9 The diagram shows a toy caterpillar consisting of a head and three body sections each connected by a light inextensible ribbon. The head has a mass of 120 g and the body sections each have a mass of 90 g.

The toy is pulled on level ground using a horizontal string attached to the head. The tension in the string is 12 N. There are resistances to motion of 2.5 N for the head and each section of the body.

Body sections   Head

(a) (i) State the equation of motion for the toy caterpillar modelled as a single particle. [2]

(ii) Calculate the acceleration of the toy caterpillar. [1]

(b) Draw a diagram showing all the forces acting on the head of the toy caterpillar. [3]

(c) Calculate the tension in the ribbon that joins the head to the body. [2]