**Question 19** (8 marks)
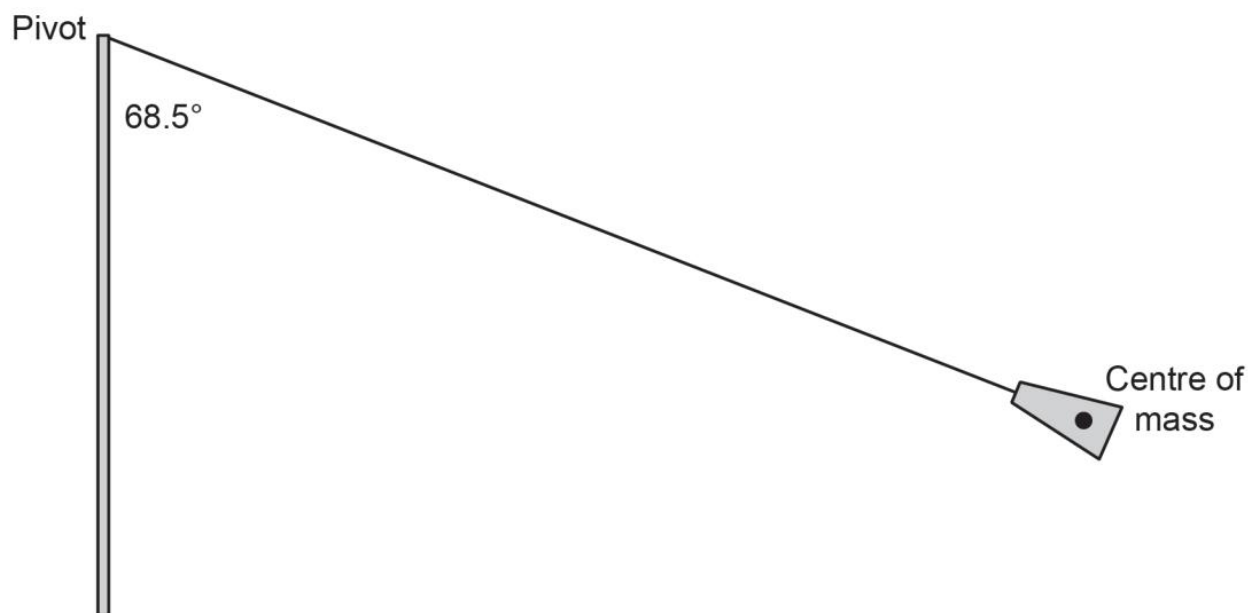
A student is conducting an experiment by tying a rubber stopper to a string and swinging it in a horizontal circle as shown in the diagram below. The stopper has a mass of 0.123 kg and the distance along the string from the pivot to the centre of mass of the stopper is 1.43 m.



(a) On the diagram, draw and label the forces acting on the stopper. (2 marks)

(b) Show that the tension in the string is 3.29 N. (2 marks)

(c) Calculate the speed of the stopper. (4 marks)