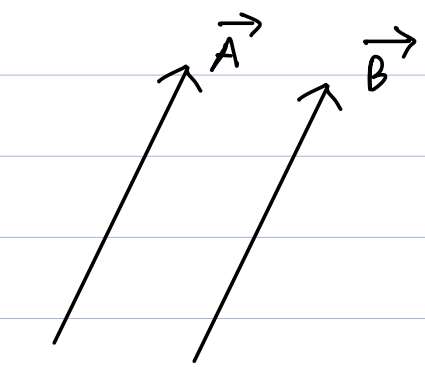
Vector, Scaler

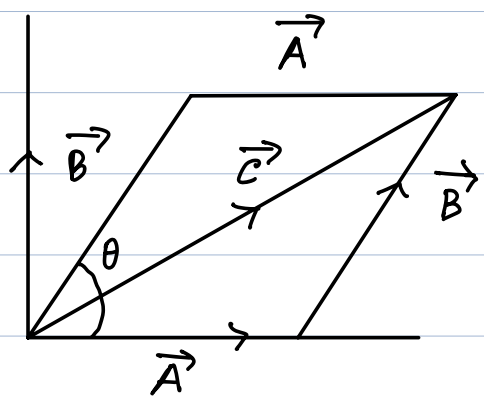






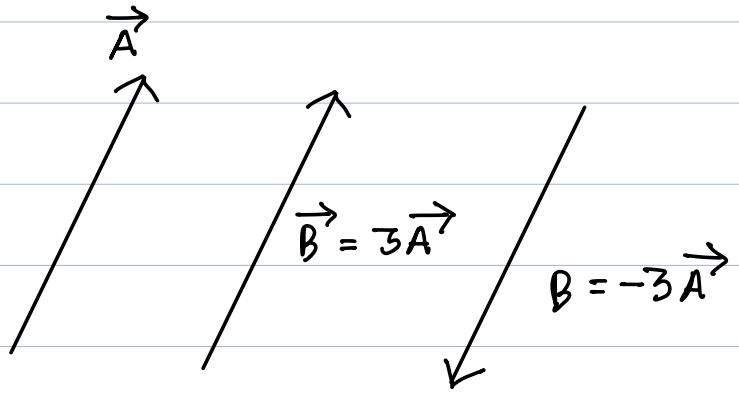
$$\vec{A} + \vec{C} = \vec{B}$$



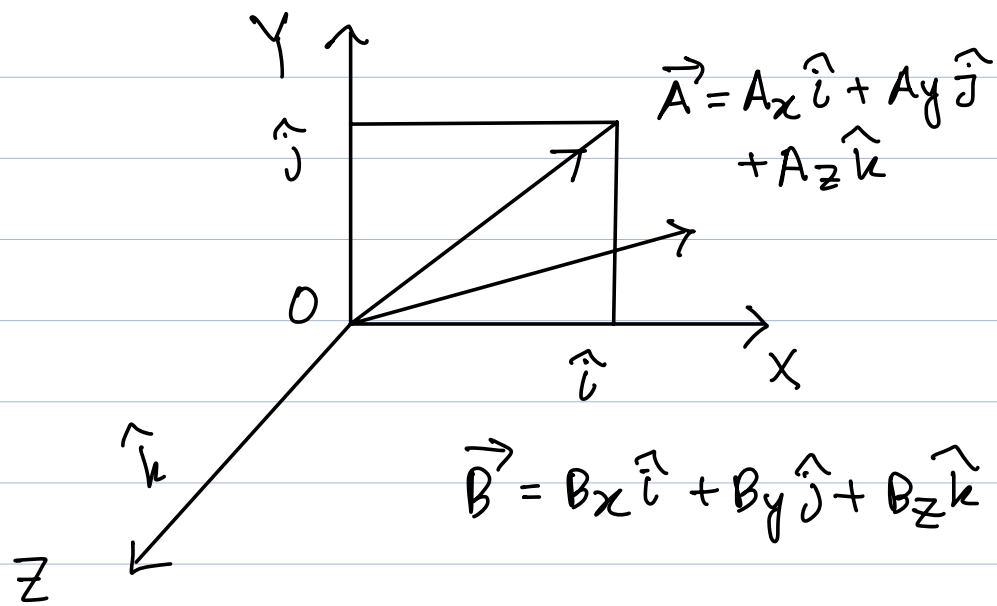


$$\vec{C} = \vec{A} + \vec{B}$$

$$C = \sqrt{A^2 + B^2 + 2AB\cos\theta}$$



$$\vec{A} \cdot \vec{B} = k$$



