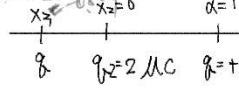


練習 15.6



$$|\vec{F}_3| = |\vec{F}_2| \quad \frac{k_e |q_1| |q_2|}{r_{12}^2} = \frac{k_e |q_2|^2 |q_3|}{r_{23}^2}$$

$$\frac{10}{r_{12}^2} = \frac{2}{r_{23}^2} \quad \because r_{12} > r_{23} \quad \therefore q_3 \text{ 在右邊}$$

$$10d^2 = 2(1+d)^2 \quad \because d = \text{負不合}$$

$$5d^2 = (1+d)^2 \quad \therefore d = 0.809, x_3 = 0.809 \text{ m}$$

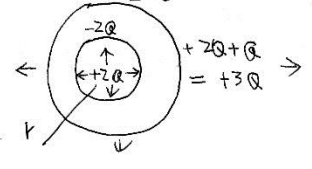
$$0 = -4d + 2ad + 1$$

練習 15.7

$r < a, E = \frac{k_e(2Q)}{r^2}$ 指向外

$a < r < b, E = 0$

$r > b, E = \frac{k_e(+3Q)}{r^2}$ 指向外



練習 15.4

$F_e = |q_0|E$

$E = 2.7 \times 10^5 \text{ N/C}$

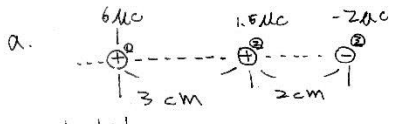
$F_e = F_g$

$F_g = mg \quad |q_0|E = mg$

$q = 9.8 \text{ m/s}^2 \quad m = \frac{|q_0|E}{g} = \frac{1.6 \times 10^{-19} \times 2.7 \times 10^5}{9.8}$

$= 4.41 \times 10^{-15} \text{ (kg)}$

習題 11 (P.520)



$E = \frac{k_e |q|}{r^2}$

$E_1 = \frac{9 \times 10^9 \times 6 \times 10^{-6}}{0.02^2} = 1.35 \times 10^8$

→

$E_2 = \frac{9 \times 10^9 \times 1.5 \times 10^{-6}}{0.01^2} = 1.35 \times 10^8$

←

$E_3 = \frac{9 \times 10^9 \times 2 \times 10^{-6}}{0.03^2} = 2 \times 10^7$

→

$\vec{E} = \vec{E}_1 + \vec{E}_2 + \vec{E}_3$

$= E_1 - E_2 + E_3$

$= 9 \times 10^9 \times \left(\frac{6}{0.02^2} - \frac{1.5}{0.01^2} + \frac{2}{0.03^2} \right) \times 10^{-6}$

$= 9 \times \frac{2}{0.03^2} \times 10^7$

b. $\vec{E} = \frac{\vec{E}}{q_0} \quad \vec{F} = 80 \vec{E}$

$= \frac{-2 \times 10^7}{80} \times 2 \times 10^7$

$= -40 \text{ N} \leftarrow \text{向左}$