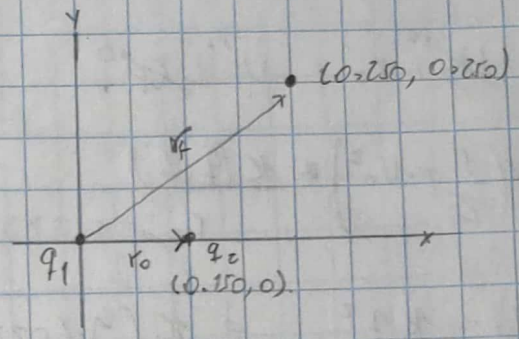
Capítulo 23 Potencial Eléctrico.

23.1 #1

$q_1 = +2.40\ \mu C$
$q_2 = -4.30\ \mu C$
$x_0 = 0.150\ m$ $x_f = 0.250 m$
$y_0 = 0$ $y_0 = 0.250 m$



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

$r_f = 0.3536\ m$

$W_{0\to f} = U_0 - U_f$ $\quad U_0 = k\frac{(2.40\mu)(-4.30\mu)}{0.15} = -0.6184$

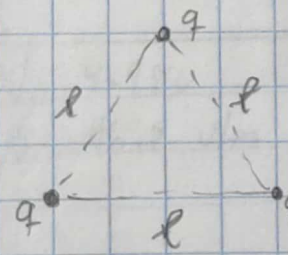
$U_f = k\frac{(2.40\mu)(-4.30\mu)}{0.3536} = -0.2623\ J$

$W = -0.6184 + (+0.2623) = -0.356\ J$

$W = -0.356\ J.$ //

23.3 #2

$l = 2.00 \times 10^{-15}\ m.$
$q = +1.60218 \times 10^{-19}\ C$ $\quad U = k\left(\frac{3q}{r}\right) = k\left(\frac{3(1.60218\times10^{-19})}{2\times10^{-15}}\right) =$



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

$U = 3,46 \times 10^{-13}\ J.$ //

83.7.

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

$\cancel{U_0^{\to 0}} + K_0 = U_f + \cancel{K_f^{\to 0}}$

$\frac{1}{2} m V_0^2 = \frac{k(q\,q)}{r_{12}}$

$r_{12} = \frac{k q^2}{m V_0^2} = \frac{k (1.6022 * 10^{-19})^2}{(1.6726 * 10^{-27})(2*10^5)} = 3.45 * 10^{-12}$ m.

$F = \frac{k q^2}{r^2} = \frac{k (1.6022 * 10^{-19})^2}{(3.45) * 10^{-12})^2} = 1.94 * 10^{-5}$ N.

$F = 1.94 * 10^{-5}$ N. #4

23.15

$q = 28.0$ nC

$E = 4.00 * 10^4$ V/m

a) 0.450m →

$W = E\ell = \emptyset$.

$W = 0$ #1

b) 0.670m ↑

$W = (28.0 * 10^{-9})(4. * 10^4)(0.670) = 7.50 * 10^{-4}$ J.

$W = 7.50 * 10^{-4}$ J. #1

c) 2.60m 45° ↷

$r = -2.60 \sin 45° = -1.838$ m.

$W = (28 * 10^{-4})(4 * 10^4)(-1.838) = -2.06 * 10^{-3}$ J.

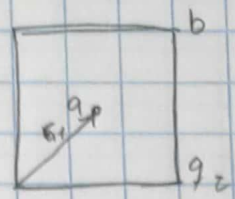
$W = -2.06 * 10^{-3}$ J #1

23.17 #5

$q_1 = +2.00\ \mu C$

$q_2 = -2.00\ \mu C$

$l = 3.00\ cm = 0.03\ m$



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

$V_a = K\left(\frac{2\mu}{0.0212} - \frac{2\mu}{0.0212}\right) = 0.$

$V = 0.$ ✓

b) $r_{b1} = 0.0424$

$r_{b2} = 0.0300\ m.$ $\quad V = K\left(\frac{2\mu}{0.0424} + \frac{(-2\mu)}{0.03}\right) = -1.75\times10^5\ V.$

$V = -1.75\times10^5\ V$ ✓

c) $q_3 = -5.00\ \mu C$

$W = q(V_a - V_B) = (5\times10^{-6})(0 - (-1.75\times10^5) = -0.875\ J$

$W = -0.875\ J.$ ✓

23.22 #6

$V = 4.98\ V$

$E = 16.2\ V/m$

a) $\frac{V}{E} = \frac{Kq/r}{K|q|/r^2}$

$\Rightarrow r = \frac{4.98}{16.2} = 0.307\ m.$ $\quad r = 0.307\ m.$ ✓

b) $q = \frac{(0.307)(4.98)}{8.99\times10^9} = 1.70\times10^{-10}\ C$ $\quad q = 1.70\times10^{-10}$ ✓

c) Se dirige a la carga.