

Problem set 03

Problem 1

Use the method of images to find the force between a neutrally charged solid metal sphere of radius R held at a potential V_0 and a point charge q at a distance $a > R$ from the center of the metal sphere. Read carefully about the method of images in Griffiths before attempting a solution.

Problem 2

Long insulating cylinder shell with radius a carries the surface charge $\sigma(a, \phi) = \sigma_0 \sin(4\phi)$.

(a) Find the electrical field and the electrostatic potential everywhere inside and outside the cylinder shell.

(b) Make a graph of the electrostatic potential.

(c) How are the total charge of the cylinder and the asymptotic form of the electrostatic potential far away from it related?

The problems are due Monday February 03 2025 at 20:00