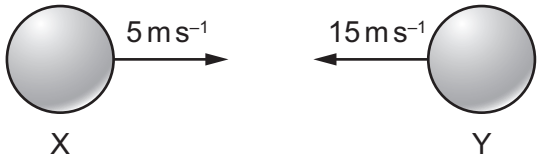
8 Two balls X and Y are moving towards each other with speeds of $5\,m\,s^{-1}$ and $15\,m\,s^{-1}$ respectively.



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

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

A $3\,m\,s^{-1}$ to the left

B $13\,m\,s^{-1}$ to the left

C $3\,m\,s^{-1}$ to the right

D $13\,m\,s^{-1}$ 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?

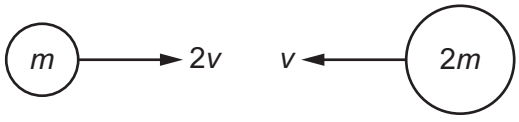
A The ball lands with a horizontal velocity less than v after more than T seconds.

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** $\frac{9}{2}mv^2$