

Homework 2

Physics 313

Fall 2026

Due 12:30 PM, Tuesday, 15 September, 2026 as an upload to ELMS
All problems are from Griffiths *Introduction to Electrodynamics* 5th Edition

- 1) Griffiths Problem 1.47 [3D charge distribution with delta function]
- 2) Griffiths Problem 1.50 [Vector functions represented by potentials]
- 3) Griffiths Problem 1.56 [Check on Stokes' theorem]
- 4) Griffiths Problem 2.5 [Electric field from a ring of charge]
- 5) Griffiths Problem 2.6 [Electric field from a charged disk]
- 6) Griffiths Problem 2.13 [Gauss' Law uniformly charged sphere]
- 7) Griffiths Problem 2.14 [Gauss' Law uniformly charged wire]
- 8) Griffiths Problem 2.16 [Gauss' Law with radial charge density]

Extra Credit:

The time –averaged potential of a neutral hydrogen atom (an electron orbiting a proton) is given by

$$V = \frac{q}{4\pi\epsilon_0} \frac{e^{-\alpha r}}{r} \left(1 + \frac{\alpha r}{2} \right)$$

where q is the magnitude of the electronic charge and $1/\alpha = a_0/2$, a_0 being the Bohr radius. Find the distribution of charge (both continuous and discrete) that will give this potential and interpret your result physically.