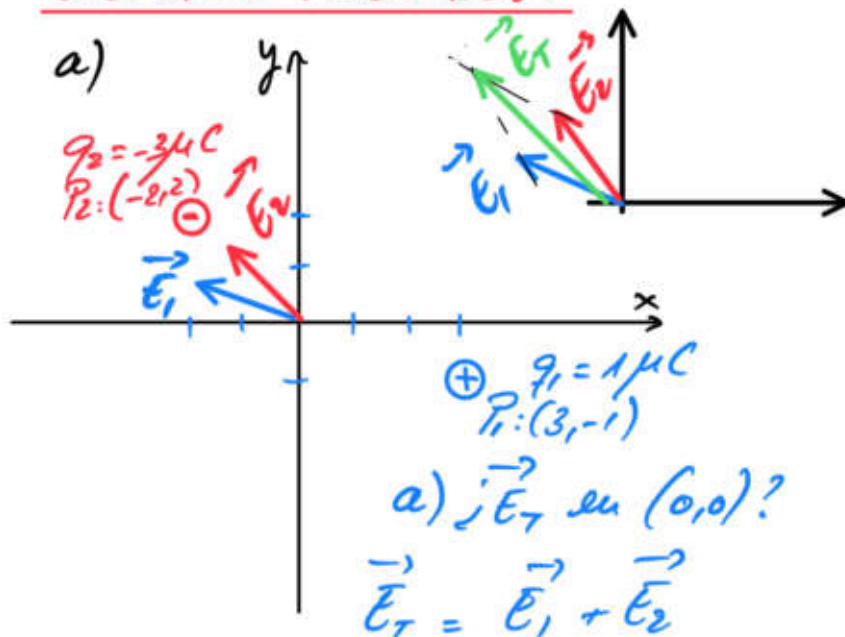


EXERCÍCIO F2BE2635:



$$\vec{E}_1 = k \cdot \frac{q_1}{r_1^2} \frac{\vec{r}_1}{r_1} = \dots$$

$$\vec{r}_1 = -3\vec{i} + \vec{j}; \quad |\vec{r}_1| = \sqrt{(-3)^2 + (-1)^2} = \sqrt{10} \text{ m}$$

$$\vec{E}_1 = 9 \cdot 10^9 \frac{(1 \cdot 10^{-6})}{(\sqrt{10})^2} \frac{-3\vec{i} + \vec{j}}{\sqrt{10}} =$$

$$\vec{E}_1 = -853,81 \vec{i} + 284,60 \vec{j} \left(\frac{\text{N}}{\text{C}} \right)$$

$$\vec{E}_2 = k \cdot \frac{q_2}{r_2^2} \frac{\vec{r}_2}{r_2} = \dots$$

$$\vec{r}_2 = 2\vec{i} - 2\vec{j}; \quad |\vec{r}_2| = \sqrt{2^2 + (-2)^2} = \sqrt{8} = 2\sqrt{2} \text{ m}$$

$$\vec{E}_2 = 9 \cdot 10^9 \frac{(-3 \cdot 10^{-6})}{(\sqrt{8})^2} \frac{2\vec{i} - 2\vec{j}}{\sqrt{8}} =$$

$$\vec{E}_2 = -2386,49 \vec{i} + 2386,49 \vec{j} \left(\frac{\text{N}}{\text{C}} \right)$$

$$\vec{E}_T = \vec{E}_1 + \vec{E}_2 = -3240,3 \vec{i} + 2671,09 \vec{j} \frac{\text{N}}{\text{C}}$$

$$|\vec{E}_T| = \sqrt{(-3240,3)^2 + (267,09)^2} \Rightarrow$$

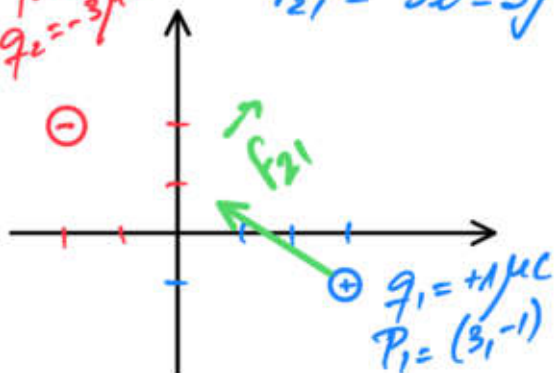
$$|\vec{E}_T| = E_T = 4199,32 \frac{N}{C}$$

