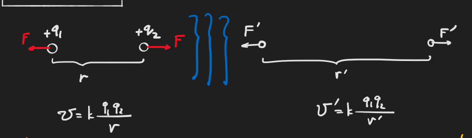
Τρ 23/3/2021

B+2

1ο ΓΕΛ ΣΑΛΑΜΙΝΑΣ

$\boxed{\Delta U = -W}$



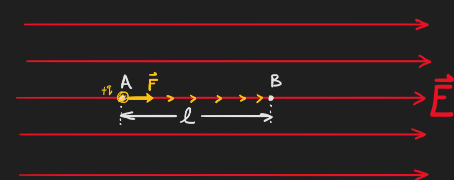
$U = k\frac{q_1 q_2}{r}$ $\qquad$ $U' = k\frac{q_1 q_2}{r'}$

$W_{F(r\to r')} = -\Delta U = -(U'-U) = U - U' = k\frac{q_1 q_2}{r} - k\frac{q_1 q_2}{r'} \Rightarrow$

$\Rightarrow \boxed{W_{F(r\to r')} = k q_1 q_2 (1/r - 1/r')}$ $\left.\begin{matrix} \\ (r'>r \Rightarrow 1/r > 1/r') \end{matrix}\right\}$ $W_F > 0$ (θετικό γιατί $\vec F \uparrow\uparrow \Delta\vec x$)

Επειδή η $F = f(r)$ ($F = k|q_1 q_2|/r^2$) δεν μπορούμε να βρούμε το $W(r\to r')$ με άλλο τρόπο (στο Λύκειο)

Σχέση Έντασης κ' Διαφοράς Δυναμικού στο ΟΜΟΓΕΝΕΣ ΗΛ. ΠΕΔΙΟ



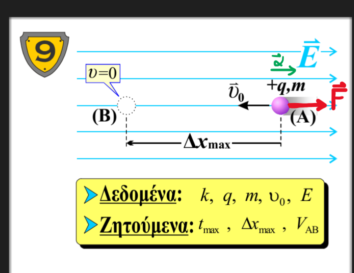
αρχικός ορισμός έντασης $\boxed{\vec E = \vec F/q}$ $[E]_{S.I.} = 1\ N/C$

$\boxed{E = \frac{V}{\ell}}$ $\quad [E]_{S.I.} = 1\ \frac{Volt}{m}$

$(V = V_A - V_B)$ → V: Διαφορά δυναμικού κατά την φορά των δ.γ. $(\vec{AB} \uparrow\uparrow \vec E)$

$q>0 \Rightarrow \vec F \uparrow\uparrow \vec E$ / $E = \text{σταθ.} \Rightarrow F = q\cdot E = \text{σταθ.}$

$\left.\begin{matrix} \vec F \uparrow\uparrow \vec{AB} \rightarrow W_{F(A\to B)} = +F\cdot(AB) \quad (\text{Α'Λ.}) \\ W_{F(A\to B)} = q\cdot V_{AB} \quad (\text{Β'Λ(Γεν.)}) \end{matrix}\right\} \Rightarrow F\cdot(AB) = q\cdot V_{AB} \Rightarrow E\cdot\cancel{q}\cdot(AB) = \cancel{q}\cdot V_{AB} \Rightarrow \boxed{E = \frac{V_{AB}}{(AB)}}$ ή $\boxed{E = \frac{V}{\ell}}$



$\left.\begin{matrix} q>0 \Rightarrow \vec F \uparrow\uparrow \vec E \\ \vec\alpha = \frac{\vec F}{m} \xrightarrow[m>0]{} \vec\alpha \uparrow\uparrow \vec F \end{matrix}\right\} \vec\alpha \uparrow\uparrow \vec E$