$$\vec{A}\cdot\vec{B} = A_x B_x(\hat{i}\cdot\hat{i}) + A_y B_y(\hat{j}\cdot\hat{j}) + A_z B_z(\hat{k}\cdot\hat{k})$$

$$\hat{i}\cdot\hat{j} = \begin{cases} 1 ; i = j \\ 0 ; i \neq j \end{cases}$$

$$\vec{A}\cdot\vec{B} = AB\cos\theta$$

$$\vec{A}\cdot\vec{B} = AB\cos\theta$$

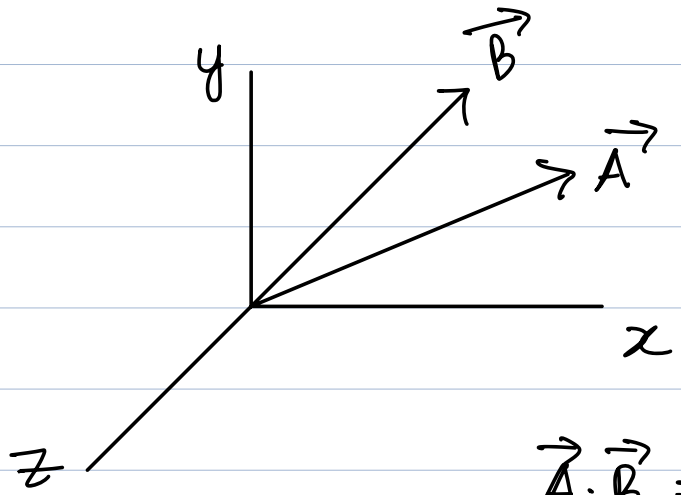
$$\hat{i}\cdot\hat{i} = |\hat{i}|\cdot|\hat{i}|\cos 0^\circ = 1$$

