Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

8 Momentum

Exercise B, Question 7

Question:

When two particles collide they are both brought to rest. One particle has mass 5 kg and had velocity $\begin{bmatrix} 8 \\ -9 \end{bmatrix}$ m s^{-1} before the collision. The other particle has mass 2 kg. Find the velocity of this particle before the collision.

Solution:

By conservation of momentum,

$5\begin{bmatrix} 8 \\ -9 \end{bmatrix} + 2u = 0$ where u is the original velocity of the 2 kg mass.

$\therefore \begin{bmatrix} 40 \\ -45 \end{bmatrix} + 2u = 0$

$u = \begin{bmatrix} -20 \\ 22.5 \end{bmatrix}$

$\therefore$ Velocity was $\begin{bmatrix} -20 \\ 22.5 \end{bmatrix}$ m s^{-1}.