# Preparation Assignments

Due Monday, October 7

Determine the total charge in a hollow sphere with inner radius, *a*, outer radius, *b*, and a charge density $\rho(r,\theta,\phi) = \rho_o r$ [C/m³].

Determine the total charge of on a spherical shell located at radius, *r* = *c*, with a surface charge density of $\rho(r,\theta,\phi) = -\rho_o$ [C/m²].

What is the relationship between, *a*, *b*, and, *c* such that the total volume charge is equal and opposite to the total surface charge?

Due Wednesday, October 9
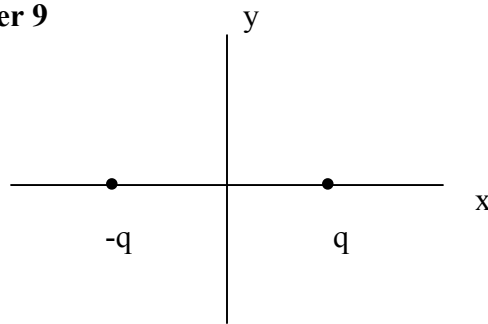
In the above figure, the two charges are located at *x* = -*a* and *x* = *a*.

Using the known electric field pattern for a point charge, determine the electric field on the x-axis and on the y-axis. Use superposition.

Due Thursday, October 10

For the above figure, using the known potential for a point charge, determine the potential (voltage) as a function of position on the x-axis and on the y-axis. Use superposition.

Using the relationship between electric field and potential (voltage), verify your results from Wednesday's prep assignment.