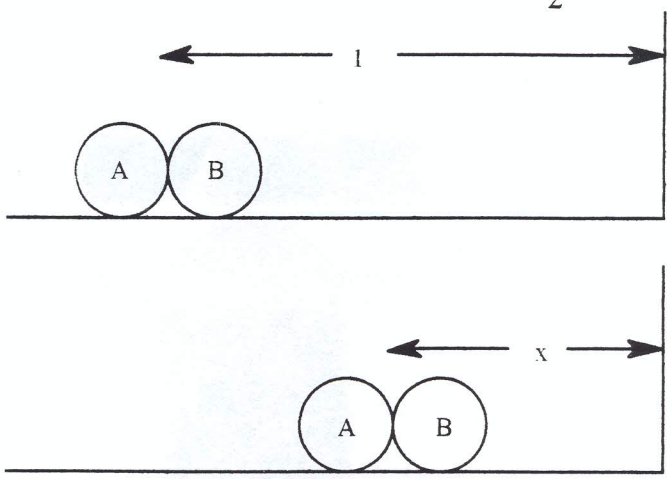
5 PCM $mu + 0 = mv_1 + mv_2 \Rightarrow v_1 + v_2 = u$

NEL $v_1 - v_2 = -e(u - 0) \Rightarrow v_1 - v_2 = -eu$

$$v_1 = \frac{u}{2}(1 - e)$$

$$v_2 = \frac{u}{2}(1 + e)$$



B strikes the wall with velocity $\frac{u}{2}(1 + e)$ and rebounds with velocity $\frac{eu}{2}(1 + e)$

$$\frac{1 - x}{\frac{u}{2}(1 - e)} = \frac{1}{\frac{u}{2}(1 + e)} + \frac{x}{\frac{eu}{2}(1 + e)}$$

$$x = \frac{2e^2}{1 + e^2}$$

OR

Time for B to reach the wall $= \frac{\text{distance}}{\text{speed}} = \frac{1}{\frac{u}{2}(1 + e)} = \frac{2}{u(1 + e)}$

In this time A travels $\frac{u}{2}(1 - e)\frac{2}{u(1 + e)} = \frac{1 - e}{1 + e}$

and is now $1 - \frac{1 - e}{1 + e} = \frac{2e}{1 + e}$ from the wall

B's rebound velocity is $\frac{eu}{2}(1 + e)$

$$\frac{x}{\frac{eu}{2}(1 + e)} = \frac{\frac{2e}{1 + e} - x}{\frac{u}{2}(1 - e)}$$

$$x = \frac{2e^2}{1 + e^2}$$