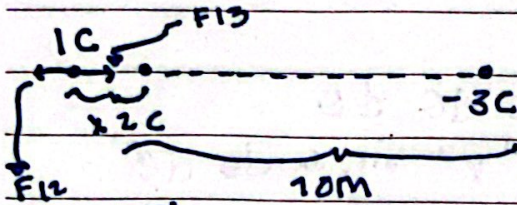


$$\frac{Q}{(r^2 - 2rx + x^2)} = \frac{q}{x^2}$$

$$Qx^2 = q(r^2 - 2rx + x^2)$$



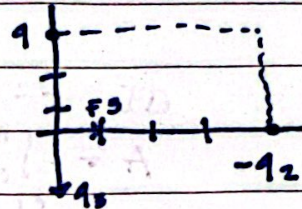
$$\vec{F}_{12} = \vec{F}_{13}$$

$$k \frac{1.2}{x^2} = k \frac{1.3}{(r+x)^2}$$

$$\frac{2}{x^2} = \frac{3}{(10+x)^2}$$

$$3x^2 = 2x^2 + 20x + 100$$

$$x^2 - 20x - 100 = 0$$



$$\vec{F}_{32} = k \frac{13.12}{y^2} (\frac{3}{\sqrt{3^2+0^2}} \hat{i} + \frac{0}{\sqrt{3^2+0^2}} \hat{j})$$

$$= k \frac{13.12}{16} \hat{i}$$

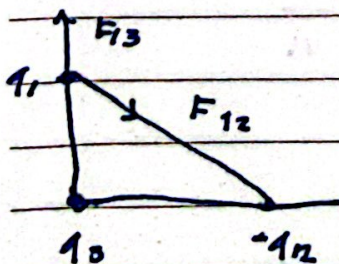
$$\vec{F}_{31} = k \frac{13.1}{3^2} (-\hat{j})$$

$$= -k \frac{13.1}{9} \hat{j}$$

$$\textcircled{1}. |\vec{F}| = \sqrt{k \frac{13.12}{16} \hat{i} + -k \frac{13.1}{9} \hat{j}}$$

$$\vec{F} = k13 \left[\frac{12}{16} \hat{i} - \frac{11}{9} \hat{j} \right]$$

$$\textcircled{2}. |\vec{F}| = k13 \sqrt{\left(\frac{12}{16}\right)^2 + \left(\frac{11}{9}\right)^2}$$

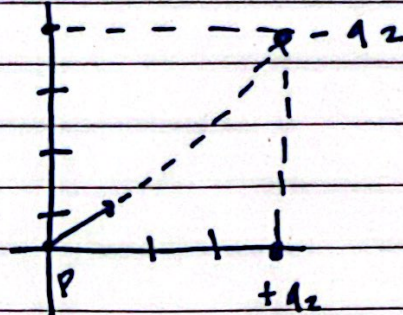
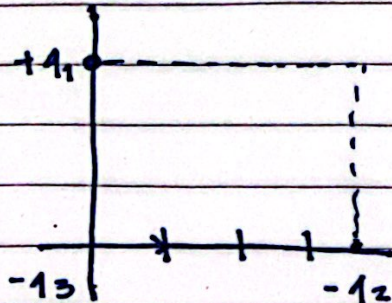


$$\vec{F}_{13} = k \frac{1.1}{3^2}$$

$$\vec{F}_{12} = k \frac{1.1}{5^2} \left(\frac{41-31}{5} \right)$$

$$= 4k \frac{1.1}{125} - 3k \frac{1.1}{125}$$

$$\vec{F} = kq_1 \left[\left(\frac{4q_2}{125} \right) \hat{i} + \left(\frac{13}{1} - \frac{5q_2}{125} \right) \hat{j} \right]$$



$$\vec{E}_3 = \frac{F_{32}}{q_3} = k \frac{q_3 q_2}{r^2}$$

$$F = k \frac{q_2}{r^2} \hat{r}_0$$

$$\vec{E}_1 = k \frac{q_1}{3^2} (-\hat{i})$$

$$= -k \frac{q_1}{9} \hat{i}$$

$$E_2 = k \frac{q_2}{5^2} \left(\frac{3\hat{i} + 4\hat{j}}{5} \right)$$

$$= 3k \frac{q_2}{125} \hat{i} + 4k \frac{q_2}{125} \hat{j}$$

$$= k \left[\left(\frac{3q_2}{125} - \frac{q_1}{9} \right) \hat{i} + \frac{4q_2}{125} \hat{j} \right]$$