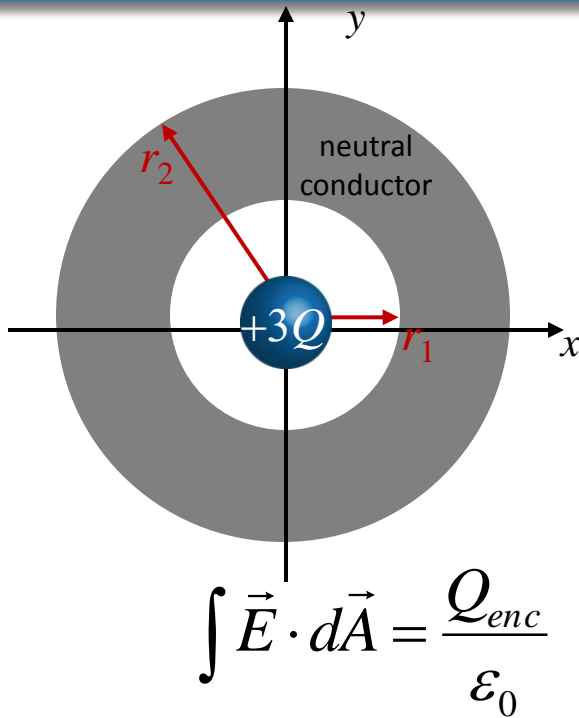


Calculation



Point charge $+3Q$ at center of neutral conducting shell of inner radius r_1 and outer radius r_2 .

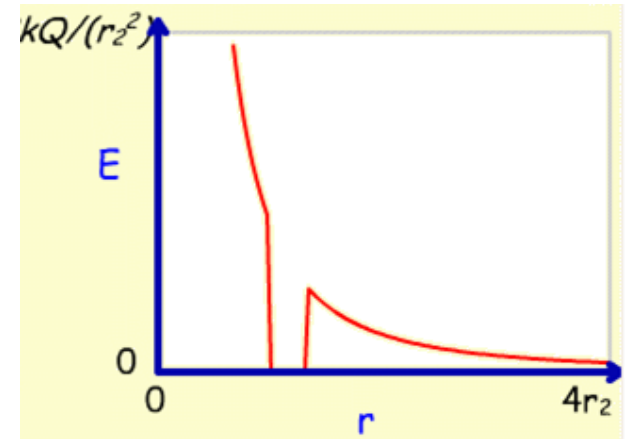
A) What is E everywhere?

We know:

$$r < r_1 \quad E = \frac{1}{4\pi\epsilon_0} \frac{3Q}{r^2}$$

$$r > r_2$$

$$r_1 < r < r_2 \quad E = 0$$

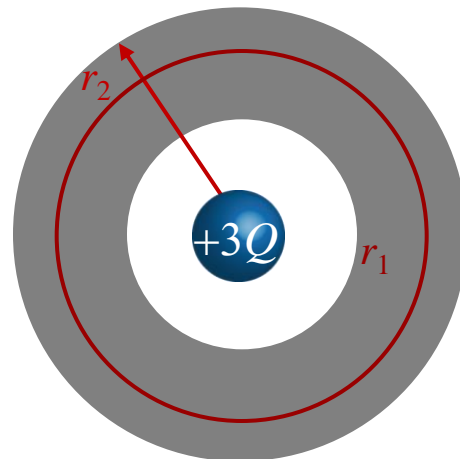


B) What is charge distribution at r_1 ?

A) $\sigma < 0$

B) $\sigma = 0$

C) $\sigma > 0$



Gauss' Law:

$$E = 0 \rightarrow Q_{enc} = 0 \rightarrow \sigma_1 = \frac{-3Q}{4\pi r_1^2}$$

Similarly:

$$\sigma_2 = \frac{+3Q}{4\pi r_2^2}$$