

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

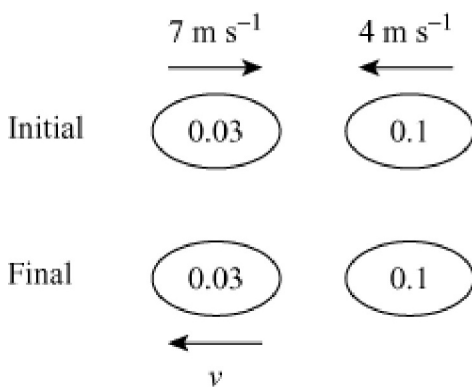
8 Momentum

Exercise A, Question 13

Question:

Two uniform smooth spheres, A of mass 0.03 kg and B of mass 0.1 kg , have equal radii and are moving directly towards each other with speeds of 7 m s^{-1} and 4 m s^{-1} , respectively. The spheres collide directly and B is reduced to rest by the impact. Find the speed of A after the impact. [A]

Solution:



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

$$\begin{aligned}
 4 \times 0.1 + 0.03 \times (-7) &= v \times 0.03 \\
 40 - 21 &= 3v \\
 v &= 6 \frac{1}{3}
 \end{aligned}$$

\therefore Speed of A is 6.33 m s^{-1} .