

$$Q_{(r)} = \rho \cdot V_{(r)}$$

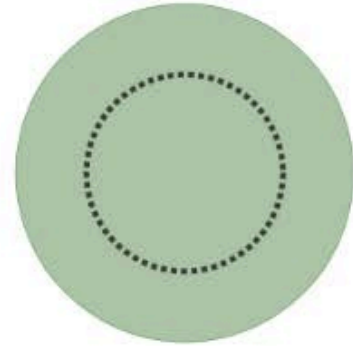
$$Q_{(r)} = \frac{Q}{R^3} \cdot r^3 = Q \cdot \left(\frac{r}{R}\right)^3$$

$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2} = \frac{Q \cdot \left(\frac{r}{R}\right)^3}{r^2} = \frac{Q}{R^3} \cdot r$$

$$\vec{E}_{(r)\hat{r}}$$

A $\frac{Q}{R^3} \cdot r$

B $\frac{Q}{r^2}$



$$V = \frac{4}{3}\pi r^3$$

$$\rho_{(r)} = \frac{Q}{V}$$

$$V = r^3$$

$$\rho = \frac{Q}{R^3}$$

$$Q_{(r)} = \rho \cdot V_{(r)}$$

$$Q_{(r)} = \frac{Q}{R^3} \cdot r^3 = Q \cdot \left(\frac{r}{R}\right)^3$$

$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2} = \frac{Q \cdot \left(\frac{r}{R}\right)^3}{r^2} = \frac{Q}{R^3} \cdot r$$

A $\vec{E}_{(r)\hat{r}}$
 $\frac{Q}{R^3} \cdot r$

B $\frac{Q}{r^2}$

$$Q_{(r)} = \int_0^r \rho_{(r)} \cdot dV = \int_0^r \rho_{(r)} \cdot r^2 \cdot dr$$

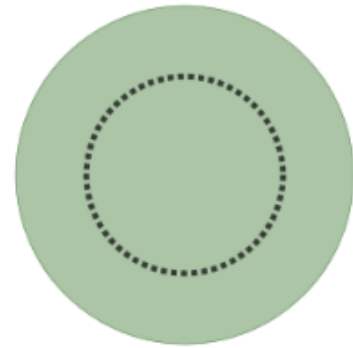
$$Q_{(r)} = \int_0^r \frac{Q_0}{r} \cdot r^2 \cdot dr = Q_0 \int_0^r r \cdot dr = Q_0 \cdot r^2$$

$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2} = \frac{Q_0 \cdot r^2}{r^2} = Q_0$$

$$Q_{(r=R)} = Q_0 \cdot R^3$$

A $\vec{E}_{(r)\hat{r}}$
 Q_0

B $Q_0 \cdot R^2$
 ~~r^2~~



$$V = \frac{4}{3} \pi r^3 \quad \rho_{(r)} = \frac{Q}{V}$$

$$V = r^3 \quad \rho = \frac{Q}{R^3}$$

$$\rho_{(r)} = \frac{Q_0}{r}$$

$$Q_{(r)} = \rho \cdot V_{(r)}$$

$$Q_{(r)} = \frac{Q}{R^3} \cdot r^3 = Q \cdot \left(\frac{r}{R}\right)^3$$

$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2} = \frac{Q \cdot \left(\frac{r}{R}\right)^3}{r^2} = \frac{Q}{R^3} \cdot r$$

A $\vec{E}_{(r)\hat{r}}$

$$\frac{Q_2}{R^3} \cdot r + \frac{Q_1}{r^2}$$

B $\frac{Q_2}{r^2} + \frac{Q_1}{r^2} + \frac{Q_3}{r^2}$

$$Q_{(r)} = \int_0^r \rho_{(r)} \cdot dV = \int_0^r \rho_{(r)} \cdot r^2 \cdot dr$$

$$Q_{(r)} = \int_0^r \frac{Q_0}{r} \cdot r^2 \cdot dr = Q_0 \int_0^r r \cdot dr = Q_0 \cdot r^2$$

