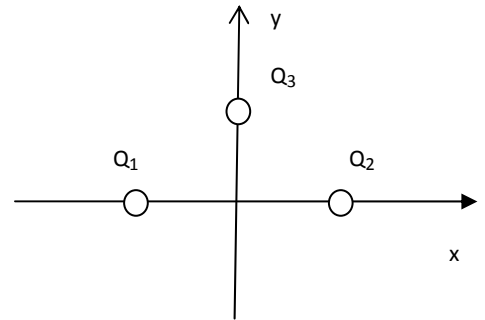ELECTRIC FIELD OF POINT CHARGES

In this lab, at first, you will solve the two following problems and then you will check if your solutions make sense by using the simulator of EM field in computer. At the end of lab you should hand in one set of solutions per pair of students.

1] Three point charges are arranged as follows:

  Q_1= +q is located at (-a, 0) Q_2= +q is located at (+a, 0)

  Q_3= -q is located at (0, +a)

  1.a Calculate the electric field at the origin O(0,0) and at point P(0, -a)

  1.b There are two points in the space around these charges where the field strength is zero.
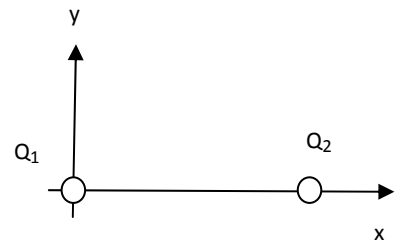
    Find where they should be located approximately. Sketch a vector diagram of three field

    vectors at these points and show how they add to zero.

  1.c Use the program EM fields to draw the field lines out to at least 3a from the origin in all

    directions. Print the diagram and mark on it the location of two points with field zero.

2] Two point charges are arranged as follows:

  Q_1= +q is located at the origin O(0,0)

  Q_2= -4q is located at x=a, y=0.

  2.a Calculate the coordinates of a point P (not at infinity) in the field where E=0.

  2.b Use the program EM field to draw the field lines out to at least 2a from the origin in all

    directions. Print the diagram and mark on it the location of the point P where the field is zero.