A 12 μc charge is place at the origin. A second -8.0 μc charge is placed 1.04cm to the right of the first. A third 6.0 μc charge is placed 1.0m above the first charge. What is the force on second charge due the other two?

Solution

$$F_{21} = (9 \cdot 10^9) \frac{(8 \cdot 10^{-6})(12 \cdot 10^{-6})}{(0.0104)^2} = 7988 \ N.$$

$$F_{23} = (9 \cdot 10^9) \frac{(8 \cdot 10^{-6})(6 \cdot 10^{-6})}{(0.0104)^2 + (0.01)^2} = 2075 \ N.$$

$$F_X = 7988 + 2075 \cos\left(\tan^{-1}\left(\frac{1}{1.04}\right)\right) = 9484 \ N.$$

$$F_y = 2075 \sin\left(\tan^{-1}\left(\frac{1}{1.04}\right)\right) = 1438 \ N.$$

$$F = \sqrt{9484^2 + 1438^2} = 9.6 \ kN.$$

Answer: 9.6 kN.

Answer provided by https://www.AssignmentExpert.com