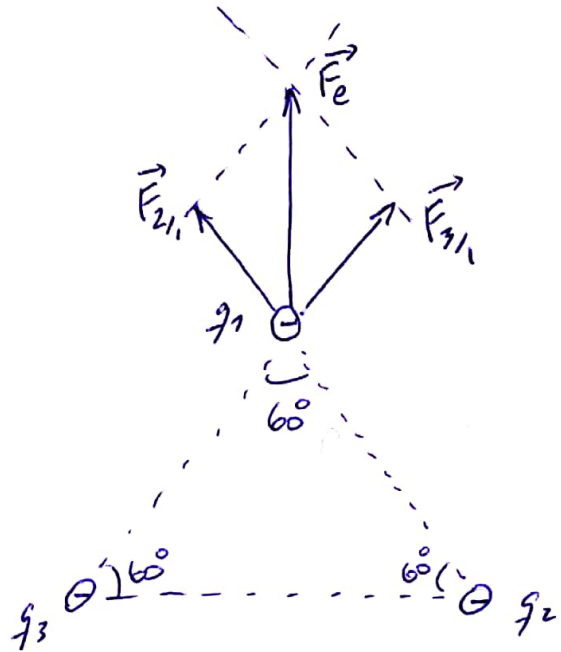


Ejercicio 2

②

2)

$$q_1 = q_2 = q_3 = -15 \text{ nC}$$



$$F_{3,1} = F_{2,1} = \frac{9,0 \times 10^9 \cdot 15 \times 10^{-9} \cdot 15 \times 10^{-9}}{3,0^2} = 2,3 \times 10^{-7} \text{ N}$$

$$\vec{F}_e = \vec{F}_{3,1} + \vec{F}_{2,1}$$

"CASO 4"

EL VALOR DE F_e ES :

$$F_e = \sqrt{(2,3 \times 10^{-7})^2 + (2,3 \times 10^{-7})^2 + 2 \cdot 2,3 \times 10^{-7} \cdot 2,3 \times 10^{-7} \cdot \cos(60)}$$

$$F_e = 4,0 \times 10^{-7} \text{ N}$$

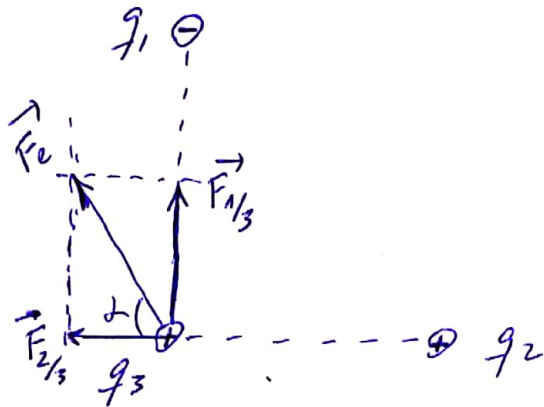
DIRECCIÓN VERTICAL
SENTIDO HACIA ARRIBA.

- x -

Ejercicio 2

③

$$3) \quad q_1 = -12 \times 10^{-12} \text{ C} \quad q_2 = 4,0 \times 10^{-12} \text{ C} \quad q_3 = 8,5 \times 10^{-12} \text{ C}$$



$$F_{1/3} = \frac{9,0 \times 10^9 \cdot 12 \times 10^{-12} \cdot 8,5 \times 10^{-12}}{3,0^2} = 1,0 \times 10^{-13} \text{ N}$$

$$F_{2/3} = \frac{9,0 \times 10^9 \cdot 4,0 \times 10^{-12} \cdot 8,5 \times 10^{-12}}{2,0^2} = 7,7 \times 10^{-14} \text{ N}$$

$$\vec{F}_e = \vec{F}_{1/3} + \vec{F}_{2/3}$$

"CASO 3" EL VALOR DE F_e ES: $F_e = \sqrt{F_{2/3}^2 + F_{1/3}^2}$

$$F_e = 1,3 \times 10^{-13} \text{ N}$$

Y SU DIRECCIÓN:

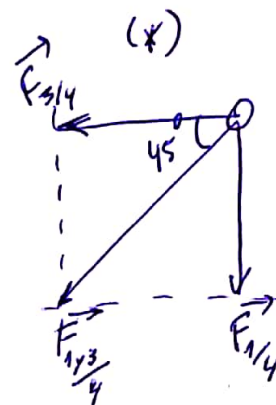
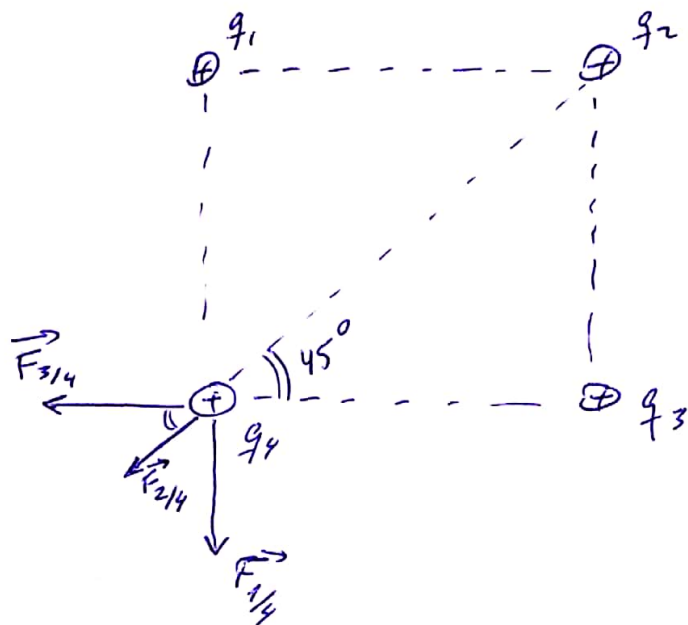
$$\alpha = \tan^{-1} \left(\frac{1,0 \times 10^{-13}}{7,7 \times 10^{-14}} \right) = 52^\circ$$

Ejercicio 2

(5)

4) $q_1 = q_2 = q_3 = q_4 = 30 \times 10^{-9} \text{ C}$

DETERMINAR \vec{F}_e SOBRE q_4 .



$$F_{114} = F_{314} = \frac{9,0 \times 10^9 \cdot 30 \times 10^{-9} \cdot 30 \times 10^{-9}}{(3,0)^2} = 9,0 \times 10^{-7} \text{ N}$$

$$F_{214} = \frac{9,0 \times 10^9 \cdot 30 \times 10^{-9} \cdot 30 \times 10^{-9}}{(4,2)^2} = 4,6 \times 10^{-7} \text{ N}$$

$$\vec{F}_e = \vec{F}_{114} + \vec{F}_{314} + \vec{F}_{214}$$

"CASO 3" $F_{143/4} = \sqrt{(9,0 \times 10^{-7})^2 + (9,0 \times 10^{-7})^2}$

$F_{143/4} = 12,7 \times 10^{-7} \text{ N}$

LUEGO "CASO 1"

$$F_e = 12,7 \times 10^{-7} + 4,6 \times 10^{-7} = \boxed{1,7 \times 10^{-6} \text{ N}}$$

$\swarrow 45^\circ$
 \vec{F}_e