

PHYS 333 — Problem Set #7

Due before class **Friday**, October 20

1. Griffiths 4.1
2. Griffiths 4.3
3. Griffiths 4.4
4. Griffiths 4.6
5. Griffiths 4.12

Hint: the electric field for a uniformly charged sphere is

$$\mathbf{E} = \frac{Qr}{4\pi\epsilon_0 R^3} \hat{\mathbf{r}} \text{ for } r < R, \quad \mathbf{E} = \frac{Q}{4\pi\epsilon_0 r^2} \hat{\mathbf{r}} \text{ for } r > R$$

where R is the radius of the sphere and Q is the total charge. You don't need this electric field, but you will need to evaluate an integral that is the same the \mathbf{E} calculation for a uniformly charged sphere, so these results can save you doing the integral.

6. Griffiths 4.10
7. Griffiths 4.14
8. Griffiths 4.15
9. Griffiths 4.16