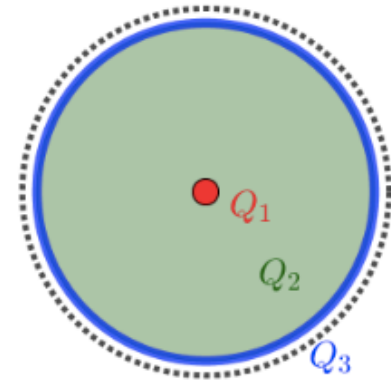
$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2} = \frac{Q_0 \cdot r^2}{r^2} = Q_0$$

$$Q_{(r=R)} = Q_0 \cdot R^3$$

A $\vec{E}_{(r)\hat{r}}$

$$Q_0$$

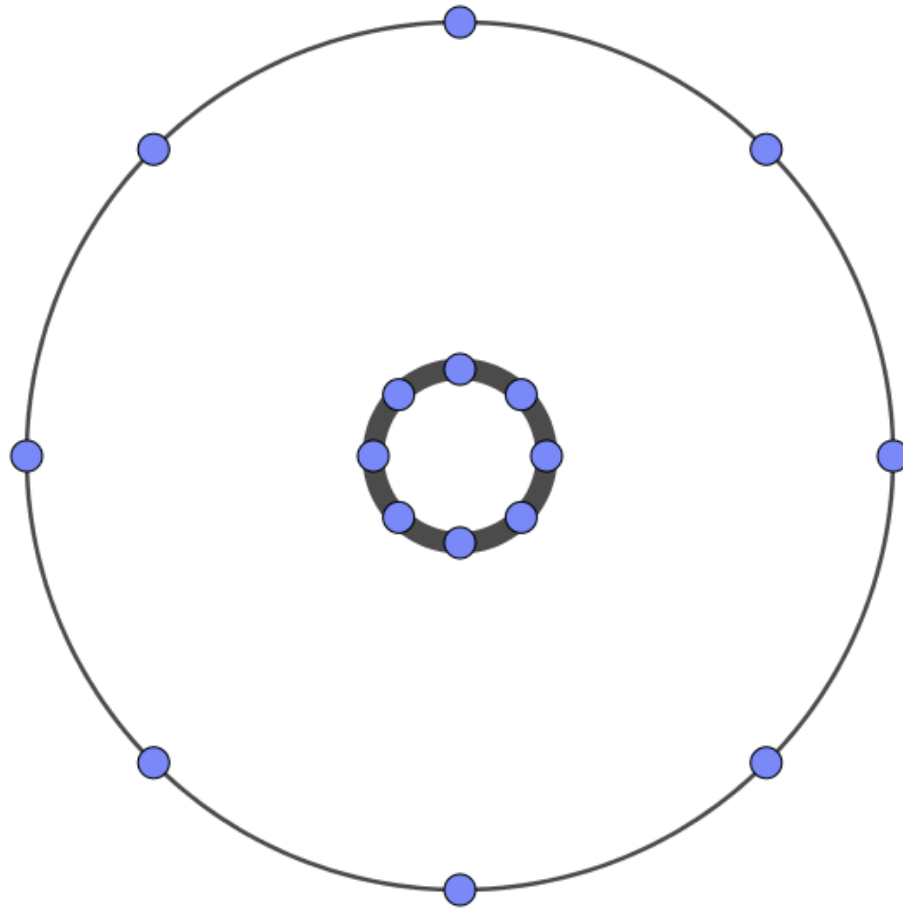
B $Q_0 \cdot R^2$



$$V = \frac{4}{3} \pi r^3 \quad \rho_{(r)} = \frac{Q}{V}$$

$$V = r^3 \quad \rho = \frac{Q}{R^3}$$

$$\rho_{(r)} = \frac{Q_0}{r}$$



$$\sigma \cdot R^2 = Q_{tot}$$

$$\Delta \vec{E} = \frac{Q}{r^2} = \frac{Q}{R^2}$$

$$\Delta \vec{E} = \sigma$$

$$\vec{E}_{(r)} = \frac{1}{r^2} \int_0^r r^2 \cdot \rho_{(r)} \cdot dr$$

$$r^2 \cdot \vec{E}_{(r)} = \int_0^r r^2 \cdot \rho_{(r)} \cdot dr$$

$$\frac{d(r^2 \cdot \vec{E}_{(r)})}{dr} = r^2 \cdot \rho_{(r)}$$

$$\frac{1}{r^2} \frac{d(r^2 \cdot \vec{E}_{(r)})}{dr} = \rho_{(r)}$$

$$\rho_{(r)} = \frac{1}{r^2} \frac{d(r^2 \cdot \vec{E}_{(r)})}{dr} \quad \rho_{(r)} = \nabla \cdot \vec{E}_{(r)}$$

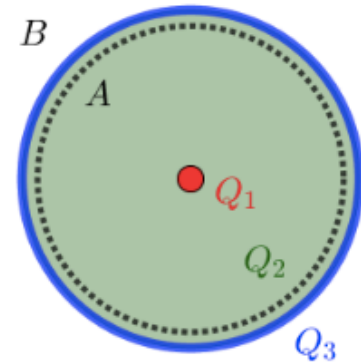
$$Q_{(r)} = \int_0^r \rho_{(r)} \cdot dV = \int_0^r \rho_{(r)} \cdot r^2 \cdot dr$$

$$\vec{E}_{(r)} = \frac{Q_{(r)}}{r^2}$$

$$\vec{E}_{(r)\hat{r}}$$

