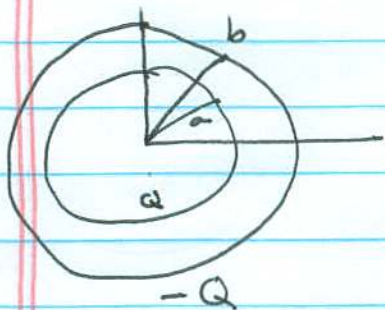


3-16

for  $a < r < b$ 

$$\oint \vec{E} \cdot d\vec{A} = \frac{Q_{\text{enclosed}}}{\epsilon_0} = \frac{+Q}{\epsilon_0}$$

$$E_r \cdot 4\pi r^2 = \frac{Q}{\epsilon_0}$$

$$\vec{E} = \frac{Q}{4\pi\epsilon_0 r^2} \hat{r}$$

IF  $Q_{\text{outer}} \rightarrow \emptyset$ ,  $\vec{E}(a < r < b)$  is unchanged  
 but  $\vec{E}(r > b)$  changes.