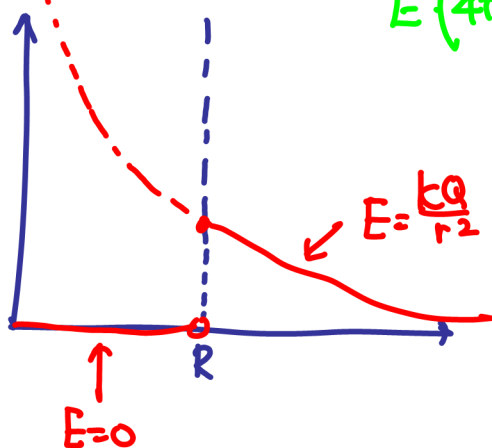


charged spherical shell
total charge $+Q$.

1. What is the electric field inside the sphere?
2. What is the electric field outside the sphere?

1. $\oint \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\epsilon_0} = 0$
 $\vec{E} = 0$.

2. $\oint \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\epsilon_0} = \frac{Q}{\epsilon_0}$
 $E(4\pi r^2) = \frac{Q}{\epsilon_0} \rightarrow E = \frac{Q}{4\pi\epsilon_0 r^2} = \frac{kQ}{r^2}$



DOES GAUSS' LAW HAVE AN EQUIVALENT FOR GRAVITY?

Answer: YES!!!!

no one ever writes it this way!
Just for illustration!

electricity

$$\oint \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\epsilon_0} = 4\pi k Q_{enc}$$

$k = \frac{1}{4\pi\epsilon_0}$
 $\frac{1}{\epsilon_0} = 4\pi k$

Gravity inward.

$$\oint \vec{g} \cdot d\vec{A} = -4\pi G M_{enc}$$

Gauss's law for gravity.