

Simplify, PLEASE

$$\left\{ \begin{aligned} \phi(r) = & \phi_1 + \frac{\rho_0}{\epsilon_0(n+2)(n+3)} \left(a^2 - \frac{r^{n+2}}{a^n} \right) \\ & + \left(\frac{-ab}{a-b} \frac{1}{r} + \frac{b}{b-a} \right) \left[\phi_2 - \phi_1 + \frac{\rho_0}{\epsilon_0 a^n (n+2)(n+3)} (b^{n+2} - a^{n+2}) \right] \end{aligned} \right\}$$

check

at $r=a$

$$\phi(a) = \phi_1 + \frac{\rho_0}{\epsilon_0(n+2)(n+3)} (a^2 - a^2) + \left(-\frac{b}{b-a} + \frac{b}{b-a} \right) [\quad]$$

$$\underline{\phi(a) = \phi_1} \quad \checkmark$$

at $r=b$

$$\begin{aligned} \phi(b) = & \phi_1 + \frac{\rho_0}{\epsilon_0(n+2)(n+3)} \left(a^2 - \frac{b^{n+2}}{a^n} \right) \\ & + \underbrace{\left(\frac{b}{b-a} - \frac{a}{b-a} \right)}_1 \left[\phi_2 - \phi_1 + \frac{\rho_0}{\epsilon_0 a^n (n+2)(n+3)} (b^{n+2} - a^{n+2}) \right] \end{aligned}$$

$$\begin{aligned} = & \phi_1 + \frac{\rho_0}{\epsilon_0(n+2)(n+3)} \left(a^2 - \frac{b^{n+2}}{a^n} \right) \\ & + \phi_2 - \phi_1 + \frac{\rho_0}{\epsilon_0(n+2)(n+3)} \left(\frac{b^{n+2}}{a^n} - a^2 \right) \end{aligned}$$

$$\underline{\phi(b) = \phi_2} \quad !$$