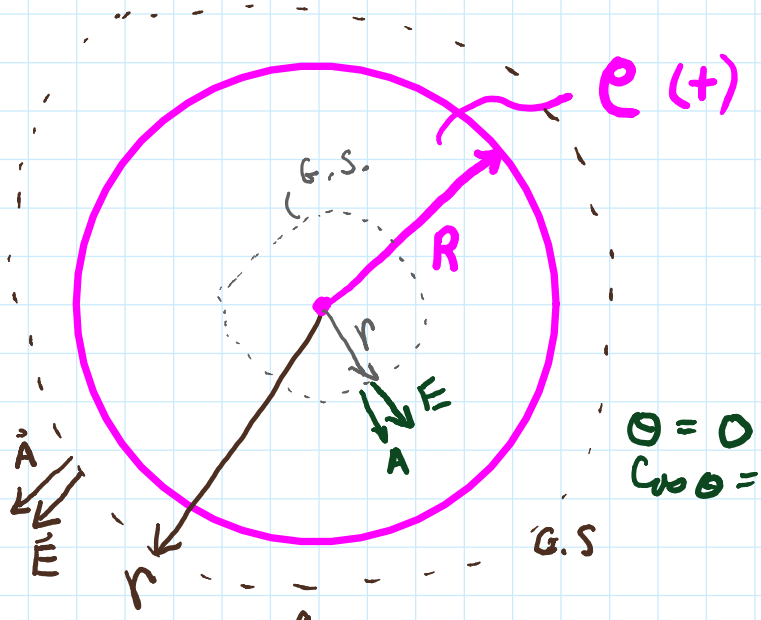
Extra 1

Monday, February 9, 2015 7:46 AM



$\theta = 0$

$\cos\theta = 1$

$$\Phi = \frac{q_{enc}}{\epsilon_0}$$

$$E A_s \cos\theta = \frac{q_{enc}}{\epsilon_0}$$

$$E A_s = \frac{q_{enc}}{\epsilon_0}$$

$$E(4\pi r^2) = \frac{eV}{\epsilon_0}$$

$$E(4\pi r^2) = \frac{e(\frac{4}{3}\pi r^3)}{\epsilon_0}$$

$$E_{in} = \frac{er}{3\epsilon_0}$$

$$E_{in} \propto r$$

$$\Phi = \frac{q_{enc}}{\epsilon_0}$$

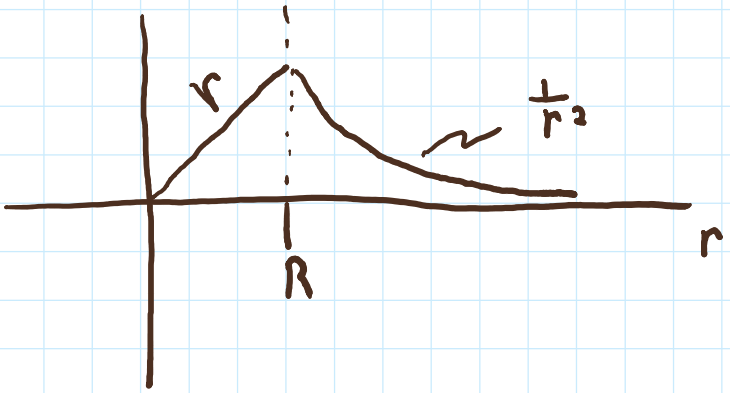
$$E A_s = \frac{q_{enc}}{\epsilon_0}$$

$$E(4\pi r^2) = \frac{eV}{\epsilon_0}$$

$$E(4\pi r^2) = \frac{e(\frac{4}{3}\pi R^3)}{\epsilon_0}$$

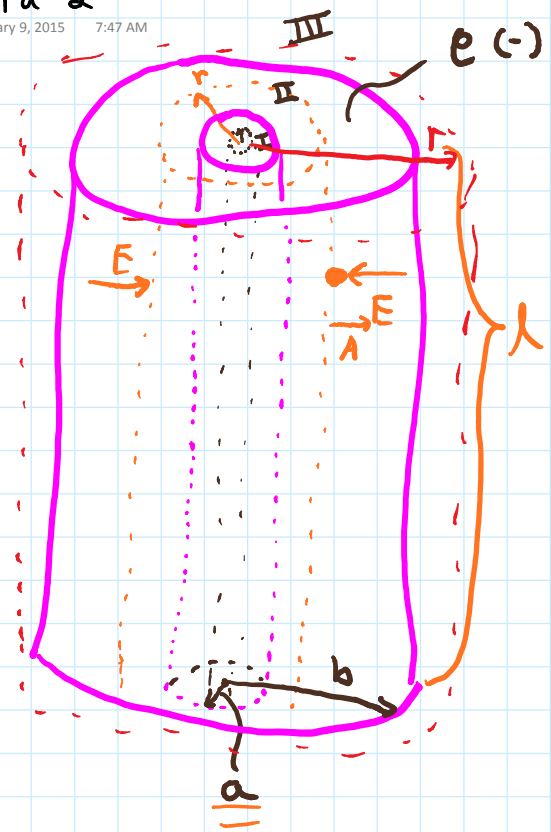
$$E_{out} = \frac{eR^3}{3r^2\epsilon_0}$$

$$E_{out} \propto \frac{1}{r^2}$$



Extra 2

Monday, February 9, 2015 7:47 AM



(I) $\Phi = \frac{q_{enc}}{\epsilon_0}$

$\Phi = 0$

$E = 0$

(II) $\Phi = \frac{q_{enc}}{\epsilon_0}$

$E A_s \cos(180)$

$-E A_s = \frac{q_{enc}}{\epsilon_0}$

$-E(2\pi r \ell) = \frac{e[\pi r^2 \ell - \pi a^2 \ell]}{\epsilon_0}$

$E = \frac{-e[r^2 - a^2]}{2 r \epsilon_0}$

(III) $\Phi = \frac{q_{enc}}{\epsilon_0}$

$-E(2\pi r \ell) = \frac{e[\pi b^2 \ell - \pi a^2 \ell]}{\epsilon_0}$

$E = \frac{-e[b^2 - a^2]}{2 r \epsilon_0}$