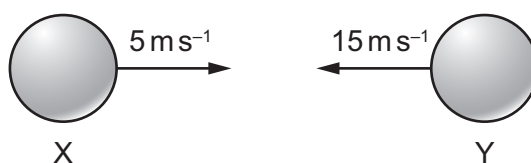


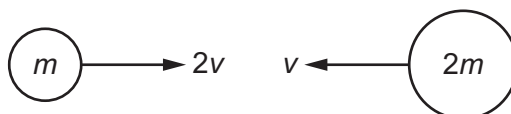
- 8 Two balls X and Y are moving towards each other with speeds of  $5\text{ ms}^{-1}$  and  $15\text{ ms}^{-1}$  respectively.



They make a perfectly elastic head-on collision and ball Y moves to the right with a speed of  $7\text{ ms}^{-1}$ .

What is the speed and direction of ball X after the collision?

- A  $3\text{ ms}^{-1}$  to the left  
B  $13\text{ ms}^{-1}$  to the left  
C  $3\text{ ms}^{-1}$  to the right  
D  $13\text{ ms}^{-1}$  to the right
- 9 In the absence of air resistance, a ball thrown horizontally from a tower with velocity  $v$ , will land after time  $T$  seconds.
- If, however, air resistance is taken into account, which statement is correct?
- A The ball lands with a horizontal velocity less than  $v$  after more than  $T$  seconds.  
B The ball lands with a horizontal velocity less than  $v$  after  $T$  seconds.  
C The ball lands with a horizontal velocity  $v$  after more than  $T$  seconds.  
D The ball lands with a horizontal velocity  $v$  after  $T$  seconds.
- 10 Two balls, of masses  $m$  and  $2m$ , travelling in a vacuum with initial velocities  $2v$  and  $v$  respectively, collide with each other head-on, as shown.



After the collision, the ball of mass  $m$  rebounds to the left with velocity  $v$ .

What is the loss of kinetic energy in the collision?

- A  $\frac{3}{4}mv^2$       B  $\frac{3}{2}mv^2$       C  $\frac{9}{4}mv^2$       D  $\frac{9}{2}mv^2$