$$A \quad Q_0 \quad + \frac{Q_1}{r^2}$$

$$B \quad \frac{Q_0 \cdot R^2}{r^2} + \frac{Q_1}{r^2} + \frac{Q_3}{r^2}$$



$$\rho_{(r)} = \frac{Q_0}{r}$$

$$\vec{E}(r) = \frac{1}{r^2} \int_0^r r^2 \cdot \rho(r) \cdot dr$$

$$r^2 \cdot \vec{E}(r) = \int_0^r r^2 \cdot \rho(r) \cdot dr$$

$$\frac{d(r^2 \cdot \vec{E}(r))}{dr} = r^2 \cdot \rho(r)$$

$$\frac{1}{r^2} \frac{d(r^2 \cdot \vec{E}(r))}{dr} = \rho(r)$$

$$\rho(r) = \frac{1}{r^2} \frac{d(r^2 \cdot \vec{E}(r))}{dr} \quad \rho(r) = \nabla \cdot \vec{E}(r)$$

$$\rho(r) = \frac{1}{r^2} \frac{d(r^2 \cdot Q_0)}{dr}$$

$$\rho(r) = \frac{Q_0}{r^2} \frac{d(r^2)}{dr} = \frac{Q_0}{r^2} \frac{d(r^2)}{dr} = \frac{Q_0}{r^2} 2r$$

$$\rho(r) = \frac{Q_0}{r}$$

$$Q(r) = \int_0^r \rho(r) \cdot dV = \int_0^r \rho(r) \cdot r^2 \cdot dr$$

$$Q(r) = \int_0^r \frac{Q_0}{r} \cdot r^2 \cdot dr = Q_0 \int_0^r r \cdot dr = Q_0 \cdot r^2$$

$$\vec{E}(r) = \frac{Q(r)}{r^2}$$

$$Q_{(r=R)} = Q_0 \cdot R^2$$

$$\vec{E}_{(r)\hat{r}}$$

A $Q_0 + \frac{Q_1}{r^2}$

B $\frac{Q_0 \cdot R^2}{r^2} + \frac{Q_1}{r^2} + \frac{Q_3}{r^2}$

$$\rho(r) = \frac{Q_0}{r}$$

