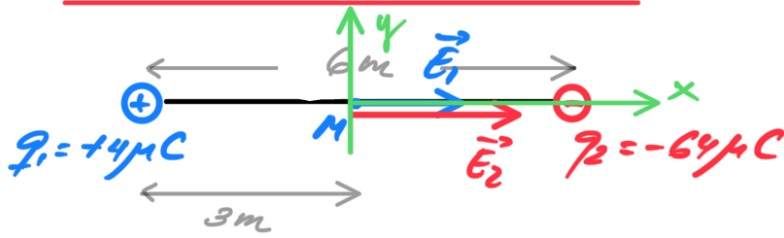


## EJERCICIO F2BE2590:



*¡ Porque tienen la misma dirección y sentido!*

a)  $\vec{E}_M = \vec{E}_1 + \vec{E}_2 \Rightarrow E_M = E_1 + E_2$

$$E_1 = k \frac{q_1}{r_1^2} = 9 \cdot 10^9 \cdot \frac{4 \cdot 10^{-6}}{3^2} = 4 \cdot 10^3 \frac{N}{C}$$

$$E_2 = k \frac{q_2}{r_2^2} = 9 \cdot 10^9 \cdot \frac{64 \cdot 10^{-6}}{3^2} = 64 \cdot 10^3 \frac{N}{C}$$

$$\begin{aligned} \vec{E}_1 &= 4 \cdot 10^3 \vec{i} \\ \vec{E}_2 &= 64 \cdot 10^3 \vec{i} \end{aligned} \quad \left\{ \vec{E}_M = 6,8 \cdot 10^4 \vec{i} \frac{N}{C} \right.$$



*puéde ser  
•  $E_1 \neq E_2$   
¡ distinto sentido!*

*No se anula: mismo sentido*

*No se anula  
 $E_2 \gg E_1$*

En P:  $E_1 = E_2$

$$k \frac{q_1}{x^2} = k \frac{q_2}{(6+x)^2} \Rightarrow$$

$$(6+x)^2 q_1 = q_2 \cdot x^2$$

$$\frac{(6+x)^2}{x^2} = \frac{q_2}{q_1} = \frac{64 \cdot 10^{-6}}{4 \cdot 10^{-6}} = 16$$

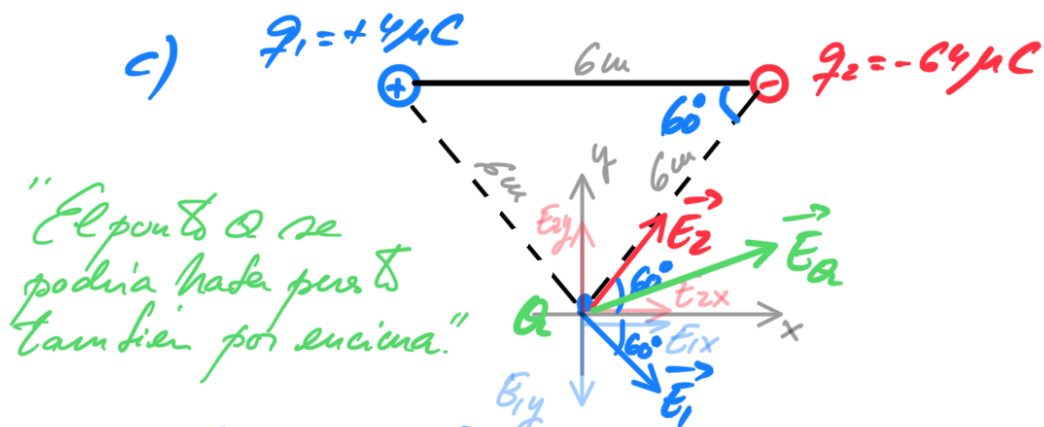
$$\sqrt{\frac{(6+x)^2}{x^2}} = \sqrt{16}$$

$$\frac{6+x}{x} = 4 \Rightarrow 6+x = 4x \Rightarrow 6 = 3x$$

*¡ a la izquierda de  $q_1$ !*

$x = 2 \text{ m}$

*¡ Importante:  
¡ Razonar las tres situaciones!*



$$\vec{E}_a = \vec{E}_1 + \vec{E}_2$$

$$\vec{E}_1 = E_1 \cos 60^\circ \vec{i} - E_1 \operatorname{sen} 60^\circ \vec{j}$$

$$\vec{E}_2 = E_2 \cos 60^\circ \vec{i} + E_2 \operatorname{sen} 60^\circ \vec{j}$$

$$E_1 = k \frac{q_1}{r_1^2} = 9 \cdot 10^9 \frac{4 \cdot 10^{-6}}{6^2} = 1000 \frac{\text{N}}{\text{C}}$$

$$E_2 = k \frac{q_2}{r_2^2} = 9 \cdot 10^9 \frac{64 \cdot 10^{-6}}{6^2} = 16000 \frac{\text{N}}{\text{C}}$$

$$\begin{aligned} \vec{E}_1 &= 1000 \cdot \cos 60^\circ \vec{i} - 1000 \operatorname{sen} 60^\circ \vec{j} = \\ &= 500 \vec{i} - 866,03 \vec{j} \end{aligned}$$

$$\begin{aligned} \vec{E}_2 &= 16000 \cos 60^\circ \vec{i} + 16000 \operatorname{sen} 60^\circ \vec{j} = \\ &= 8000 \vec{i} + 13856,41 \vec{j} \end{aligned}$$

$$\vec{E}_a = 8500 \vec{i} + 12990,38 \vec{j} \quad \left( \frac{\text{N}}{\text{C}} \right)$$

$$|\vec{E}_a| = 15524,17 \frac{\text{N}}{\text{C}}$$