

1. (No hints)

2a) (Follow instructions!)

- Charge density =  $e(n_i - n_e) + q\delta(\vec{r})$ ,  
but  $\delta(\vec{r}) \rightarrow 0$  as  $\vec{r} \neq 0$
- Symmetric in both angles
- For differential eq., use ansatz

$$\delta\Phi(r) = Ar^{-1}e^{Br}$$

- To solve other constant approximate potential at  $r \approx 0$  as that of a simple point charge

b) (No hints)

3. (No hints)