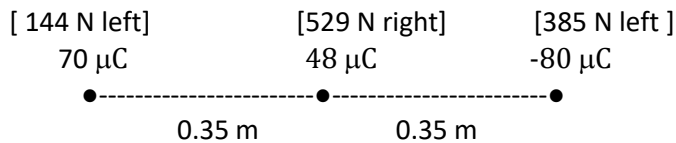


Directions: Show all your work and label all units, not just answers, but label all work as you solve each problem, show steps to solutions. Explain answers when necessary. (Pages 657-671)

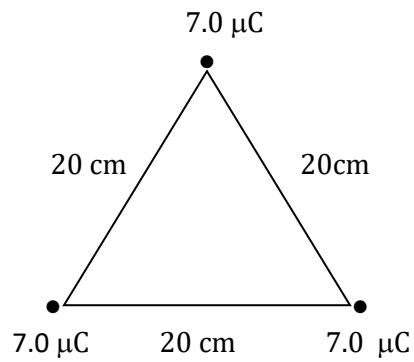
1. (I) Two charged bodies exert a force of 0.48 N on each other. What will be the force if they are moved so they are only one eighth ($1/8$) as far apart? [30.72 N]

2. (I) How many electrons make up a charge of $100 \mu\text{C}$? [6.25×10^{14} electrons]

3. (II) Particles of charge $+70$, $+48$, and $-80 \mu\text{C}$ are placed in a line seen below. The center one is 0.35 m from each of the others. Calculate the net force on each due to the other two.



4. (II) Three positive particles of charges $7.0 \mu\text{C}$ are located at the corners of an equilateral triangle with 20 cm sides. Calculate the magnitude and direction of the net force on each particle. [19.1 N @ 30° shown on diagram]

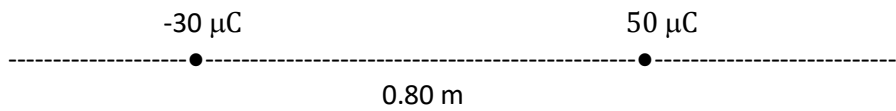


5. (I) What is the magnitude of the force on an electron in an electric field of 800 N/C ? [$1.28 \times 10^{-16} \text{ N}$]

6. (II) What is the magnitude and direction of the electric field at a point midway between a $-8.0 \mu\text{C}$ and a $+6.0 \mu\text{C}$ charge 4.0 cm apart? [$3.15 \times 10^8 \text{ N/C}$, Left]

7. (II) What is the acceleration of an electron in a 3500 N/C Electric field? [$6.15 \times 10^{14} \text{ m/s}^2$]

8. (III) Two charges below are separated by a distance of 0.80 m. Where along the line separating them can we place a point charge such that it feels no electrical force? [2.75 m left of the $-30 \mu\text{C}$ charged particle]



9. You are given two unknown point charges, Q_1 and Q_2 . At a point on the line joining them, one-fourth of the way from Q_1 to Q_2 , the electric field is zero. What can you say about these two charges? [$Q_1 < Q_2$. Q_2 is 9 times greater than Q_1].

10. Draw the Electrical Field charges that surround two charges near each other if:

- a. one is positive, one negative b. both negative c. both positive