Physics 202 Practice Problems

Gauss’s Law … Part B

1. A spherical object has a uniform volume charge density of 4.50 x 10 – 5 C/m3. The sphere has a radius of 3.60 cm.
2. What is the total electric charge of the sphere?
3. What is the magnitude of the electric field at a distance of 7.40 cm from the sphere’s center?
4. What is the magnitude of the electric field at the sphere’s surface?
5. What is the magnitude of the electric field at a distance of 2.40 cm from the sphere’s center?
6. What is the magnitude of the electric field at a distance of 1.20 cm from the sphere’s center?
7. What is the magnitude of the electric field at the sphere’s center?
8. A spherical object has a non-uniform volume charge density. The sphere has a radius of 3.60 cm. The charge density, as a function of distance from the center (r), is given by:
9. What is the total electric charge of the sphere?
10. What is the electric field (as a function of r) outside of the sphere?
11. What is the electric field (as a function of r) inside of the sphere?