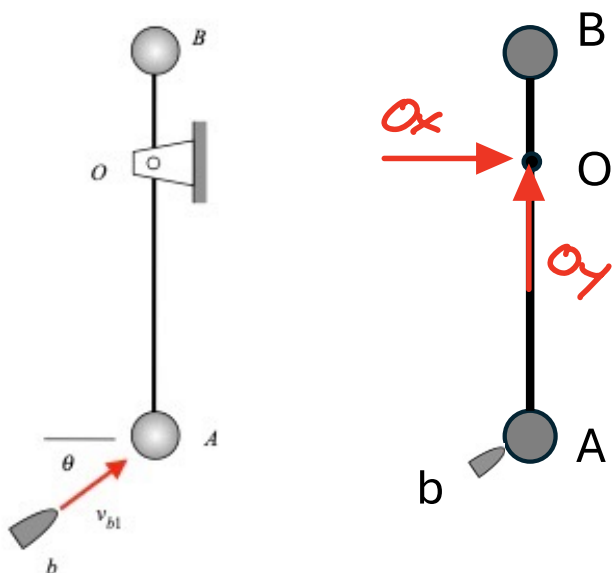


Q1

Given: $e < 1$

Find: Draw FBD for A + B + b + bar and answer T/F below



During impact, for A + B + b + bar:

- (a) TRUE or **FALSE** mechanical energy is conserved
 (b) **TRUE** or FALSE: angular momentum about O is conserved
 (c) TRUE or **FALSE** angular momentum about A is conserved
 (d) TRUE or **FALSE** linear momentum is conserved

(a) $e \neq 1$

(b) $\sum \vec{M}_O = \vec{0} \Rightarrow$ ang. mom. about O conserved

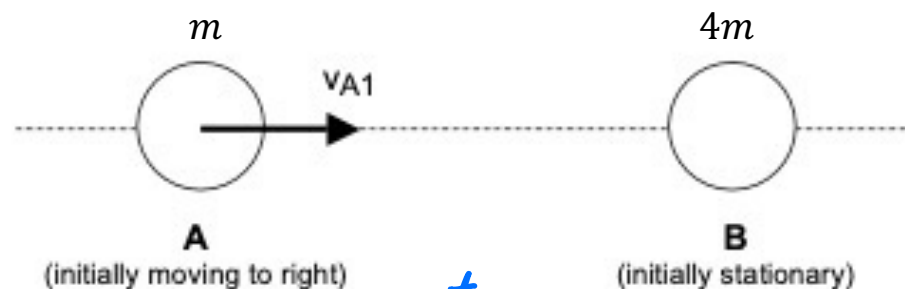
(c) $\sum \vec{M}_A \neq \vec{0} \Rightarrow$ ang. mom. about A not conserved

(d) $\sum \vec{F} \neq \vec{0} \Rightarrow$ lin. mom. not conserved

Q2

Given: $v_{A2} = 0$

Find: The value for e .



$$\begin{aligned} \bullet \sum F_n = 0 &\Rightarrow \\ m v_{A1} + 4m v_{B1} &= m v_{A2} + 4m v_{B2} \\ \hookrightarrow v_{B2} &= \frac{1}{4} v_{A1} \\ \bullet e &= - \left[\frac{v_{B2} - v_{A2}}{v_{B1} - v_{A1}} \right] = \frac{v_{B2}}{v_{A1}} = \frac{1}{4} \end{aligned}$$