Exercise 1

Calculate the solid angle subtended by an octant of a sphere at the centre of the sphere.

(Ans. $\pi/2$)

The flux per unit solid angle is known as the **intensity** .

Exercise 3

Find the electric field both inside and outside a spherical shell of radius carrying a uniform charge .

Exercise 4

Find the electric field in the region between two infinite parallel planes carrying charge densities $+\sigma$ and $-\sigma$.

Exercise 5

Find the electric field both inside and outside a spherical shell of radius R carrying a uniform charge Q.

Exercise 6

Find the electric field both inside and outside a long cylinder of radius R carrying a uniform volume charge density ρ.

(Hint : Take the gaussian surface to be a finite concentric cylinder of radius r (with $r < R$ and $r > R$), as shown)

Exercise 7

A very long cylinder carries a charge density $\rho = kr$, where r is the distance from the axis of the cylinder. Find the electric field at a distance $r < R$.

(Ans. $(1/3\epsilon_0)kr^2\hat{r}$)

Exercise 8

A charge Q is located at the center of a cube of side a. Find the flux through any of the sides.

(Ans. $Q/6\epsilon_0$)