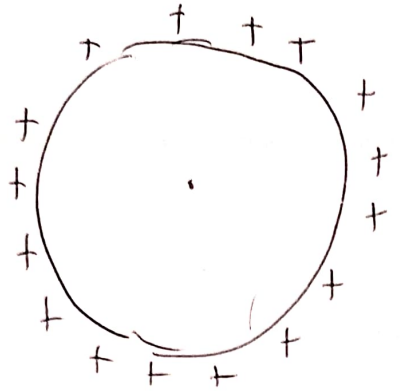
5.-



equilibrio electrostático a carga colocase o mais afastada posible, polo tanto, sobre a superficie da esfera.

$$\oint \vec{E}\, d\vec{s} = \frac{Q_{encerrada}}{\varepsilon}$$

$$E \cdot 4\pi r^2 = \frac{Q_e}{\varepsilon_0} \Rightarrow E = \frac{Q}{4\pi\varepsilon_0 r^2} = \frac{1}{4\pi\varepsilon_0}\frac{Q}{r^2}$$

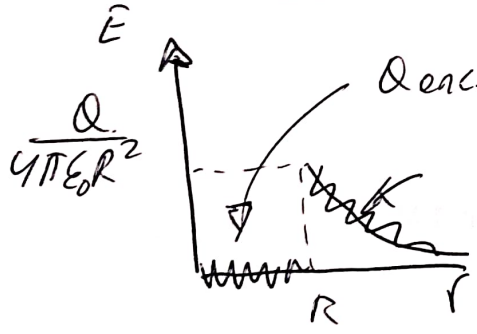
$$E = K\frac{Q}{r^2}\ ;$$

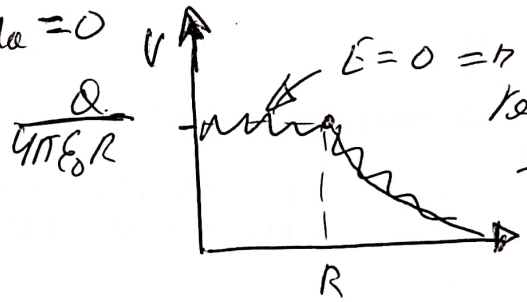
$$\Delta V = \vec{E}\cdot\Delta\vec{r}\ ; \qquad V = K\frac{Q}{r}\ ;\ V = \frac{Q}{4\pi\varepsilon_0 r}$$

para a superficie da esfera $|\vec{E}| = \frac{Q}{4\pi\varepsilon_0 R^2}$ e $V = \frac{Q}{4\pi\varepsilon_0 R}$

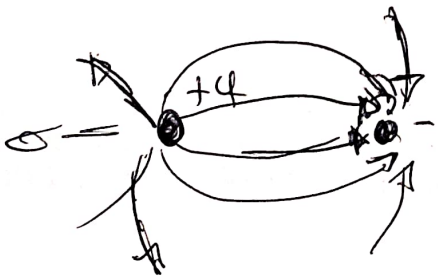
$$\Delta V = \vec{E}\cdot\Delta\vec{r} \Rightarrow \text{si } E = 0 \text{ no interior da esfera}$$

$$\Delta V = 0 \Rightarrow V = \frac{Q}{4\pi\varepsilon_0 R}$$

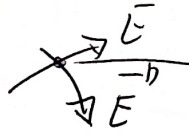




6.-



a) teñen fontes e sumidoiros non son pechadas. FALSA.

c) 

neste punto habería dous valores do campo FALSA

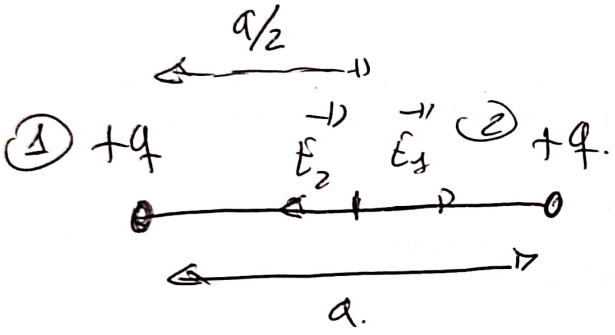
7.-

$$E_p = K \frac{q_1 q_2}{r^2}$$

$r \downarrow \Rightarrow E_p \uparrow$ a)

8.-

$$\oint \vec{E} \cdot d\vec{S} = \frac{Q_{encerrado}}{\varepsilon}$$ b)



