University Centre Abdelhafid Boussouf-Mila
Institute of Math And Informatics
Department of Informatics

1st Year licence Informatics
Physics 02

Exercises Series N°1

Exercise 1:

Three point charges lie along the ***x*** axis as shown in figure .1. The positive charge q_1**=15µC** is at **x=2 m**, the positive charge q_2**=6µC** is at origin, and the resultant force acting on q_3 is **zero**. What is the ***x*** coordinating of q_3?

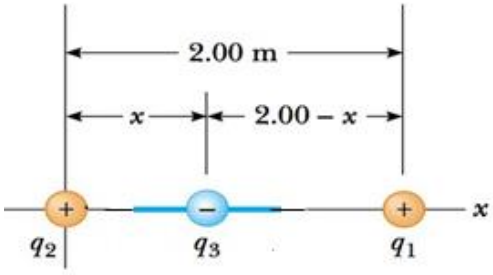


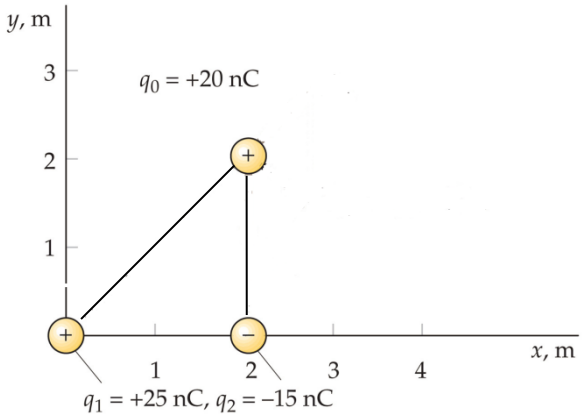
Figure.1

Exercise 2:

Three charges are placed on three corners of a triangle, as shown in the figure.2.

a) Find the resultant force exerted on q_0.

Figure.2



Exercise 3:

Three charges on a line. q_1 at x=0; q_2 at x = 0.2 m; Q at x = 0.32m. $\vec{F}_2 = 240\,\vec{\imath}$ N, q_1 = -3.0µC, q_2 = +4.0µC.

a) Determine Q;

b) **Find** x so that $E(x)=0$.

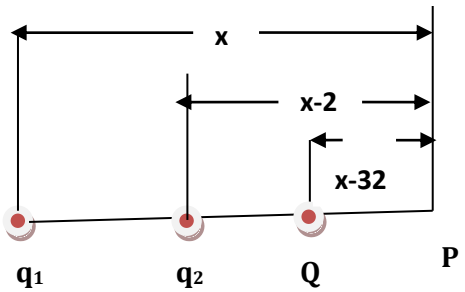


Figure.3

Exercise 4:

Three charges are placed on three corners of a square, as shown in the figure.**4**. Each side of the square is ***30.0 cm***.

a) **Calculate** the electric field strength at point ***A***.

Exercises Series N°1

b) **Find** the total potential field at point ***A***.

What would be the force on a ***6.00 μC*** charge placed at the point ***A***?

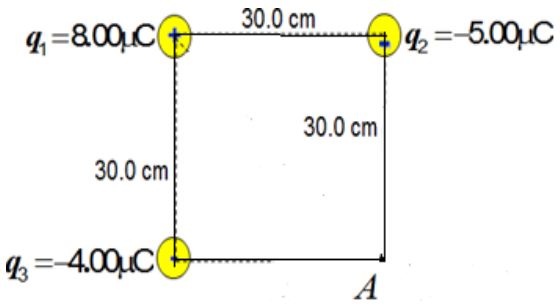


Figure.4

Exercise 5:

Calculate the magnitude and direction of the total electric field the point ***P*** due to the charges shown in the arrangement (figure.5). ***q₁*=+7nC, *q₂*=-9nC, *q₃*=-5 nC, r₁=5cm, r₃=8cm.**

a) **Draw** the vector diagram for the electric field at ***P*** due to all the charges.

b) **Calculate** the magnitude of the total electric field at point ***P***.

c) **Find** the total potential field at point ***P***.

d) **Find** the change in potential energy of the system as latter the charge moves from infinity to point ***P***.

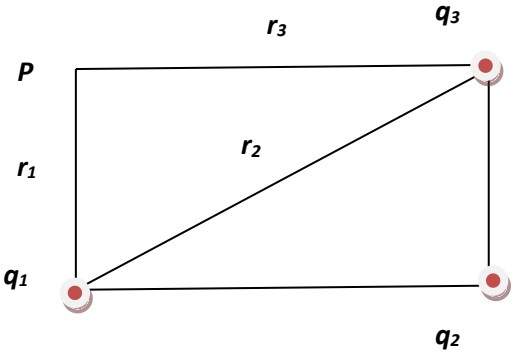


Figure.5

Exercise 6:

Three point charges are located at the corners of an equilateral triangle, as shown in figure.6.

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?

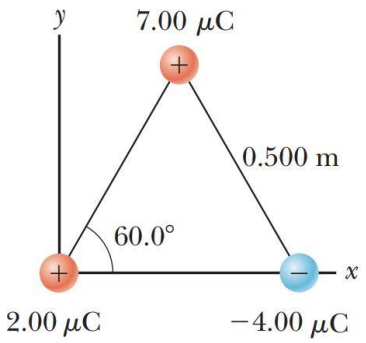


Figure.6