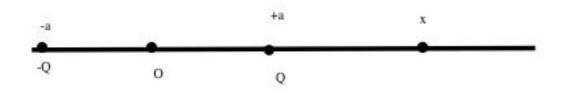# S11 PHY114 Problem Set 2

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1 Due Monday 31 Jan 2011

1. The electric field midway between two equal but opposite charges is $600NC^{-1}$. The distance between them is 10 cm. What is the magnitude of the charge on each?

2. A charge Q is transferred from an initially uncharged spherical ball to another identical ball, placed 10 cm away. The force of attraction between them is found to be 15mN. How many electrons where transferred?

3. The electric field at some point is $(1.1\hat{\mathbf{i}} + 3.9\hat{\mathbf{j}}) \times 10^6 NC^{-1}$. What is the magnitude of the force on a charge $-4.2\mu C$ placed at that point? What is the angle that direction of the force vector makes with the x-axis?

4. An electron with initial velocity $25 \times 10^6 \hat{\mathbf{i}} ms^{-1}$ is travelling parallel to a constant electric field $10^4 \hat{\mathbf{i}} NC^{-1}$. How long will it take for the electron to stop? How far will it travel before it stops?

5. A positive charge Q is located at the position a along the x-axis; and another charge $-Q$ is at the position $-a$ also along the x axis. What is the electric field atposition x, assuming that $x > a$? Express the answer in terms of the variables Q, x, a as well as the constant k.