

Solutions

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

2.1

- $x_{cm} = \frac{1(0) + 1(4)}{2} = 2 \text{ m}$

2.2

- $x_{cm} = \frac{2(0) + 6(8)}{8} = \frac{48}{8} = 6 \text{ m}$

2.3

- At the 50 cm mark (its midpoint)

2.4

- No — only a net external force can move the center of mass

3.1 B

- the net external force drives the center of mass

3.2 B

- equal masses give the midpoint, 4 m

3.3

(a)

- $x_{cm} = \frac{4(1) + 2(7)}{6} = \frac{18}{6} = 3 \text{ m}$

(b)

- Closer to the 4 kg mass, because it is weighted more heavily

3.4

(a)

- It keeps moving as before (stays at rest if it was at rest)

(b)

- Throwing is an internal force, and internal forces cannot move the center of mass