2

Fig. 2.1 shows a block of mass M_1 = 4.0 kg released from a vertical height of 6.0 m on a curved frictionless track. It slides down the track and makes a head-on elastic collision with a block of mass M_2 = 9.0 kg that is initially at rest.

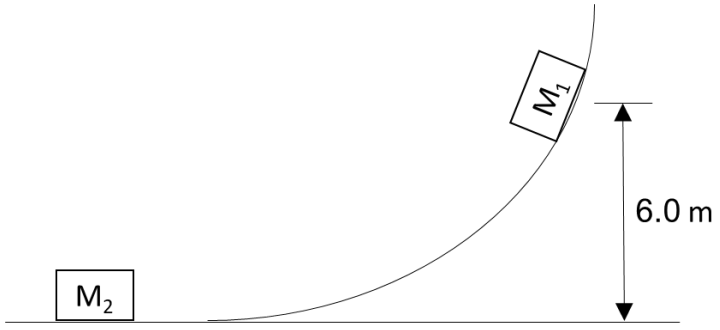

Fig. 2.1

(a)

State the principle of conservation of linear momentum.

……..

……

[1]

(b)

Calculate the velocity of M_1 just after it collides with M_2.

velocity of M_1 just after collision = …..…….. m s^{-1}

[4]

(c)

Calculate the maximum height to which M_1 rises after the collision.

maximum height M_1 rises after collision = …..……. m

[2]

(d)

Sketch a graph, on the given axes in Fig. 2.2, to show how the velocity of M_1 varies from the time of its release to the time it reaches maximum height on its return.

[3]

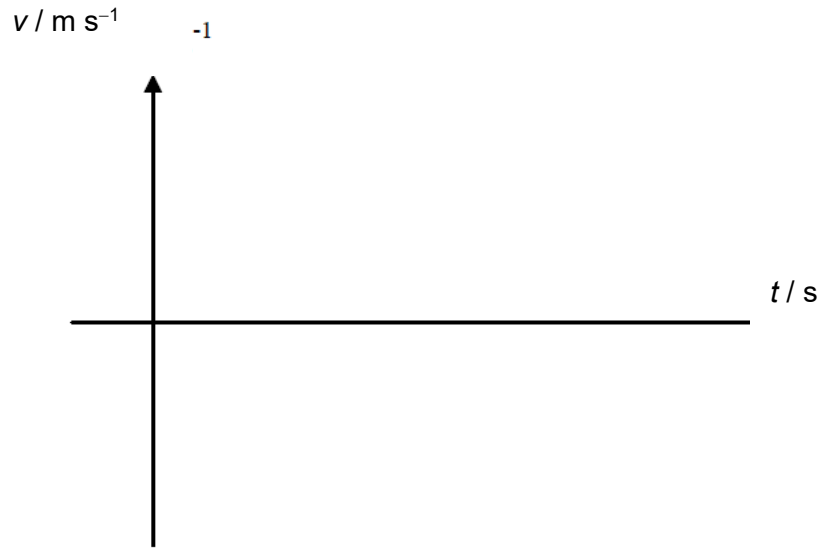

Fig. 2.2