Exercises Series N°2

Exercise 1:

Three charges on a line. q_1 at x=0,

q_2 at x=0.2m, Q at x=0,30m.

$\vec{F}_2 = 240\ \vec{\imath}\ (N)$, q_1= -3.0 µC, q_2=+4.0 µC.
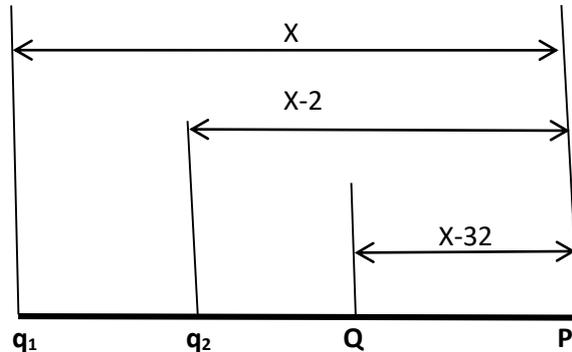
1/ determine Q.

2/find x so that E(x)=0.

Figure 1

Exercise2:

We place four point charges at the vertices A,B,C,D of a square with side a=1m and center O the origin of an orthonormal frame Oxyz of unit vectors $\vec{u}_x$ and $\vec{u}_y$ we give

q_1=q=10^{-8}C ; q_2=-2q ; q_3=2q ; q_4=-q.

1/Determine the electric field $\vec{E}(O)$ created by the distribution of charges at the center O of the square. Specify the direction, sense and magnitude of $\vec{E}(O)$.

2/Express the potential V created at O by the four charges.

3/ Express the potential V(M) at any point M of the segments II' and JJ'. Deduce the value of the potential at the midpoints I, I', J and J' of the sides of the square.

Exercise 3:

Three point charges are located at the corners c f an equilateral triangle, as shown in **figure 2** .

a) Calculate the electric field at a point P located midway between

the two charges on the x-axis.

b) If a charge of 1 µC is placed at P,

 determine the force
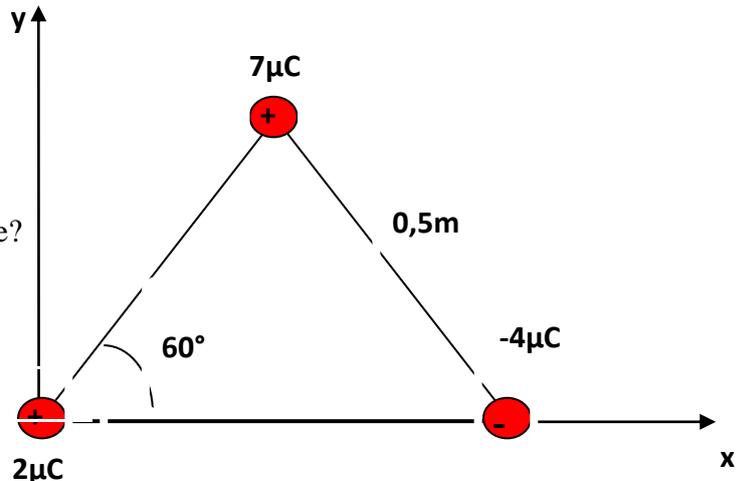
(direction and magnitude) acting on this particle?

Figure 2