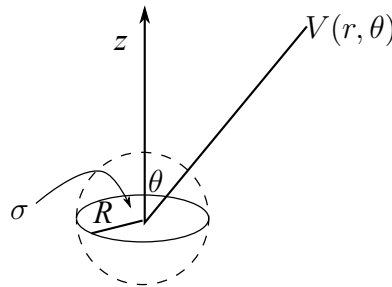


1. A conducting sphere of radius R has an amount of charge Q over it. This sphere is placed in an otherwise uniform electric field \vec{E}_0 . The potential of the sphere is found to be V_0 . Find the potential in the region outside the sphere.
2. A sphere of radius R has a surface charge given by the surface charge density $\sigma = k \cos 3\theta$ where k is a constant. Find the potential inside and outside the sphere.
3. A ring of radius R has a charge Q uniformly spread along it. The ring is placed on the x - y plane with the z -axis coinciding with its axis. Find the potential $V(r, \theta)$ in the region surrounding the ring.



4. Solve Laplace's equation by separation of variables in cylindrical co-ordinates, assuming there is no dependence on z .