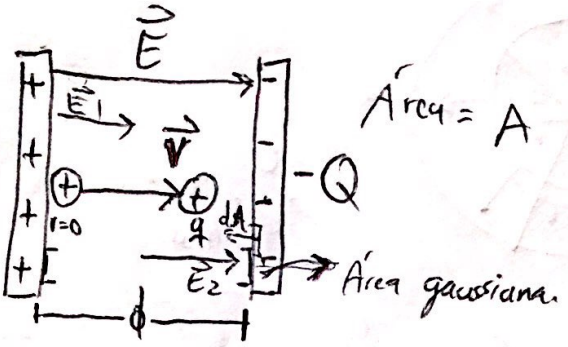
Taller 2

1.



a. $\vec{E} = \vec{E_1} + \vec{E_2}$ $\quad \vec{E_1} = \vec{E_2} \leftarrow \vec{E_1} - \vec{E_2} = 0$

$\vec{E} = 2\vec{E_1}$

$E = 2E_1$ $\quad E_1 = \dfrac{Q_{int}}{2\epsilon_0 \int \epsilon_0 \theta \, dA}$ (1)

$E = \dfrac{2\, Q_{int}}{2\epsilon_0 A}$ $\quad E_1 = \dfrac{Q_{int}}{2\epsilon_0 A}$

$E = \dfrac{Q_{int}}{\epsilon_0 A}$ $\quad E = \dfrac{\sigma}{\epsilon_0}$

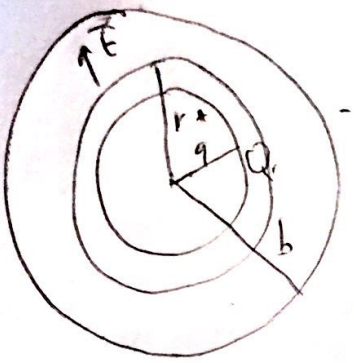
b. $\vec{F} = \vec{E} \cdot q$

$m_q \vec{a} = \vec{E} \cdot q$ $\quad \vec{E} = \dfrac{Q}{\epsilon_0 A}\hat{i}$ $\quad \vec{a} = \dfrac{V_f - V_i}{t_f - t_i}$

$\vec{a} = \dfrac{\vec{E} \cdot q}{m_q}$ $\quad V_f^2 = V_i^2 + 2a \cdot d$

$\vec{a} = \dfrac{Q \cdot q}{m_q \epsilon_0 A}\hat{i}$ $\quad \dfrac{V_f^2 - V_i^2}{2d} = a$

$\dfrac{V_f^2 - V_i^2}{2d} = \dfrac{Q \cdot q}{m_q \epsilon_0 A}\hat{i} \rightarrow \sqrt{\dfrac{2d\, Q \cdot q}{m_q \epsilon_0 A} + V_i^2} = V_f$ $\quad \boxed{V_f = \sqrt{\dfrac{2d\, Q \cdot q}{m_q \epsilon_0 A}}}$



$-Q_2$ $\int \vec{E} \cdot d\vec{A} = \frac{Q_{int}}{\epsilon_0}$

$\int E \cos\theta \, dA = \frac{Q_{int}}{\epsilon_0}$

r varía.

$\int E \cos 0 \, dA = \frac{Q_{int}}{\epsilon_0}$

$E \int dA = \frac{Q_{int}}{\epsilon_0}$

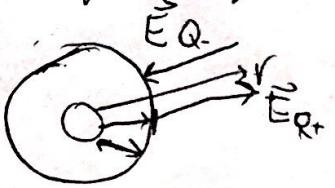
$EA = \frac{Q_{int}}{\epsilon_0}$ $\quad E = \frac{Q_{int}}{\epsilon_0 A}$ $\quad A = 2\pi r L$

$$E = \frac{Q_{int}}{\epsilon_0 2\pi r L} \quad \text{Para } a < r < b$$

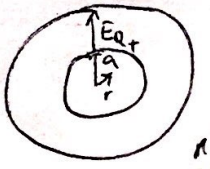
· Si · $r > b$.

$+Q_1 - Q_2 = 0$ → Por lo tanto el cargo.. es igual a 0.

↳ $E = \frac{0}{2\epsilon_0 \pi r L} = 0$

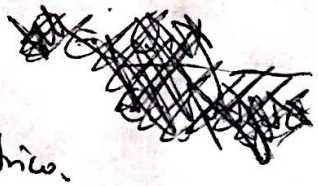


Si $r < a$



$dA = 0$

↳ Por lo tanto no hay cargo eléctrico.



→ La superficie interna no guarda carga por ende. si $r < a$ no hay un cargo eléctrico sobre dicho punto.