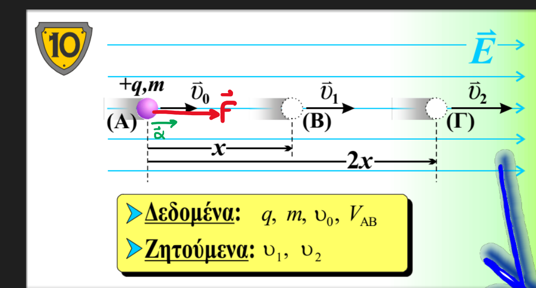
από το σχήμα: $\vec\upsilon_0 \uparrow\downarrow \vec E$

$\vec\alpha \uparrow\downarrow \vec\upsilon_0 \rightarrow \vec\alpha$: επιβραδύνει

$\Downarrow$

$\boxed{\text{ΕΟΕβκ}}$

- $\alpha = \frac{\Sigma F}{m} = \frac{F}{m} = \frac{E\cdot q}{m}$ $\quad \left(E = \frac{F}{|q|}\right)$
- $\upsilon = \upsilon_0 - \alpha t \xrightarrow[\upsilon=0]{max} 0 = \upsilon_0 - \alpha\cdot t_{max} \Rightarrow \alpha\cdot t_{max} = \upsilon_0 \Rightarrow \boxed{t_{max} = \frac{\upsilon_0}{\alpha}} = \frac{\upsilon_0}{\frac{E\cdot q}{m}} \Rightarrow \boxed{t_{max} = \frac{m\cdot\upsilon_0}{E\cdot q}}$
- $\Delta x = \upsilon_0 t - \frac{1}{2}\alpha t^2 \Rightarrow \Delta x_{max} = \upsilon_0\cdot t_{max} - \frac{1}{2}\alpha t_{max}^2 \Rightarrow \Delta x_{max} = \upsilon_0\frac{\upsilon_0}{\alpha} - \frac{1}{2}\cancel{\alpha}\frac{\upsilon_0^2}{\alpha^{\cancel{2}}} = \frac{\upsilon_0^2}{\alpha} - \frac{1}{2}\frac{\upsilon_0^2}{\alpha} \Rightarrow \boxed{\Delta x_{max} = \frac{\upsilon_0^2}{2\alpha}} \Rightarrow \Delta x_{max} = \frac{\upsilon_0^2}{2\frac{E\cdot q}{m}} \Rightarrow \boxed{\Delta x_{max} = \frac{m\cdot\upsilon_0^2}{2 E\cdot q}}$
- $E = \frac{V}{\ell} \rightsquigarrow E = \frac{V_{BA}}{(BA)} \Rightarrow V_{BA} = E\cdot(BA) \Rightarrow V_{AB} = -E\cdot(BA) \xrightarrow{(BA)=\Delta x_{max}} V_{AB} = -\cancel{E}\frac{m\cdot\upsilon_0^2}{2\cdot\cancel{E}\cdot q} \Rightarrow \boxed{V_{AB} = -\frac{m\cdot\upsilon_0^2}{2q}}$



$\left.\begin{matrix} q>0 \Rightarrow \vec F \uparrow\uparrow \vec E \\ \vec\alpha = \frac{\vec F}{m} \xrightarrow[m>0]{} \vec\alpha \uparrow\uparrow \vec F \end{matrix}\right\} \vec\alpha \uparrow\uparrow \vec E$

$\vec\upsilon_0 \uparrow\uparrow \vec E \longrightarrow \vec\alpha \uparrow\uparrow \vec\upsilon_0 \longrightarrow \vec\alpha$: επιταχύνει

$\Downarrow$

$\left.\begin{matrix} \text{ΕΟΕχκ} \\ \underbrace{\text{με } \upsilon_0} \end{matrix}\right\} \alpha = \frac{F}{m} = \frac{E\cdot q}{m} = \text{σταθερό}$

$\upsilon = \upsilon_0 + \alpha t$

$\Delta x = \upsilon_0 t + \frac{1}{2}\alpha t^2$

To be Continued...