

EE331 / Spring 2007
Homework # 9 (Due 4/9/2007)

Problems:

1. A conducting sphere is embedded in a perfect dielectric medium with permittivity $\epsilon_r = 4$.
The electric field in the dielectric medium is $\vec{E} = 2 \cos \theta \hat{r} - 2 \sin \theta \hat{\theta}$ V/m. If the radius of the sphere $r = 4$ cm, determine the surface charge density on the sphere.
2. Determine the surface charge density on a conducting sphere, if the electric field outside the sphere is given by $\vec{E} = 500 \hat{r}$ V/m. The sphere is centered at the origin and has a 10 cm radius.

Text book :

Chapter 4: Problems 4.53, 4.55, 4.56, 4.58