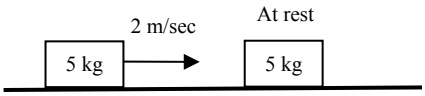
W7.02

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.

1.



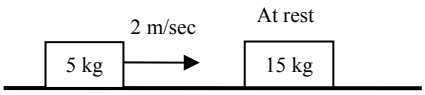
$p_{total\ initial}$=10 kg m/s

$KE_{total\ initial}$= 10 J

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

$KE_{total\ final}$= 10 J

2.



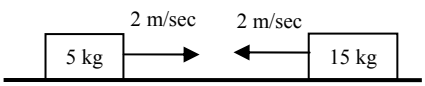
$p_{total\ initial}$=10 kg m/s

$KE_{total\ initial}$= 10 J

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

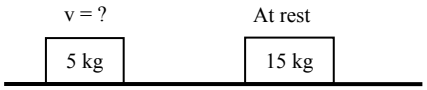
$KE_{total\ final}$= 10 J

3.



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

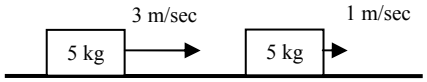
$KE_{total\ initial}$= 40 J



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

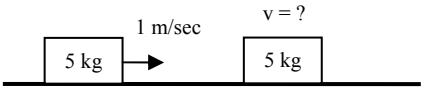
$KE_{total\ final}$= 40 J

4.



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

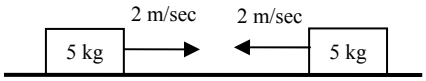
$KE_{total\ initial}$= 25 J



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

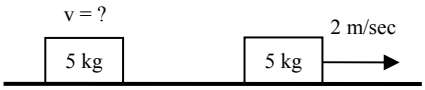
$KE_{total\ final}$= 25 J

5.



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

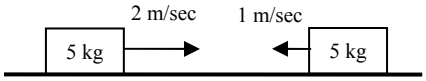
$KE_{total\ initial}$= 20 J



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

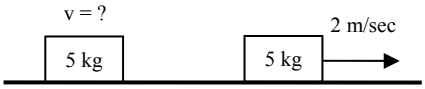
$KE_{total\ final}$= 20 J

6.



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

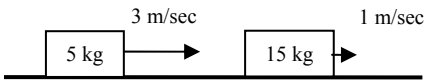
$KE_{total\ initial}$= 12.5 J



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

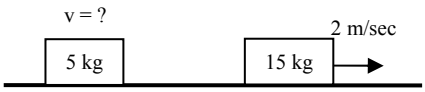
$KE_{total\ final}$= 12.5 J

7.



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

$KE_{total\ initial}$= 30 J



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

$KE_{total\ final}$= 30 J