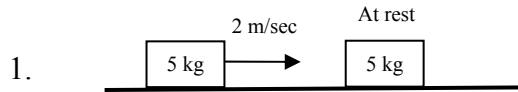


W7.02**MOMENTUM – KEY**

Elastic Collisions

The masses below collide completely elastically. Assume that there is no friction. Diagrams on the left are before the collision. Diagrams on the right are after the collision.



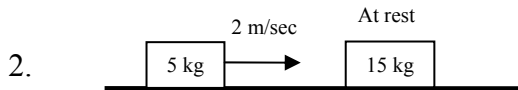
$$p_{\text{total initial}} = 10 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 10 \text{ J}$$



$$p_{\text{total final}} = 10 \text{ kg m/s} \quad v = 0 \text{ m/s}$$

$$KE_{\text{total final}} = 10 \text{ J}$$



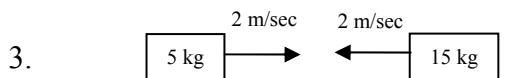
$$p_{\text{total initial}} = 10 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 10 \text{ J}$$



$$p_{\text{total final}} = 10 \text{ kg m/s} \quad v = -1 \text{ m/s}$$

$$KE_{\text{total final}} = 10 \text{ J}$$



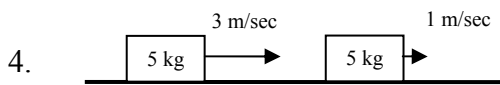
$$p_{\text{total initial}} = -20 \text{ kg m/s}$$

$$KE_{\text{total initial}} = 40 \text{ J}$$



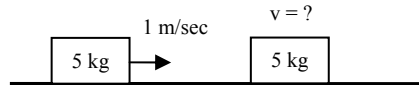
$$p_{\text{total final}} = -20 \text{ kg m/s} \quad v = -4 \text{ m/s}$$

$$KE_{\text{total final}} = 40 \text{ J}$$



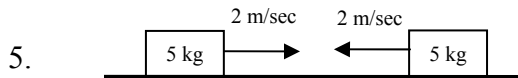
$p_{\text{total initial}} = 20 \text{ kg m/s}$

$KE_{\text{total initial}} = 25 \text{ J}$



$p_{\text{total final}} = 20 \text{ kg m/s } v = 3 \text{ m/s}$

$KE_{\text{total final}} = 25 \text{ J}$



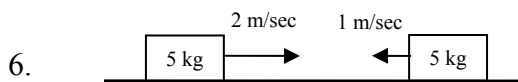
$p_{\text{total initial}} = 0 \text{ kg m/s}$

$KE_{\text{total initial}} = 20 \text{ J}$



$p_{\text{total final}} = 0 \text{ kg m/s } v = -2 \text{ m/s}$

$KE_{\text{total final}} = 20 \text{ J}$



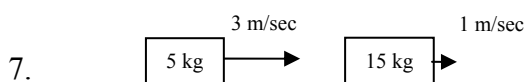
$p_{\text{total initial}} = 5 \text{ kg m/s}$

$KE_{\text{total initial}} = 12.5 \text{ J}$



$p_{\text{total final}} = 5 \text{ kg m/s } v = -1 \text{ m/s}$

$KE_{\text{total final}} = 12.5 \text{ J}$



$p_{\text{total initial}} = 30 \text{ kg m/s}$

$KE_{\text{total initial}} = 30 \text{ J}$



$p_{\text{total final}} = 30 \text{ kg m/s } v = 0 \text{ m/s}$

$KE_{\text{total final}} = 30 \text{ J}$