

1 Spherical Shell Step Functions

One way to write volume charge densities without using piecewise functions is to use step (Θ) or δ functions. If you need to review this, see the following link in the math-physics book: <https://paradigms.oregonstate.eduhttps://books.physics.oregonstate.edu/GMM/step.html>

Consider a spherical shell with charge density $\rho(\vec{r}) = \alpha 3e^{(kr)^3}$ between the inner radius a and the outer radius b . The charge density is zero everywhere else. Use step functions to write this charge density as a single function valid everywhere in space.