$$\hat{i}\cdot\hat{j} = |\hat{i}|\cdot|\hat{j}|\cos 90^\circ = 0$$

$$\vec{A}\times\vec{B} = \frac{AB\sin\theta}{k}\hat{\eta}$$

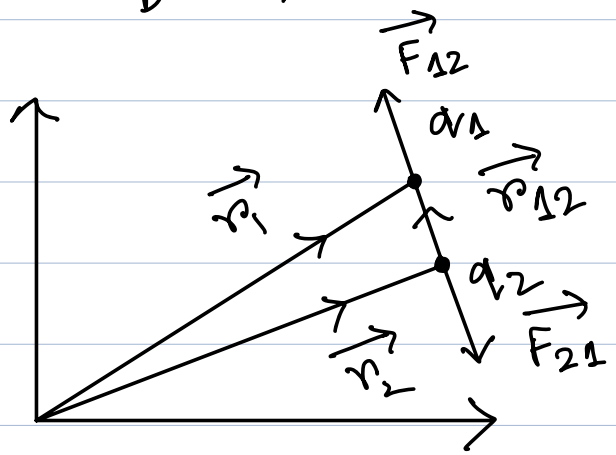
$$\vec{A}\times\vec{B} = \vec{C}$$

$$\vec{B}\times\vec{A} = -\vec{C}$$



$$\vec{A}\cdot\vec{B} = \vec{B}\cdot\vec{A}$$

$$\vec{F_B} = q(\vec{v} \times \vec{B})$$



$$\vec{r_1} = \vec{r_2} + \vec{r_{12}}$$

$$\vec{r_{12}} = \vec{r_1} - \vec{r_2}$$

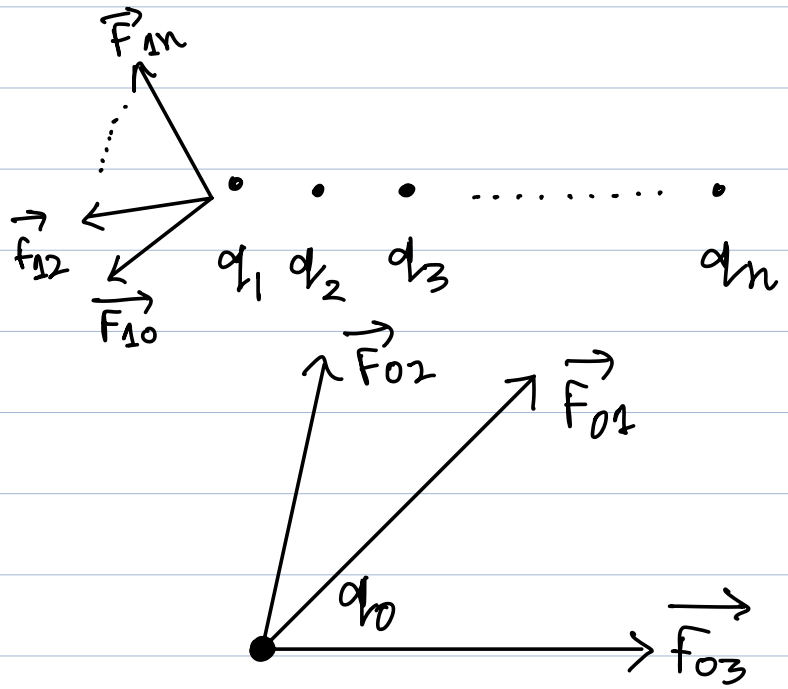
$$\vec{F_{12}} = \frac{1}{4\pi\epsilon_0} \times \frac{q_1 q_2}{(r_{12})^2} \hat{r_{12}}$$

$$\vec{F_{21}} = \frac{1}{4\pi\epsilon_0} \times \frac{q_1 q_2}{(r_{21})^2} \hat{r_{21}}$$

$$\vec{F_{12}} = -\vec{F_{21}}$$

$$\Rightarrow \frac{1}{r_{12}} \hat{r}_{12} = -\frac{1}{r_{21}} \hat{r}_{21}$$

$$\Rightarrow \hat{r}_{12} = -\hat{r}_{21}$$



$$\vec{F_0} = \vec{F_{01}} + \vec{F_{02}} + \vec{F_{03}} + \cdots + \vec{F_{0n}}$$

