

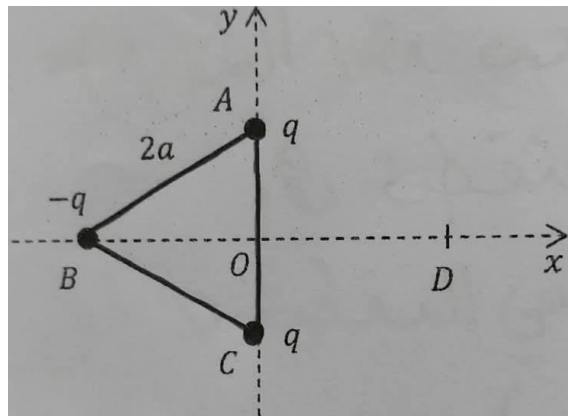


Homework

Exercise 1:

In vacuum, three point charges are located at the vertices of an equilateral triangle ABC of side length $2a$. Calculate:

- The electric potential at point B.
- The potential energy of the charge $-q$.
- The magnitude of the electric field at point D, which is the symmetric of point B with respect to point A, with a diagram.



Exercise 2:

1) Calculate, at any point M in space, the electric field \vec{E} created by a rectilinear wire AB of finite length $2a$, carrying a linear density of charges $\lambda > 0$.

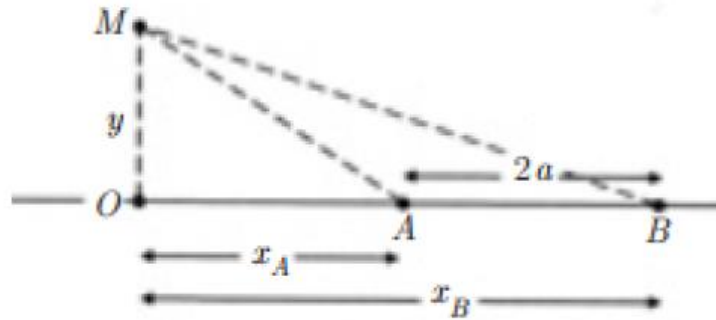
Let O be the projection of M on the line AB, we give:

$$OM = y, OA = x_A, OB = x_B$$

2) The following particular cases will be examined:

a) point M is in the mediating plane of AB ,

b) the wire has infinite length.



Exercise 3:

A solid cylinder of infinite length and radius R carries a uniform volume charge density ρ .

1- Using Gauss's theorem, calculate the electrostatic field inside, on the surface, and outside the cylinder.

2- Deduce the electric potential inside, on the surface, and outside the cylinder, assuming that $V=0$ on the axis of the cylinder.