1 Object A of mass m is projected with a velocity of 2.4 m s^{-1} on a frictionless surface, directly towards a stationary object B of mass $4m$, as shown in Fig. 1.1.

A spring of negligible mass is fixed on object B such that the collision with object A is elastic and head-on.

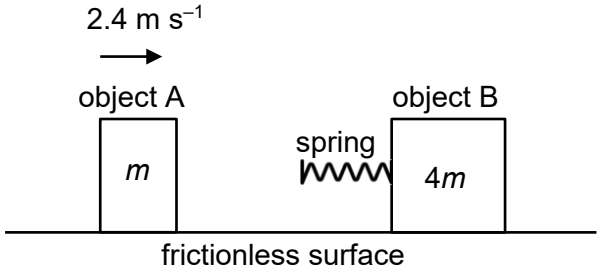

Fig. 1.1

(a) Explain what is meant by an *elastic collision*.

……

…… [1]

(b) Calculate the speed of object A after collision.

speed of object A = …….. m s^{-1} [3]

(c) At one instant during the collision, the two particles have a common speed v_o.

Show that v_o is 0.48 m s^{-1}.

[1]

(d) On the axes in Fig. 1.2, sketch two graphs to show the variation with time t of the velocities v of object A and object B. Label the graphs A and B respectively.

Numerical labels are not required.

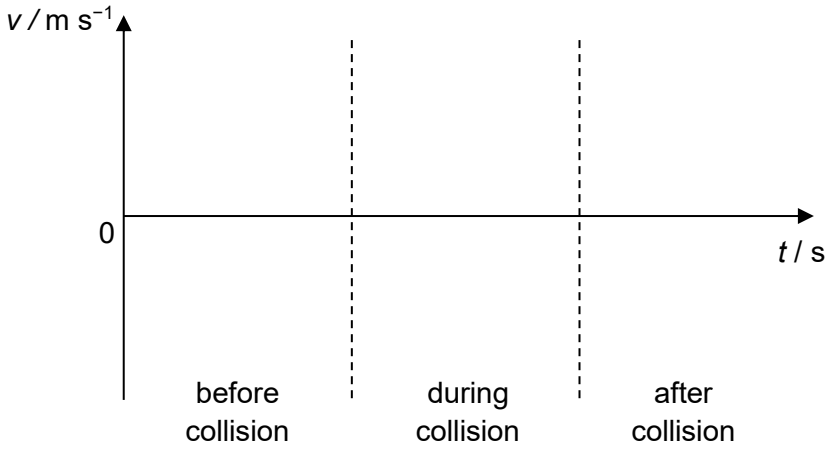

Fig. 1.2

[3]