

M09E.3 - Charge and Conducting Sphere (J94E.3)

Problem

A point charge Q_1 is located a distance d from the center of a thin, conducting spherical shell of radius R ($d > R$).

- If the conducting sphere were temporarily grounded, what would be the magnitude Q' and distance from the origin d' of the image charge?
- Now the ground connection is removed and the conducting sphere is insulated from the ground, leaving the total net charge Q' distributed on the surface. If an additional amount of charge $\Delta Q = Q - Q'$ is placed on the surface of the conducting sphere, how will the excess charge distribute itself on the surface?
- What must the net charge on this shell Q be so that there is no net force between the point charge Q_1 and the shell?

