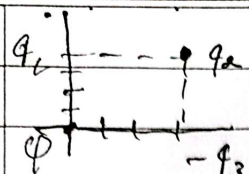
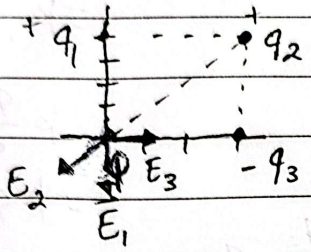
Nama : Wahyu Farhan Amrulloh
NPM : 2313022022

No.
Date :



a. hitung medan listrik di titik (0,0)
b. hitung gaya listrik di titik (0,0)
c. hitung potensial listrik di titik (0,0)
d. hitung usaha φ memindahkan q_2 dari y mendekati

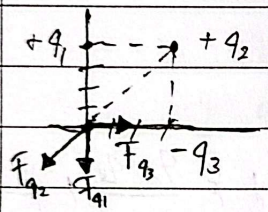
a



$$E_\varphi = k\left[\frac{q_1}{4^2}(-\hat{j}) + \frac{q_2}{5^2}\left(\frac{-3\hat{i}-4\hat{j}}{5}\right)\right]$$

$$E_\varphi = k\left[\frac{q_1}{4^2}(-\hat{j}) + \frac{q_2}{5^2}\left(\frac{-3\hat{i}-4\hat{j}}{5}\right) + \frac{q_3}{3^2}(\hat{i})\right]$$

b.



$$F_\varphi = k\varphi\left[\frac{q_1}{4^2}(-\hat{j}) + \frac{q_2}{5^2}\left[\frac{-3\hat{i}-4\hat{j}}{5}\right] + \frac{q_3}{3^2}(\hat{i})\right]$$

$$= k\varphi\left[\left[\frac{3q_1}{5^3} + \frac{4q_3}{3^2}\right]\hat{i} + \left[-\frac{q_1}{4^2} - \frac{4q_2}{5^3}\right]\hat{j}\right]$$

c. $$V_\varphi = k\left[\frac{q_1}{4} + \frac{q_2}{5} - \frac{q_3}{3}\right]$$

d. $W_\varphi = 0$

$W_{q_1} = V_\varphi\, q_1$
$= k\frac{\varphi}{4}\cdot q_1$

$W_{q_2} = V_1\, q_2 + V_3\, q_2$
$= k\frac{q_1}{5} q_2 + k\frac{q_3}{5} q_2$
$= k$

$W_{q_3} = V_\varphi\, q_3$
$= k\frac{\varphi}{3} q_3$

$W_{tot} = W_1 + W_2 + W_3 + W_4$
$= 0 + k\frac{\varphi}{4} q_1 + k\frac{\varphi}{3} q_3 + k\frac{q_1}{5} q_2 + k\frac{q_3}{5} q_2$

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