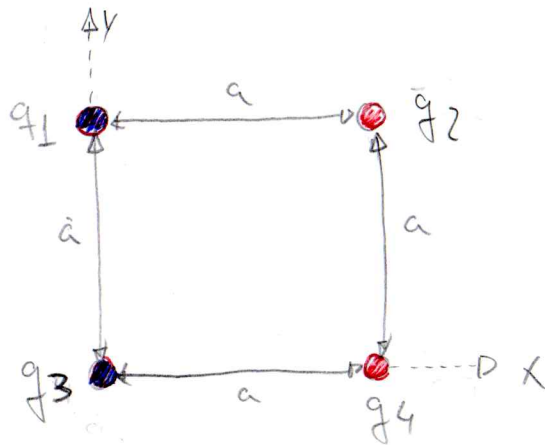


Cap. 21 - Ex 09



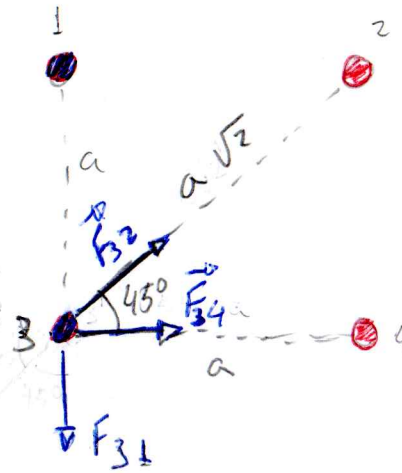
$$q_1 = -q_2 = 100 \text{ nC}$$

$$q_3 = -q_4 = 200 \text{ nC}$$

$$a = 5,0 \text{ cm}$$

Determinar $\vec{F} = F_x + F_y$
na carga q_3 .

Princípio da superposição



$$\vec{F}_{34} = +k \frac{|q_4| \cdot |q_3|}{a^2} \hat{i}$$

$$\vec{F}_{31} = -k \frac{|q_1| |q_3|}{a^2} \hat{j}$$

$$\vec{F}_{32} = \left(+k \frac{|q_2| |q_3|}{(a\sqrt{2})^2} \cdot \cos 45^\circ \hat{i} \right) + \left(+k \frac{|q_2| |q_3|}{(a\sqrt{2})^2} \cdot \sin 45^\circ \hat{j} \right)$$

$$\vec{F}_3 = \vec{F}_{34} + \vec{F}_{31} + \vec{F}_{32}$$

$$F_{3x} = +k \frac{|q_4| |q_3|}{a^2} +$$

$$+k \frac{|q_2| |q_3|}{(a\sqrt{2})^2} \cdot \frac{\sqrt{2}}{2}$$

$$F_{3x} = +k \cdot \frac{2(100 \text{ nC})^2}{(0,05)^2} \left(\frac{1}{2\sqrt{2}} + 2 \right)$$

$$\underline{\underline{F_{3x} \simeq +0,17 \text{ N}}}$$

$$F_{3y} = -k \frac{|q_1| |q_3|}{a^2} +$$

$$+k \frac{|q_2| |q_3|}{(a\sqrt{2})^2} \cdot \frac{\sqrt{2}}{2}$$

$$F_{3y} = k \frac{2(100 \text{ nC})^2}{(0,05)^2} \cdot \left(-1 + \frac{1}{2\sqrt{2}} \right)$$

$$\underline{\underline{F_{3y} \simeq -0,046 \text{ N}}}$$