\Rightarrow Indujo al inicio del ejercicio

b) \vec{F} que se hace sobre 1? $\vec{F}_{21}=?$

$$\vec{F}_{21} = k \frac{q_2 \cdot q_1}{r_{21}^2} \frac{\vec{r}_{21}}{r_{21}}$$

$q_2 = (-3 \mu C)$
 $q_1 = (+1 \mu C)$



$$\vec{r}_{21} = 5\vec{i} - 3\vec{j} \Rightarrow |\vec{r}_{21}| = \sqrt{5^2 + (-3)^2} = \sqrt{34} \text{ m}$$

$$\vec{F}_{21} = 9 \cdot 10^9 \frac{1 \cdot 10^{-6} \cdot (-3 \cdot 10^{-6})}{\sqrt{34}^2} \frac{5\vec{i} - 3\vec{j}}{\sqrt{34}}$$

$$\vec{F}_{21} = -6,81 \cdot 10^{-4} \vec{i} + 4,09 \cdot 10^{-4} \vec{j} \text{ (N)}$$

$$|\vec{F}_{21}| = \sqrt{(-6,81 \cdot 10^{-4})^2 + (4,09 \cdot 10^{-4})^2}$$

$$|\vec{F}_{21}| = 7,94 \cdot 10^{-4} \text{ N}$$

Indujo Indicado!

c) $V(0,0) = ?$

$$V(0,0) = V_1(0,0) + V_2(0,0) =$$

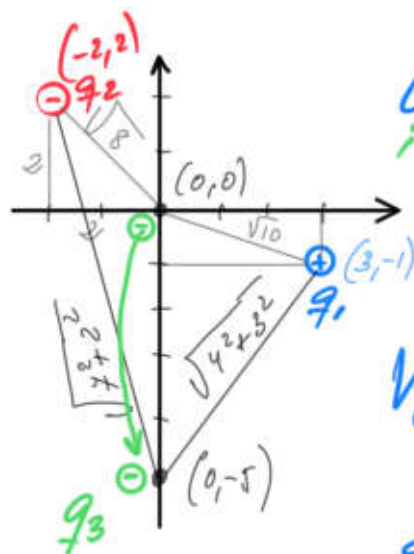
$$= k \cdot \frac{q_1}{r_1} + k \cdot \frac{q_2}{r_2} =$$

$$= 9 \cdot 10^9 \frac{1 \cdot 10^{-6}}{\sqrt{10}} + 9 \cdot 10^9 \frac{-3 \cdot 10^{-6}}{\sqrt{8}} =$$

$$= 2846,05 - 9545,94$$

$$V(0,0) = -6699,89 \text{ V}$$

d) $W_{(0,0) \rightarrow (0,-5)} = ?$ $q_3 = -4 \mu\text{C}$



$$W = -\Delta U = -q_3 \cdot (\Delta V) = -q_3 (V_f - V_i)$$

i F del campo!

$$W = -q_3 \cdot (V_{(0,-5)} - V_{(0,0)})$$

$$V_{(0,-5)} = k \frac{q_1}{r_1} + k \frac{q_2}{r_2} =$$

$$= 9 \cdot 10^9 \frac{1 \cdot 10^{-6}}{\sqrt{4^2 + 3^2}} + 9 \cdot 10^9 \frac{-3 \cdot 10^{-6}}{\sqrt{7^2 + 2^2}} =$$

$$= 1800 - 3708,74$$

$$V_{(0,-5)} = -1908,74 \text{ V}$$

$$W_{(0,0) \rightarrow (0,-5)} = -q_3 (V_{(0,-5)} - V_{(0,0)})$$

$$W = -(-4 \cdot 10^{-6}) \cdot (-1908,74 - (-6699,89))$$

$$W = 0,019 \text{ J}$$

Al ser positivo, lo realiza las Fuerzas del campo.