

4 Conservation of momentum and collisions – Part 2 — Answers

Answers

Work through these after you have tried the questions yourself.

2.1 $2.0 \times 3.0 = (2.0 + 1.0)v \Rightarrow 6.0 = 3.0v \Rightarrow v = 2.0 \text{ m/s}$.

2.2 momentum is always conserved; kinetic energy is conserved only in an elastic collision.

2.3 $0 = (50)v + (1.0)(6.0) \Rightarrow v = -\frac{6.0}{50} = -0.12 \text{ m/s}$ (about 0.12 m/s backward).

2.4 their momenta are equal in size but opposite in direction, so the total is zero; after sticking, the combined object must also have zero momentum, so it is at rest.

2.5 4.0 m/s – momentum and kinetic energy are both conserved, so for equal masses the moving ball stops and passes all its speed to the second.