$|\vec{E}_2| = |\vec{E}_1|$ en $a/2$ $\quad \vec{E}_{TOTAL} = 0$

$$V = V_1 + V_2 = K \frac{q}{q/2} + K \frac{q}{\frac{a}{2}} = 4K \frac{q}{a}$$

b)

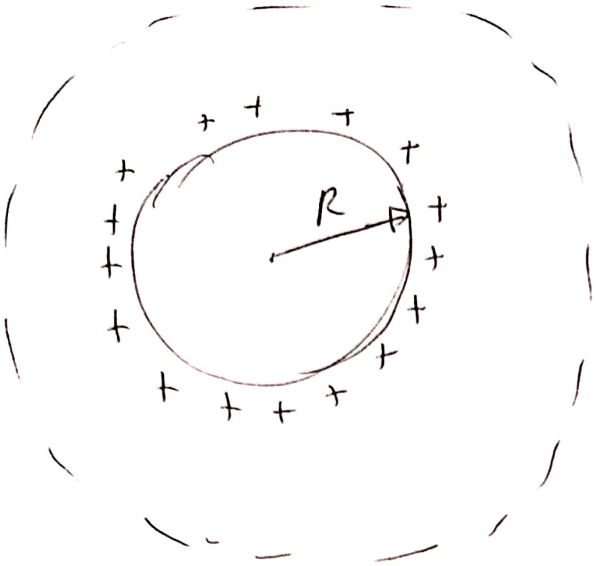
10.-

Superficie equipotencial $V = cte \Rightarrow V_1 = V_2$

$$W = -\Delta E_p = -q \underbrace{(V_2 - V_1)}_{=0} \Rightarrow W = 0$$

a)

11.-

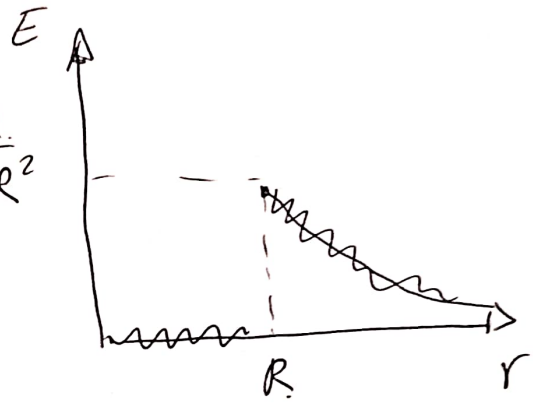


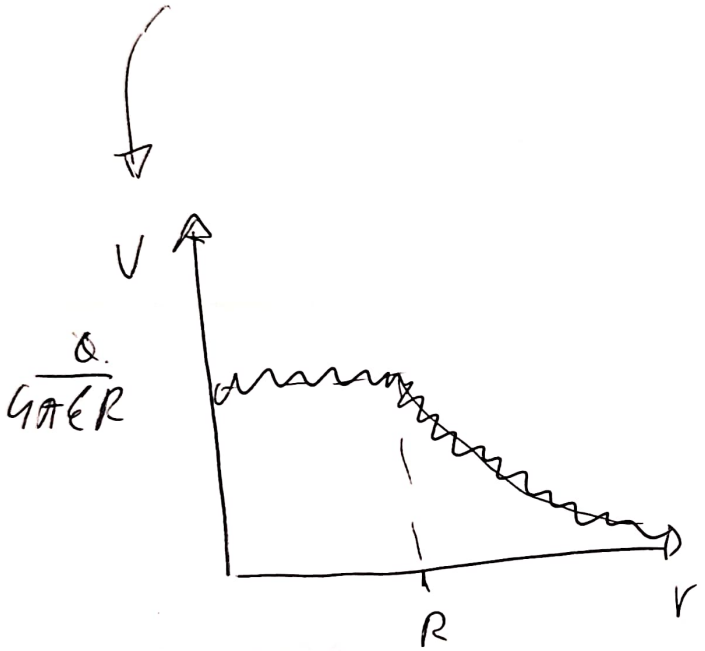
$$\oint \vec{E} \cdot d\vec{S} = \frac{Q_{en.}}{\varepsilon}$$

$$E 4\pi r^2 = \frac{Q}{\varepsilon}$$

$$|\vec{E}| = \frac{Q}{4\pi\varepsilon r^2}$$

$$\Delta V = \vec{E}\,\Delta\vec{S}$$





12.-

Razoamento igual que o anterior

a)

