Name:_____ **Date:**_____

7. Q|C (a) Two protons in a molecule are 3.80×10^{-10} m apart. Find the magnitude of the electric force exerted by one proton on the other. (b) State how the magnitude of this force compares with the magnitude of the gravitational force exerted by one proton on the other. (c) **What If?** What must be a particle's charge-to-mass ratio if the magnitude of the gravitational force between two of these particles is equal to the magnitude of electric force between them?

Name:_____ **Date:**_____

8. Three point charges lie along a straight line as shown in Figure P23.8, where $q_1 = 6.00\ \mu C$, $q_2 = 1.50\ \mu C$, and $q_3 = -2.00\ \mu C$. The separation distances are $d_1 = 3.00$ cm and $d_2 = 2.00$ cm. Calculate the magnitude and direction of the net electric force on (a) q_1, (b) q_2, and (c) q_3.

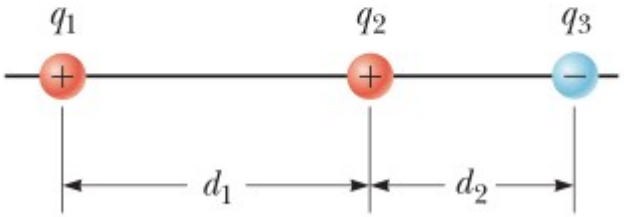

Figure P23.8

Name:_____ **Date:**_____

11. **Q|C** Two small beads having positive charges $q_1 = 3q$ and $q_2 = q$ are fixed at the opposite ends of a horizontal insulating rod of length $d = 1.50$ m. The bead with charge q_1 is at the origin. As shown in Figure P23.11, a third small, charged bead is free to slide on the rod. (a) At what position x is the third bead in equilibrium? (b) Can the equilibrium be stable?

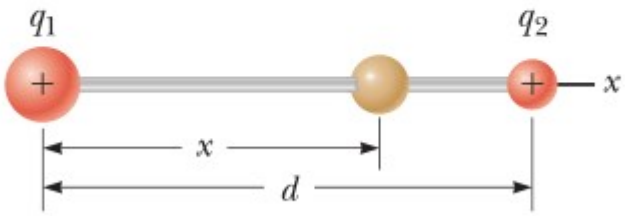

Figure P23.11 Problems 11 and 12.