



UNIVERSIDAD DE SAN CARLOS DE GUATEMALA
FACULTAD DE INGENIERÍA
ESCUELA DE CIENCIAS
DEPARTAMENTO DE FÍSICA

F2 B	Nota:
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AUX. CESAR FERNANDEZ	

TAREA
HOJA DE TRABAJO
EXAMEN CORTO

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No.
3

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Capítulo 23 Potencial Eléctrico

23.1

#1

$$q_1 = +2.40 \mu\text{C}$$

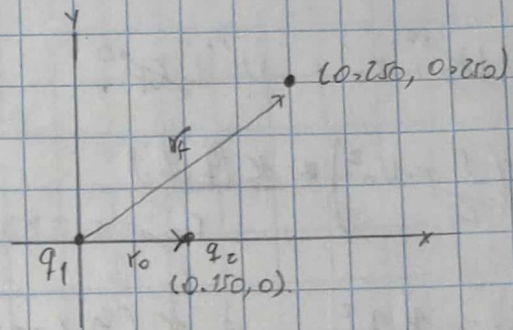
$$q_2 = -4.30 \mu\text{C}$$

$$x_0 = 0.150 \text{ m}$$

$$x_f = 0.250 \text{ m}$$

$$y_0 = 0$$

$$y_f = 0.250 \text{ m}$$



$$r_f = \sqrt{0.250^2 + 0.250^2}$$

$$r_f = 0.3536 \text{ m}$$

$$W_{\text{ext}} = U_0 - U_f$$

$$U_0 = k \frac{(2.40 \mu\text{C})(-4.30 \mu\text{C})}{0.15} = -0.61845$$

$$U_f = k \frac{(2.40 \mu\text{C})(-4.30 \mu\text{C})}{0.3536} = -0.2623 \text{ J}$$

$$W = -0.6184 - (-0.2623) = -0.356 \text{ J}$$

$$W = -0.356 \text{ J. #}$$

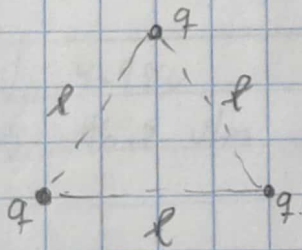
23.3

#2

$$l = 2.00 \times 10^{-15} \text{ m}$$

$$q = +1.6022 \times 10^{-19} \text{ C}$$

$$U = k \left(\frac{3q}{r} \right) = k \left(\frac{3(1.6022 \times 10^{-19})}{2 \times 10^{-15}} \right) =$$



$$U = 3.46 \times 10^{-13} \text{ J}$$

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$$V_0 = 2 \times 10^5 \text{ m/s} ; m_p = 1.6726 \times 10^{-27} \text{ kg}$$

$$V_0 + K_0 = V_f + K_f$$

$$\frac{1}{2} m V_0^2 = \frac{K (q, q)}{r_2}$$

$$r_2 = \frac{K q^2}{m V_0^2} = \frac{K (1.6022 \times 10^{-19})^2}{(1.6726 \times 10^{-27}) (2 \times 10^5)^2} = 3.45 \times 10^{-12} \text{ m}$$

$$F = \frac{K q^2}{r^2} = \frac{K (1.6022 \times 10^{-19})^2}{(3.45 \times 10^{-12})^2} = 1.94 \times 10^{-5} \text{ N}$$

$$F = 1.94 \times 10^{-5} \text{ N}$$

23.15

#4

$$q = 28.0 \text{ nC}$$

$$E = 4.00 \times 10^4 \text{ V/m}$$

$$a) 0.450 \text{ m} \rightarrow$$

$$W = E d = 0$$

$$W = 0$$

$$b) 0.670 \text{ m} \uparrow$$

$$W = (28.0 \times 10^{-9}) (4.00 \times 10^4) (0.670) = 7.50 \times 10^{-4} \text{ J}$$

$$W = 7.50 \times 10^{-4} \text{ J}$$

$$c) 2.60 \text{ m } 45^\circ \text{ CW}$$

$$r = -2.60 \sin 45^\circ = -1.838 \text{ m}$$

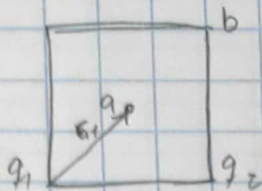
$$W = (28 \times 10^{-9}) (4 \times 10^4) (-1.838) = -2.06 \times 10^{-3} \text{ J}$$

$$W = -2.06 \times 10^{-3} \text{ J}$$

$$q_1 = +2.00 \mu\text{C}$$

$$q_2 = -2.00 \mu\text{C}$$

$$l = 3.00 \text{ cm} = 0.03 \text{ m}$$



$$a) r_{a1} = r_{a2} = \sqrt{(0.015)^2 + (0.015)^2} = 0.0212 \text{ m}$$

$$V_a = k \left(\frac{2 \mu\text{C}}{0.0212} - \frac{2 \mu\text{C}}{0.0212} \right) = 0$$

$$V = 0$$

$$b) r_{b1} = 0.0424$$

$$r_{b2} = 0.0300 \text{ m}$$

$$V = k \left(\frac{2 \mu\text{C}}{0.0424} + \frac{(-2 \mu\text{C})}{0.03} \right) = -1.75 \times 10^5 \text{ V}$$

$$V = -1.75 \times 10^5 \text{ V}$$

$$c) q_3 = -5.00 \mu\text{C}$$

$$W = q (V_a - V_b) = (-5 \times 10^{-6}) (0 - (-1.75 \times 10^5)) = -0.875 \text{ J}$$

$$W = -0.875 \text{ J}$$

$$V = 4.98 \text{ V}$$

$$E = 16.2 \text{ V/m}$$

$$a) \frac{V}{E} = \frac{kq/r}{k(9.1/r^2)}$$

$$\Rightarrow r = \frac{4.98}{16.2} = 0.307 \text{ m}$$

$$r = 0.307 \text{ m}$$

$$b) q = \frac{(0.307)(4.98)}{8.99 \times 10^9} = 1.70 \times 10^{-10} \text{ C}$$

$$q = 1.70 \times 10^{-10} \text{ C}$$

c) Se dirige a la carga.