

A level Physics B

H557/01 Fundamentals of physics

Question Set 15

1. (a)

Fig.1 shows the electric field pattern near two protons and **Fig.2** the electric field pattern near a proton and an electron.

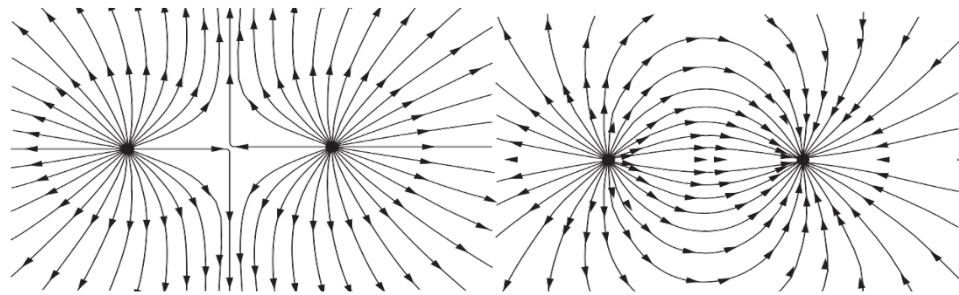


Fig. 1

Fig. 2

On the appropriate figure(s) mark a point **•N** where the electric field is zero and a point **•V** where the electric potential is zero.

(b)

On each of **Fig.1** and **Fig.2** draw **three** complete equipotential lines.

[2]

(c)

Fig. 2 can also represent two spherical charge distributions of +1 C and -1 C situated 1 km apart.

Calculate the electric field midway between the charge centres, at 500 m from each.

[2]

electric field =V m⁻¹ [2]

- (d)* **Fig. 3** shows the electrical potential V and the magnitude of the electric field E against distance R for an isolated -1 C charge.

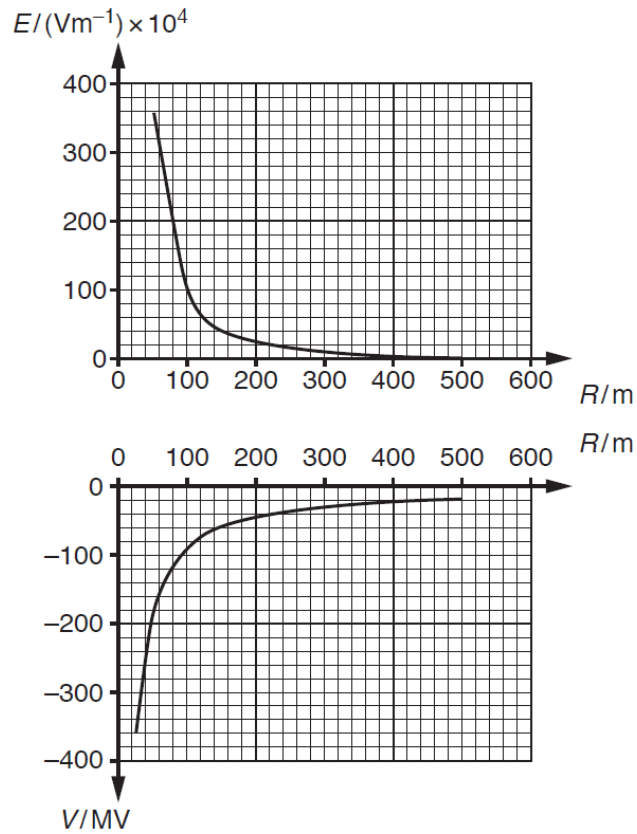


Fig. 3

By considering a unit positive charge being moved from $R = 100\text{ m}$ to 300 m explain the relationship between the electric field and the electric potential.

You may annotate the graphs in **Fig.3** if it is helpful.

[6]

Total Marks for Question Set: 12

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