
SERIES N°4

Exercise 1: Two charges (+q) and (-q) are placed at two points A and B separated by a distance a.

- 1- Determine the potential created by the dipole at a point M in space, at distances r_A and r_B .
- 2- Calculate the field created by this dipole at point M.

Exercise 2:

We consider a sphere of radius R carrying a charge Q uniformly distributed on its surface with a density σ .

- 1- By applying Gauss's theorem, calculate the electric field at every point in space.
- 2- Deduce the electric potential at every point in space.

Exercise 3:

A sphere with center O and radius R contains a charge uniformly distributed with a volume density ρ (with $\rho = \frac{3Q}{4\pi R^3}$).

- 1- By applying GAUSS's theorem, find the expression of the electric field $E(r)$ at any point in space.
- 2- Deduce the expression of the electric potential $V(r)$ at any point in space.