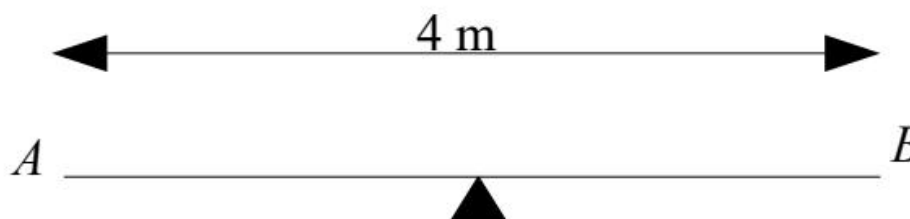


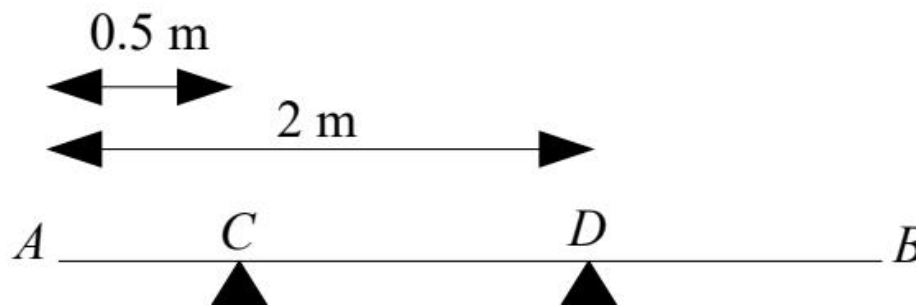
- 1 A seesaw AB of length 4 m is supported by a pivot at its centre. Child C of mass 30 kg sits on the end at A . Child D of mass 45 kg sits x m from the centre of the seesaw and the seesaw rests horizontally in equilibrium. The seesaw is modelled as a uniform rod.



Find the value of x .

(Total for question 1 is 3 marks)

- 2 A uniform rod AB has length 3 m and mass 4 kg. The rod rests horizontally on two supports C and D , where $AC = 0.5$ m and $AD = 2$ m.



- (a) Find the magnitude of the reactions of the support at C and D .

(3)

- (b) A block is now placed at B and the rod is on the point of tilting about D . Find the weight of the block.

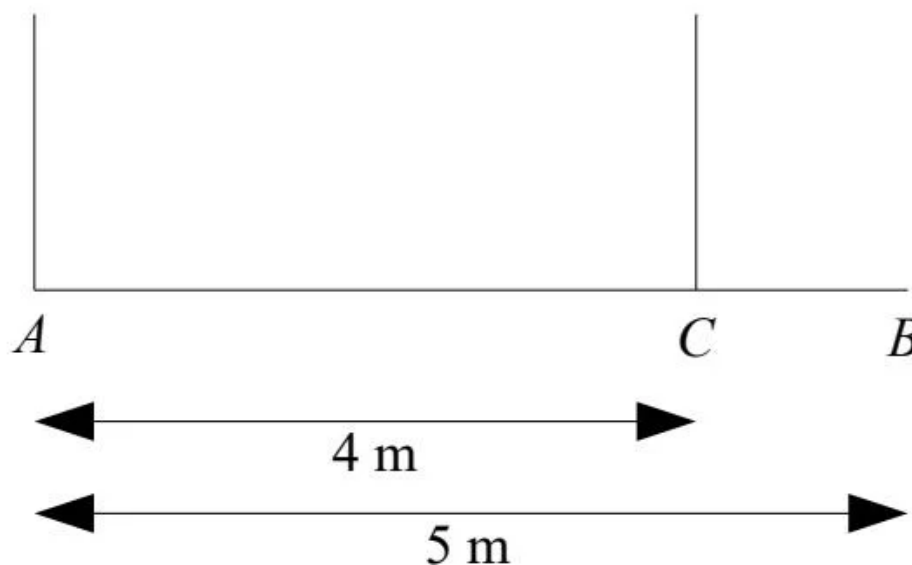
(3)

(c) Find the magnitude of the reaction at D .

(2)

(Total for question 2 is 8 marks)

- 3 A non uniform rod AB has length 5 m and mass 12 kg. The rod is supported by two light inextensible strings attached at A and C , where $AC = 4$ m.



- (a) Given that the tension in the string at A is twice the tension in the string at C , find the tension in the string at C .

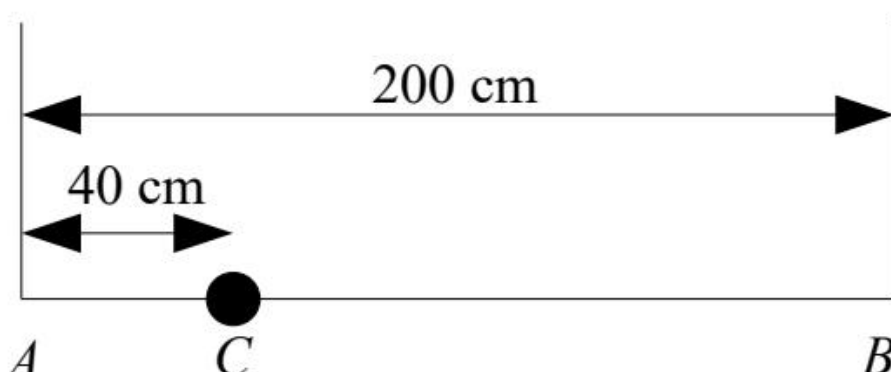
(2)

(b) Find the distance of the rod's centre of mass from A .

(4)

(Total for question 3 is 6 marks)

- 4 A non uniform rod AB has length 200 cm and mass 15 kg. A mass of 10 kg is placed on the rod at C , where $AC = 40$ cm. The rod is held in horizontal equilibrium by two light inextensible strings attached at A and B .



Given that the tension in the string at A is 10 N greater than the tension in the string at B , find the distance, to the nearest cm, of the rod's centre of mass from A .

(Total for question 4 is 6 marks)