## Solutions

Each answer shows the steps, then the **result**.

**2.1**

- When no net external force acts on the system

**2.2**

- $4(2) = 8 = 8v \Rightarrow v = 1$ m s$^{-1}$

**2.3**

- Zero (equal and opposite momenta)

**2.4**

- 30 kg m s$^{-1}$ (conserved)

**3.1 B**

- momentum is conserved when no net external force acts

**3.2 B**

- $3(4) = 12 = 4v \Rightarrow v = 3$ m s$^{-1}$

**3.3**

(a)

- Zero (both at rest)

(b)

- $0 = 60v + 2(10) \Rightarrow v = -0.33$ m s$^{-1}$, i.e. $0.33$ m s$^{-1}$ backward

**3.4**

(a)

- $2(5) = 10$ kg m s$^{-1}$

(b)

- $10 = 5v \Rightarrow v = 2$ m s$^{-1}$