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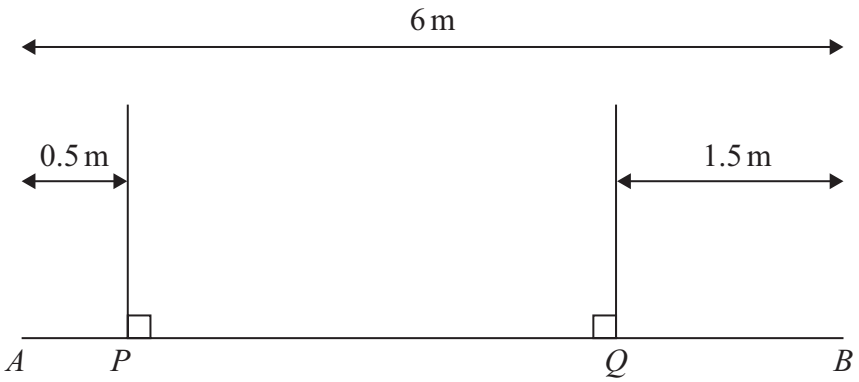


Figure 1

A non-uniform rod AB has mass 20 kg and length 6 m. The rod is held in equilibrium in a horizontal position by two light vertical strings. One string is attached to the rod at P, where $AP = 0.5$ m and the other is attached to the rod at Q, where $QB = 1.5$ m, as shown in Figure 1.

The centre of mass of the rod is 4 m from A.

(a) Find the tension in the string attached to the rod at Q.

(3)

A particle is now attached to the rod at B.

The rod remains in equilibrium in a horizontal position but is on the point of tilting.

The tension in the string attached to the rod at Q is now X newtons.

(b) Find the value of X.

(3)

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Question 2 continued

(Total for Question 2 is 6 marks)