

Written Homework Two:

Gauss' Law Example

Due Friday February 9th by 5pm. If you cannot physically turn it in, either in lab or under my office door (SIE 3319) then email an image of your work and return the physical copy the following Monday.

1. A long, thin line of charge $+\lambda$ lies along the x-axis. It is surrounded by a thin cylindrical shell, radius a , with an equal and opposite charge per unit length, $-\lambda$. Find the electric field inside ($r < a$) and outside ($r > a$) the shell.

Side Note: this is a co-axial cable, uniformly charged $+$ and $-$, instead of flowing currents left and right. The utility of the co-axial cable will be fully realized later when we study magnetic fields and Ampere's Law.