

VI Finale Test

1. Final test

Course question

1. Define the electrostatic dipole. Represent the dipole moment (draw a diagram).

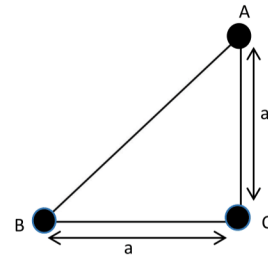
Exercise 01

Consider an isosceles right triangle ABC with equal sides (a) and three charges

$q_A = -q$, $q_B = +q$ and $q_C = +q$ situated at points A, B and C respectively

. We give : $q = 1\mu C$, $a = 1\text{cm}$

1. Represent graphically all the forces exercised by the three charges (without calculating them)
2. Calculate the electric field E and the potential V created by the charges on A
3. Deduce the force exercised on the charge situated at point A
4. Calculate the potential energy of q_A at point A

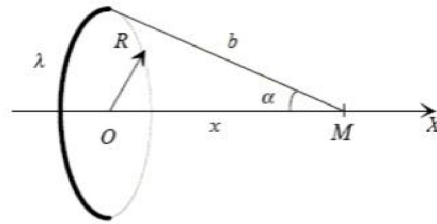


Exercise 02

A linear charge λ is distributed uniformly on a ring-shaped wire³ of radius⁴ R. (figure opposite).

1- Calculate the electric field produced by the wire⁵ at point M located on the axis OX at a distance x from center W.

2- Calculate the electric potential created by ring-shaped wire of radius R



Exercise 03

Consider a spherical cavity⁶ of radius a at the center of a sphere non-conductive, center O and radius A. The rest of the sphere has a volume density of positive charge and uniform ρ

1. Determine the electric field created at any point M(r) in space:

$r < a$, $a < r < R$ and $r > R$.

2. Deduce the electrostatic potential at any point M(r) in space:

$r < a$, $a < r < R$ and $r > R$, knowing that $V(r \rightarrow \infty) = 0$.

the vertices¹ / رؤوس / المعين² / diamond / ring-shaped wire³ / خيط على شكل / نصف القطر⁴ / radius / حلقه⁵ / wire / كرة مجوفة⁶ / spherical cavity

