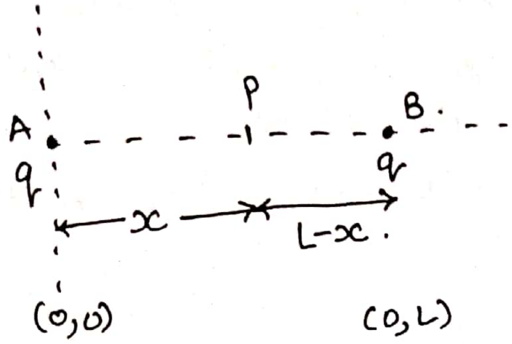
Two identical point charges.....



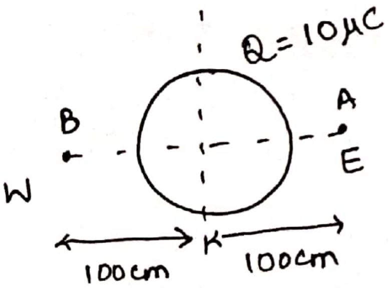
$E_P = E_A - E_B$ (due to opp. direction)

$= Kq\left[\frac{1}{(L-x)^2} - \frac{1}{x^2}\right]$

for A; $x=0$ $E = Kq \cdot \frac{1}{L^2}$

for B; $x=L$ $E = -kq \cdot \frac{1}{L^2}$ option (D).

A metallic sphere has a charge....



Work done = change in pot. energy.

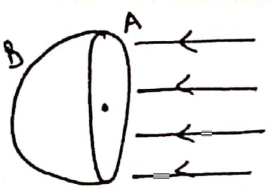
$= U_f - U_i$

$U_f = U_B = \frac{Kq_1q_2}{r} = \frac{KQ}{r}$.

$U_i = U_A = \frac{KQ}{r}$.

$W = 0$.

Find out the flux through....



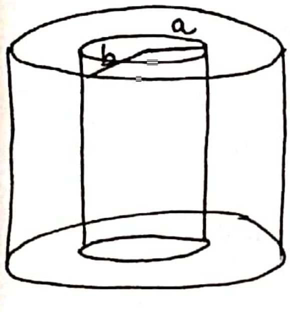
flux entering surface A

= Flux leaving from curved surface B.

$\phi_B = \phi_A = \oint \vec{E} \cdot \vec{ds} = \oint E\,ds \cos 0°$

$= E\oint ds = E(\pi r^2)$

Two large cylinderical shells.....



Because for shells, radius is small as compared to length, they act like wires.

E. field due to long wire

$$= \frac{\lambda}{2\pi\varepsilon_0 r}.$$

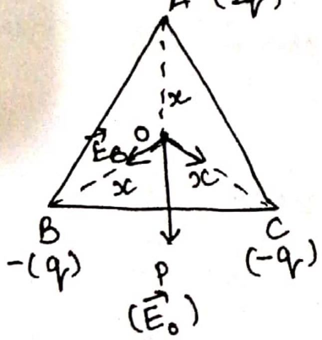
for rotation; $F_e = F_c$

$$qE = \frac{mv^2}{r}.$$

$$\frac{\lambda q}{2\pi\varepsilon_0 r} = \frac{mv^2}{r}.$$

$$v = \sqrt{\frac{\lambda q}{2\pi\varepsilon_0 m}}.$$

Three charges 2q, -q, -q., ...



Electric field at O due to B and C.

$$\vec{E_o} = \vec{E_B} + \vec{E_C} \quad \text{(vector sum)}$$

$$E_o = ~~\frac{KQ}{x^2}~~ = \sqrt{E_B^2 + E_C^2 + 2E_B E_C \cos 120^\circ}$$

$$E_B = E_C$$

$$E_o = \sqrt{E^2 + E^2 + 2E^2\left(-\frac{1}{2}\right)} = E = E_B.$$

and directed along $\vec{OP}$

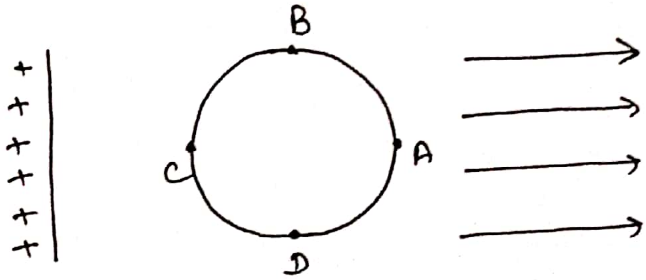
which is ~~opp.~~ along to $\vec{E_A}$. Hence $\vec{E}_{net} \neq 0$.

But potential is a scalar q.tty.

$$V_{net} = V_A + V_B + V_C$$

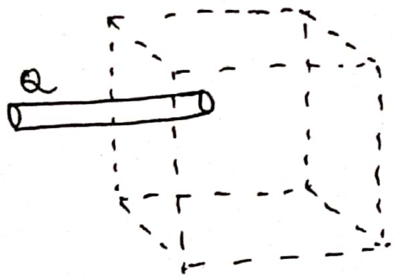
$$= \frac{K2q}{x} - \frac{kq}{x} - \frac{kq}{x} = 0.$$

The electric field in a region ....



A will be the point of min. potential.

A charge is Q is uniformly distributed over...

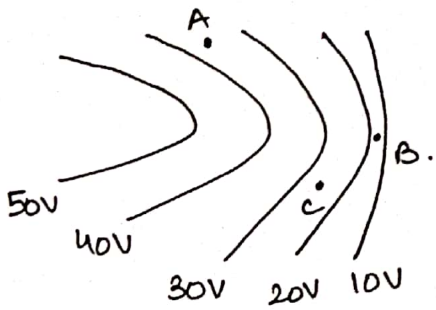


charge of rod enclosed by cylinder or cube $= Q_{enc} = \frac{Q}{2}$

E. Flux $= \Phi_E = \frac{1}{\varepsilon_0}(Q_{enc})$

$= \frac{Q}{2\varepsilon_0}$.

The fig. shows lines of constt. ....



for every two lines $\Delta V = 10\,V$.

$E = \frac{\Delta V}{\Delta r}$. (in magnitude)

E will be max; when Δr is min.

B will have max E.