

- 4 (a) State the principle of conservation of momentum.

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.....  
..... [2]

- (b) An object A of mass 4.0 kg travels at a velocity of  $6.0 \text{ ms}^{-1}$  to the right on a horizontal frictionless surface. It moves towards a second object B of mass 2.0 kg that is moving at a velocity of  $3.0 \text{ ms}^{-1}$  in the same direction as A, as shown in Fig. 4.1.

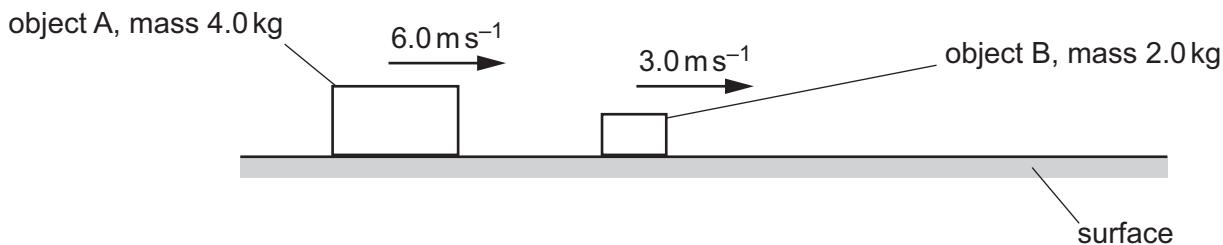


Fig. 4.1

Object A collides with object B. The two objects join and move off together with velocity  $v$ .

Calculate:

- (i) velocity  $v$

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

- (ii) the percentage of the total initial kinetic energy of the two objects that is transferred to other forms of energy during the collision.

$$\text{percentage} = \dots \% \quad [2]$$