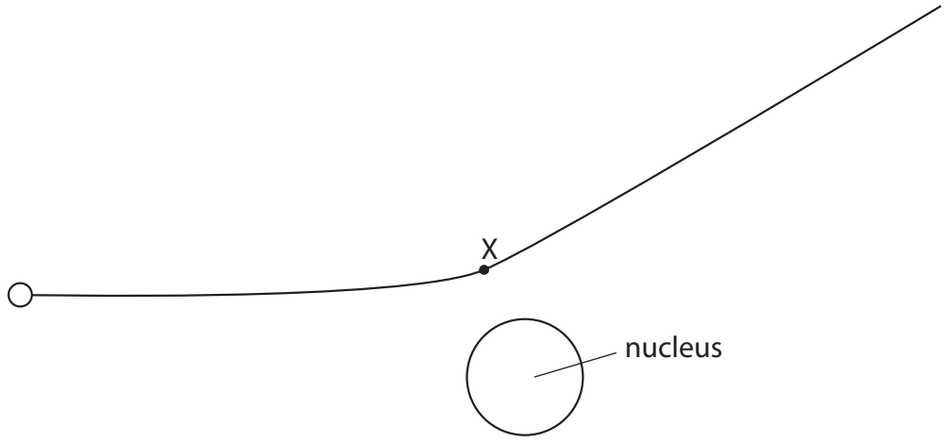
4 This is a question about alpha particles.

(a) Describe the nature of an alpha particle.

(1)

(b) The diagram shows the path of an alpha particle as it passes close to a nucleus.



(i) Draw an arrow from point X to show the force on the alpha particle due to the nucleus.

Label this force Y.

(2)

(ii) Draw an arrow to show the force on the nucleus due to the alpha particle.

Label this force Z.

(2)

(iii) Explain how the path of the alpha particle shows whether the nucleus is positive, negative or neutral.

(3)

(c) The alpha particle experiences a resultant force of 3.6 N and has a mass of 6.6×10^{-27} kg.

Calculate the acceleration of the alpha particle.

(3)

acceleration = ... m/s^2

(Total for Question 4 = 11 marks)