7 A metal sphere of radius R is isolated in space.

Point P is a distance x from the centre of the sphere, as illustrated in Fig. 7.1.

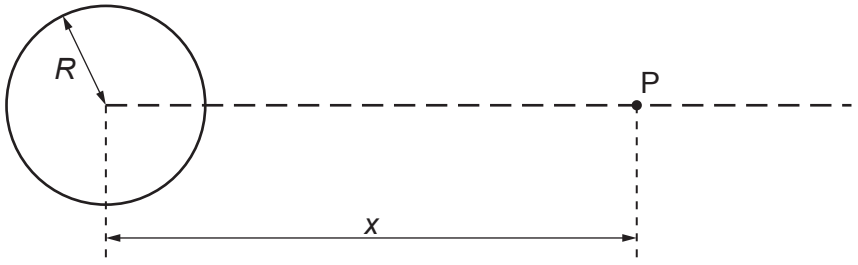

Fig. 7.1

The variation with distance x of the electric field strength E due to the charge on the sphere is shown in Fig. 7.2.

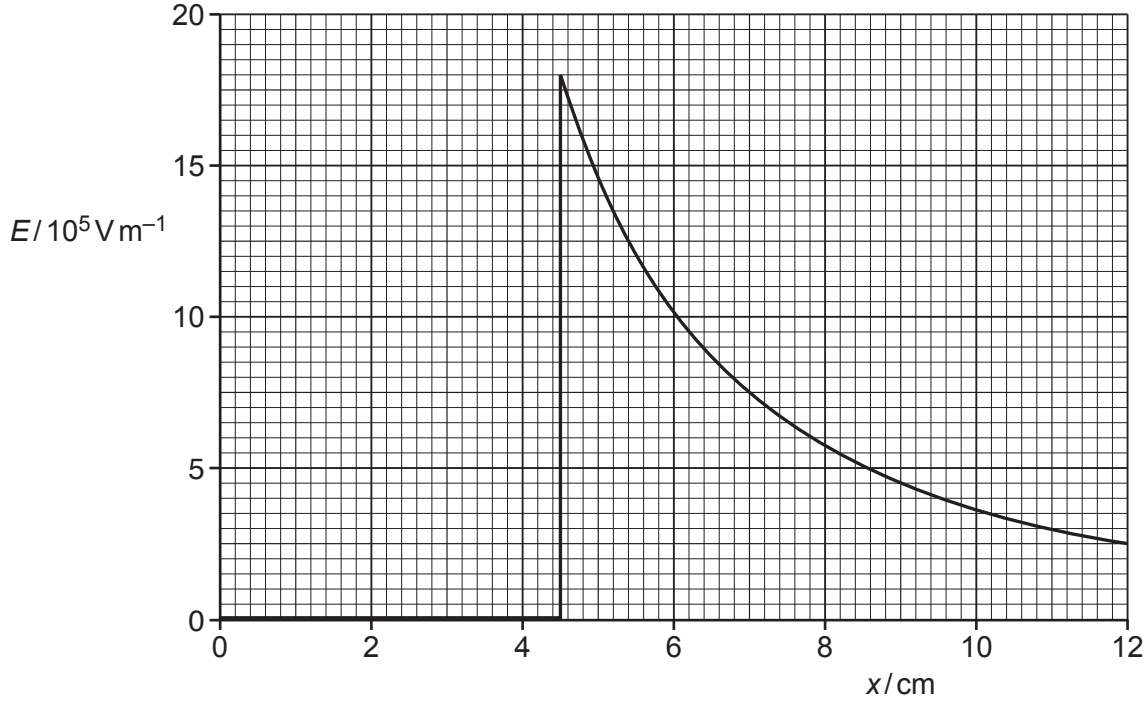

Fig. 7.2

(a) State what is meant by *electric field strength*.

.....

.....

..... [2]

(b) **(i)** Use Fig. 7.2 to determine the radius R of the sphere. Explain your working.

R = ... cm [2]

(ii) Use Fig. 7.2 to determine the charge Q on the sphere.

Q = ... C [3]

(c) An α-particle is situated a distance 8.0 cm from the centre of the sphere.

Calculate the acceleration of the α-particle.

acceleration = ... $m\,s^{-2}$ [3]

[Total: 10]