

Exercises series N°3

Exercise 1:

The electric field \vec{E} is related to the electric potential V by the relation

$\vec{E} = -\overrightarrow{\text{Grad}}V = -\vec{\nabla}V$. If the electric potential is given by: $V = 2xy^2$, calculate \vec{E} .

Exercise 2:

Determine the electric field associated with the potential function

$V(x, y, z) = 4x^2z^3 - 3x^3yz + 2xy$ at the point $P(1,2,3)$

Exercise 3:

Calculate the field created by a wire of infinite length, charged with a linear charge density $+\lambda$, at any point M on an axis perpendicular to the wire and passing through its midpoint.

Exercise 4:

Calculate the field and potential created by a circular disk of radius R uniformly charged with a surface charge density of $+\sigma$, at any point M on an axis perpendicular to the disk and passing through its middle.