

# Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

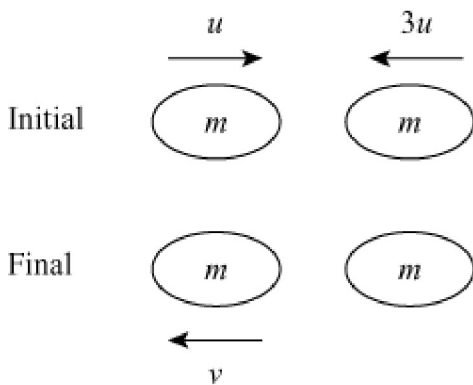
## 8 Momentum

### Exercise A, Question 9

#### Question:

Two identical uniform smooth spheres,  $A$  and  $B$ , each of mass  $m$ , moving in opposite directions with speeds  $u$  and  $3u$ , respectively, collide directly. The sphere  $B$  is brought to rest by the collision. Find the speed of  $A$  after the collision and state the direction in which it moves.

#### Solution:



Using conservation of momentum (with speeds to the 'left' as positive)

$$m \cdot 3u - m \cdot u = m \cdot v$$

$$\therefore v = 2u$$

$\therefore$  The speed of  $A$  is  $2u$  in the opposite direction (to its initial speed).