

Worksheet 6.01 Electrostatic Force

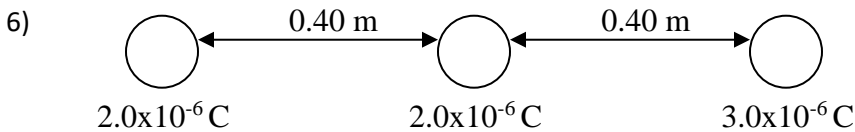
1) Calculate the electric force between two point charges of $4.00 \mu\text{C}$ and $3.00 \mu\text{C}$ when they are 2.00 cm apart.
(270 N)

2) Two points of equal charge produce an electric force on each other of $3.40 \times 10^{-2} \text{ N}$ when placed 0.100 m apart. What is the charge on each point?
($1.94 \times 10^{-7} \text{ C}$)

3) How far apart are two point charges of $2.0 \times 10^{-6} \text{ C}$ and $4.0 \times 10^{-6} \text{ C}$ if they produce an electric force of 0.56 N ?
(0.36 m)

4) Two point charged objects produce an electric force on each other of $6.20 \times 10^{-2} \text{ N}$. What will the force between them be if the distance between increases three-fold? ($6.89 \times 10^{-3} \text{ N}$)

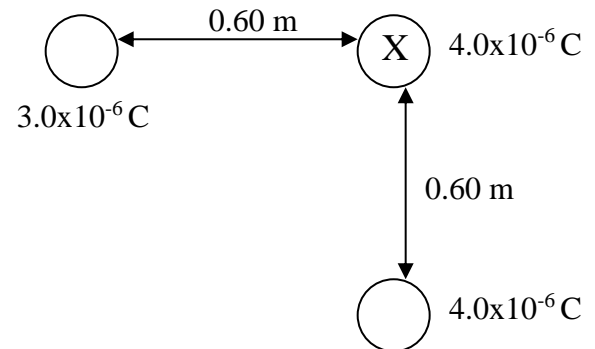
5) Two point charges produce a force between on each other of $4.5 \times 10^{-3} \text{ N}$. What is the force between them if the charge on each triples and the distance between them doubles? ($1.0 \times 10^{-2} \text{ N}$)



Three charged objects are placed in a line as shown. Calculate the force on the middle object due to the other charges.
($1.1 \times 10^{-1} \text{ N}$ left)

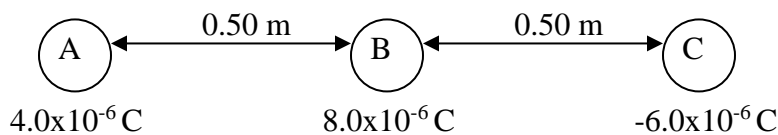
7) The electric force between two charged particles is $5.2 \times 10^{-4} \text{ N}$ when the objects are 0.311 m apart. What is the force between these objects if the distance changed to 0.404 m ? ($3.1 \times 10^{-4} \text{ N}$)

8) Three point charges are placed at the corner of a right angle triangle as shown. Calculate the magnitude of the net electric force on the object marked X due to the other two charges.
($5.0 \times 10^{-1} \text{ N}$)



9) Two small spheres, each with a mass of $2.00 \times 10^{-5} \text{ kg}$ are placed $3.50 \times 10^{-1} \text{ m}$ apart. One sphere has a charge of $-2.00 \mu\text{C}$ and is fixed in position. The other sphere has a charge of $-3.00 \mu\text{C}$ but is free to move without friction. What is the initial acceleration of the free object?
($2.20 \times 10^4 \text{ m/s}^2$)

Use the following diagram to answer questions 10-12



10) What is the net force on A? (0.94 N left)

11) What is the net force on B? (2.88 N right)

12) What is the net force on C? (1.944 N left)

13) Charge A was taken away from the setup above. Where could we put charge A, so that charge A will not move? (3.2 m left from C)