13.-

$V_\infty = 0$

$V_p = 0$

$$W_\infty^p = -q'(V_p - V_\infty)$$

$$\Downarrow$$

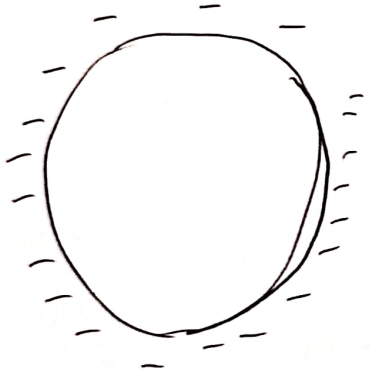
$$0$$

$$W_\infty^p = 0$$

c)

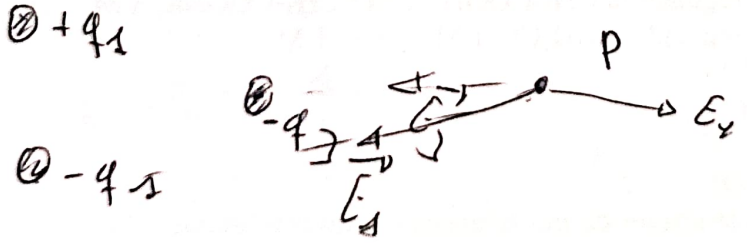
14.-

a)



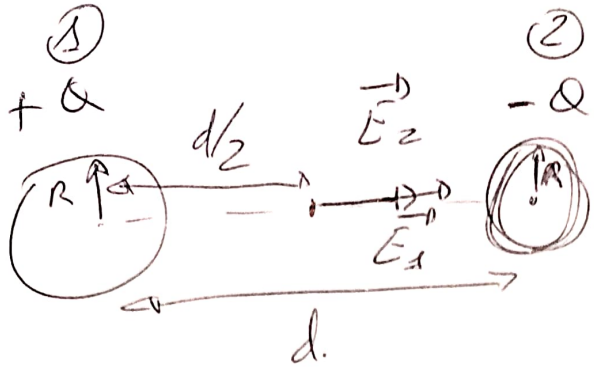
a carga distribúese por todo o conductor, xa que tende estar o máis lonxe posible. Ten o mesmo signo e repélese

15.-



a)

16.-



$d/2 \gg R$ implica cargas puntuales

en $d/2$ potencial cero.

Nº punto medio

$$V_1 = K\frac{Q.}{d/2} \; ; \; V_2 = -K\frac{Q.}{d/2} \Rightarrow V_{TOTAL} = 0$$

$$\vec{E}_1 = K\frac{Q.}{(d/2)^2}\vec{i} \; ; \; \vec{E}_2 = -K\frac{Q.}{(d/2)^2}\vec{i}$$

$$|\vec{E}|_{TOTAL} = 8K\frac{Q.}{d^2}$$

b)

17.-

$$M_1 = m_2 = 1\,Kg$$

$$q_1 = q_2 = 1\,C.$$

$$F_G = 6'67\cdot10^{-11}\frac{N.m^2}{Kg^2}\frac{1Kg.1Kg}{(1m)^2} = 6'67\cdot10^{-11}N$$

$$F_E = 9.10^9\frac{N.m^2}{C^2}\frac{1C.1C}{(1m)^2} = 9.10^9N$$

a) Falsa

b) Falsa

c) Son os dous conservativos

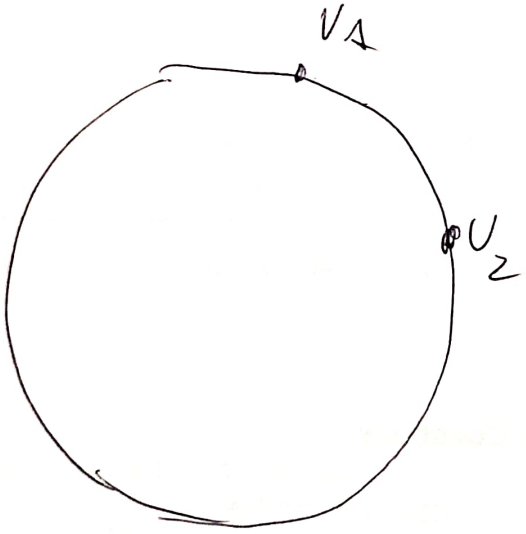
O traballo non depende da traxectoria seguida $\Rightarrow W = -\Delta E_p$

18.-

A carga repártese entre as dous esferas e o potencial igualase (igualase).