$$= \sum_{i=1}^{n} \vec{F_{0i}}$$

$$\vec{F_0} = \vec{F_{01}} + \cdots + \vec{F_{0n}}$$

$$\vec{F_1} = \vec{F_{10}} + \cdots + \vec{F_{1n}}$$

$$\vdots$$

$$\vec{F_n} = \vec{F_{n0}} + \cdots + \vec{F_{n(n-1)}}$$

$$\vec{F_{total}} = \vec{F_0} + \vec{F_1} + \cdots + \vec{F_n}$$

$$\vec{F} = \vec{F_{int}} + \vec{F_{ext}}$$

$$\downarrow$$

$$0$$

$$\vec{F_{ext}} = m\vec{a}$$

$$= m\frac{d\vec{v}}{dt}$$

$$0 = m\frac{d\vec{v}}{dt}$$

$$0 = \frac{d\vec{v}}{dt}$$

$$g = \frac{GM}{R^2} \rightarrow \text{distance}$$

$$F = \frac{1}{4\pi\varepsilon_0} \frac{q_1 q_2}{r^2}$$

$$F = G \frac{Mm}{r^2}$$

$$E = \frac{kq}{r^2}$$

$r = 2m$

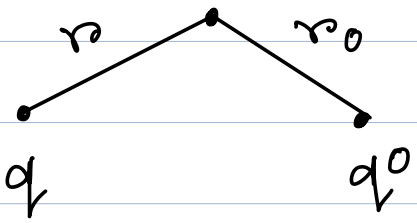
$q = 5$

$$E = \frac{k \cdot 5}{4} = \frac{5k}{4}$$

$r = 4m$

$$E = \frac{5k}{16}$$

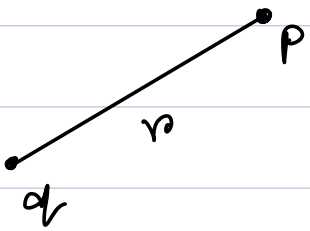
$$\vec{E} = \frac{kq}{r^2} \qquad \vec{E_0} = \frac{kq_0}{r^2}$$



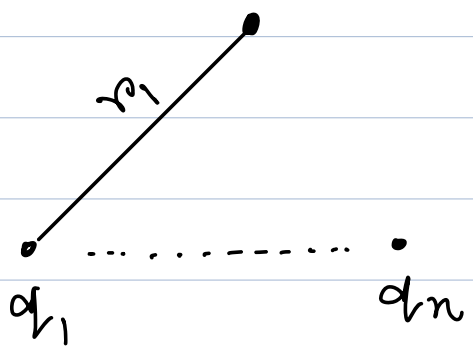
$$\vec{E}_{total} = \vec{E}_0 + \vec{E}$$

$$\vec{F} = q_0 \vec{E}$$

$$\vec{E} = \lim_{q_0 \to 0} \frac{\vec{F}}{q_0}$$



$$\vec{E} = \frac{kq}{r^2} \hat{r}$$



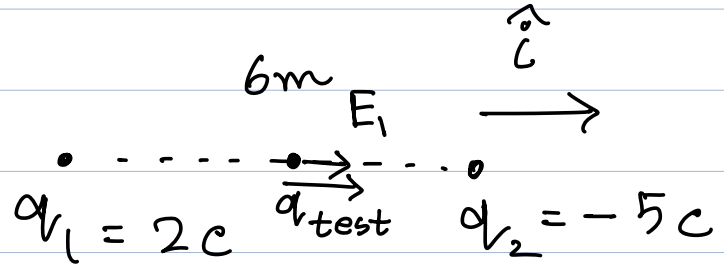
$$\vec{E_1} = \frac{kq_1}{r_1^2}\hat{r}_1$$

$$\vec{E_2} = \frac{kq_2}{r_2^2}\hat{r}_2$$

$$\vdots$$

$$\vec{E_n} = \frac{kq_n}{r_n^2}\hat{r}_n$$

$$\vec{E} = \vec{E_1} + \vec{E_2} + \cdots + \vec{E_n}$$

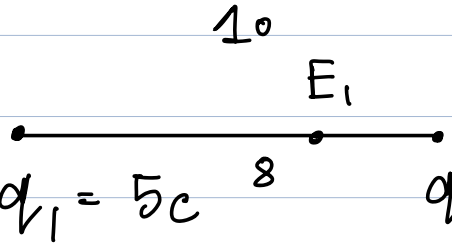


$$\vec{F} = q_{test}\vec{E}$$

$$E_1 = \frac{1}{4\pi\epsilon_0} \frac{|2|}{3^2} \hat{i}$$

$$E_2 = \frac{1}{4\pi\epsilon_0} \frac{|-5|}{3^2} \hat{i}$$

$$E = \frac{1}{4\pi\epsilon_0} \left(\frac{7}{9}\right) \hat{i}$$



$$E_1 = \frac{1}{4\pi\epsilon_0} \times \frac{|5|}{8^2} \hat{i}$$

$$= \frac{1}{4\pi\epsilon_0} \times \frac{5}{64} \hat{i}$$

$$E_2 = \frac{1}{4\pi\epsilon_0} \times \frac{|5|}{2^2} \hat{i}$$

$$= \frac{1}{4\pi\epsilon_0} \times \frac{5}{4} \hat{i}$$

$$E = E_1 - E_2 = \frac{1}{4\pi\epsilon_0} \times \frac{-75}{64} \hat{i}$$