



$$\mathbf{E} 4\pi r^2 = Q_{\text{in}} / \epsilon_0$$

$$\mathbf{E}_1 4\pi r_1^2 = Q / \epsilon_0$$

$$\mathbf{E}_1 = \frac{Q}{4\pi\epsilon_0 r_1^2}$$

$$\mathbf{E}_2 = 0$$

$$\mathbf{E}_2 4\pi r_2^2 = 0$$

$$\mathbf{E}_3 4\pi r_3^2 = \frac{Q}{\epsilon_0}$$

$$\mathbf{E}_3 = \frac{Q}{4\pi\epsilon_0 r_3^2}$$



