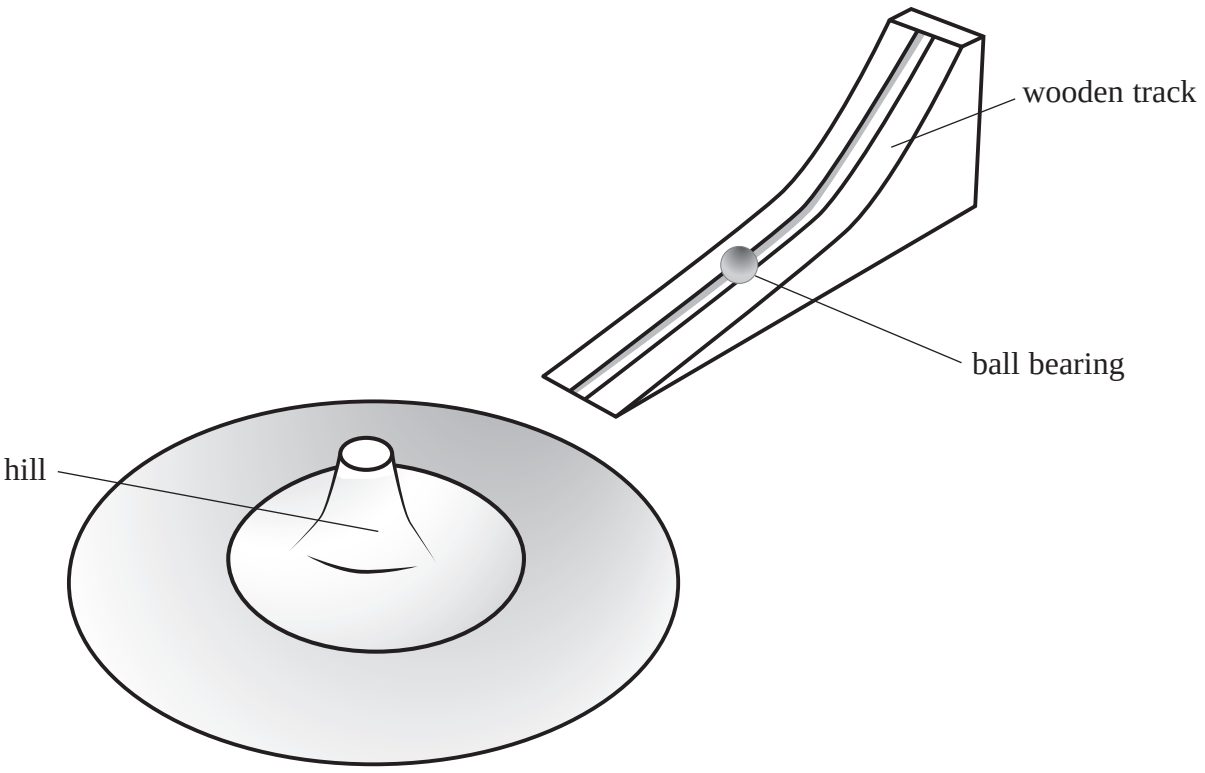
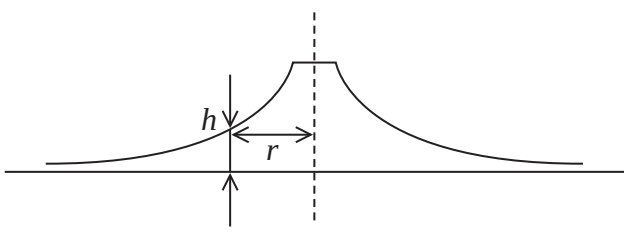
14 The diagram shows a model used to demonstrate alpha particle scattering. A ball bearing is set rolling on a wooden track. The track is positioned so that the ball bearing rolls onto a metal sheet with a curved surface known as a 'hill'.



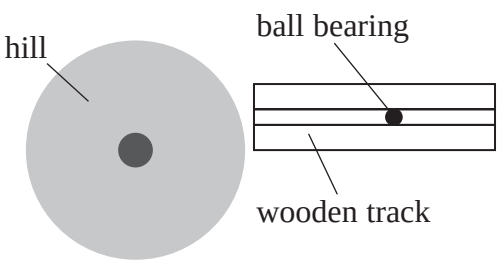
The diagram shows a vertical cross-section through the hill. The surface is curved so that the height of a point h on the curved surface is inversely proportional to the distance r from the centre of the hill.



(a) Explain why the hill is suitable as a model for the electric field surrounding the nucleus of an atom.

(3)

(b) A plan view of the arrangement is shown.



The wooden track is moved to different positions and the ball bearing is released.

Describe the results of the alpha particle scattering experiment and how these can be demonstrated by moving the wooden track to different positions.

(4)

(Total for Question 14 = 7 marks)