A resposta é a b)

19.-

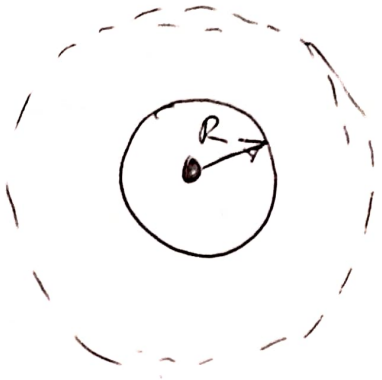


$V_1 = V_2$

Teñen o mesmo potencial.

c)

20.-



$$\oint \vec{E} \cdot d\vec{s} = \frac{Q}{\varepsilon_0}$$

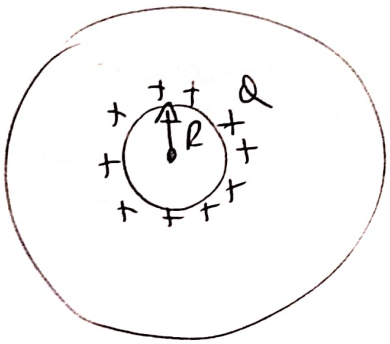
$$\Phi = \oint \vec{E} \cdot d\vec{s}$$

Φ ↑

flujo

b) $\dfrac{Q}{4\pi\varepsilon_0 r^2}$

21.-



$$\oint \vec{E} \cdot d\vec{s} = \frac{Q_e}{\varepsilon}$$

$$E \cdot 4\pi r^2 = \frac{Q}{\varepsilon}$$

$$E = \frac{Q}{4\pi\varepsilon r^2} \Rightarrow E = \frac{1}{4\pi\varepsilon} \cdot \frac{Q}{r^2}$$

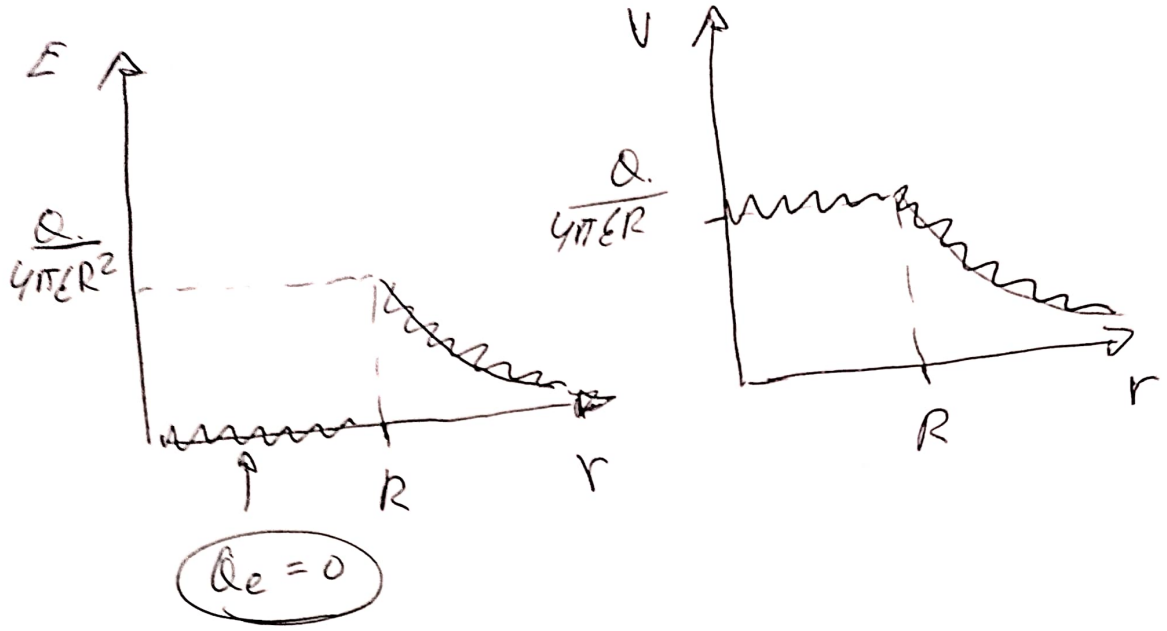
$$E = k \frac{Q}{r^2}$$

$$\Delta V = \vec{E}\,\Delta\vec{r} \qquad V = \frac{Q}{4\pi\varepsilon r}$$

Si $E = 0 \Rightarrow \Delta V = 0$

$V = \dfrac{Q}{4\pi\varepsilon R}$ para $r < R$ $V = \underline{\underline{\dfrac{Q}{4\pi\varepsilon R}}}$

para que $\Delta V = 0$



c)

22.-

a)

a c) e pelsa a carga tende a estar o máis lonxe posible, repelese.

23.-

c)