

Name _____

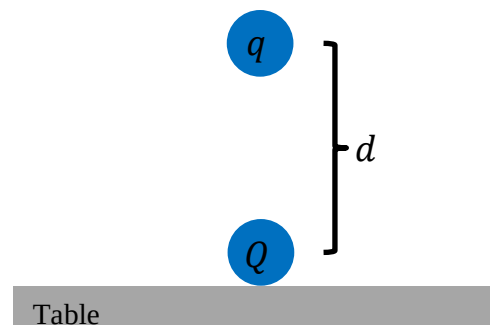
Physics 111 Quiz #1, September 9, 2024

Please show all work, thoughts and/or reasoning to receive partial credit. The quiz is worth 10 points total, and all parts may not be of equal weight.

I affirm that I have carried out my academic endeavors with full academic honesty.

1. Consider an arrangement of three point-charges $q_1 = +3\mu C$, $q_2 = -4\mu C$ and $q_3 = +4\mu C$ placed along the x-axis. Point charge q_1 is located at a point $(x, y) = (0, 0)$, point charge q_2 at $(x, y) = (10, 0)$, and point charge q_3 at $(x, y) = (30, 0)$, where the distances are measured in centimeters. What is the net electrostatic force in magnitude and direction on point-charge q_2 ?

2. Suppose that you have a point-charge $Q = +7\mu C$ sitting at rest on a table and that directly above this point-charge Q you want to suspend a second point-charge q . If the point-charge q of mass $m = 0.2kg$ is located at a distance of $d = 0.25m$ above point-charge Q explain what the sign of point-charge q would have to be for it to remain at rest above point-charge Q ?



3. What would be the magnitude of point-charge q so that it would be suspended directly above point-charge Q ?

4. A $m = 0.020\text{g}$ plastic bead hangs from a lightweight thread. Another bead is fixed in position directly below the point where the thread is tied. If both beads have charge q , the movable bead swings out to the position shown. What is the value of the charge q ?

