

- 2 Two planks of wood AB and BC are inclined at an angle of 15° to the horizontal. The two wooden planks are joined at point B, as shown in Fig. 2.1.

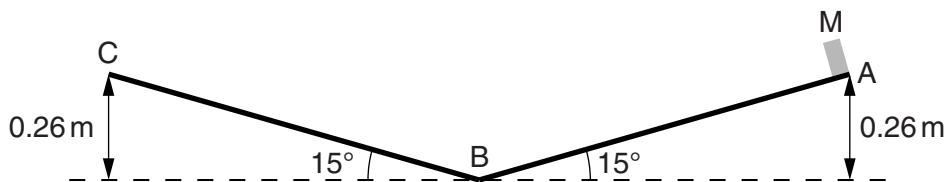


Fig. 2.1

A small block of metal M is released from rest at point A. It slides down the slope to B and up the opposite side to C. Points A and C are 0.26 m above B. Assume frictional forces are negligible.

- (a) (i) Describe and explain the acceleration of M as it travels from A to B and from B to C.

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 [3]

- (ii) Calculate the time taken for M to travel from A to B.

$$\text{time} = \dots \text{ s} [3]$$

- (iii) Calculate the speed of M at B.

$$\text{speed} = \dots \text{ ms}^{-1} [2]$$

- (b) The plank BC is adjusted so that the angle it makes with the horizontal is 30° . M is released from rest at point A and slides down the slope to B. It then slides a distance along the plank from B towards C.

Use the law of conservation of energy to calculate this distance. Explain your working.

$$\text{distance} = \dots \text{ m} [2]$$