

Name: \_\_\_\_\_ Section: \_\_\_\_\_ Score: \_\_\_\_\_/20

1. Very small metal spheres A and B are with glass handles as in Fig. 1. Initially, A has no net charge and B has a net charge  $Q$ . After the metal spheres are connected, they are separated and placed as in the right-lower figure.

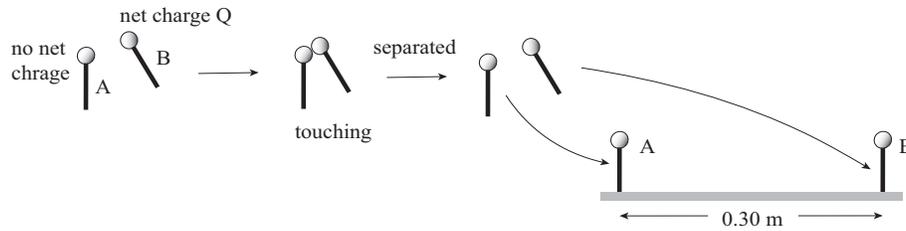


Figure 1:

(a) The magnitude of the force acting on charge at A is 16 N. What is the original net charge  $Q$  on B before touching with A. [5]

(b) If the initial net  $Q$  were halved, what would have been the force acting on A after performing the same procedure in the problem? [5]

2. Look at the configuration of three charges in the figure 2. A and C have  $-3 \mu\text{C}$  and B  $1 \mu\text{C}$ .

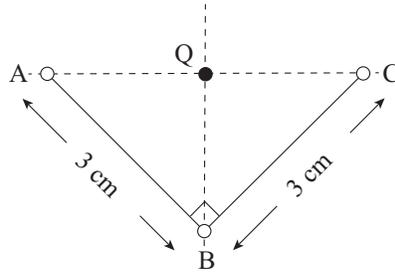


Figure 2:

(a) What is the total force acting on  $B$  from the other charges at  $A$  and  $C$ ? Compute its magnitude and indicate its direction in the figure 2. [5]

(b)  $Q$  is the point equidistant from all three points  $A$ - $C$  and on the line connecting  $A$  and  $C$ . What is the total force acting on a  $4 \mu\text{C}$  charge placed at  $Q$ ? Compute its magnitude and indicate its direction in the figure 2. [5]