

38. We interpret the question as referring to the field *just* outside the sphere (that is, at locations roughly equal to the radius r of the sphere). Since the area of a sphere is $A = 4\pi r^2$ and the surface charge density is $\sigma = q/A$ (where we assume q is positive for brevity), then

$$E = \frac{\sigma}{\varepsilon_0} = \frac{1}{\varepsilon_0} \left(\frac{q}{4\pi r^2} \right) = \frac{1}{4\pi\varepsilon_0} \frac{q}{r^2}$$

which we recognize as the field of a point charge (see Eq. 23-3).