**5** An object of mass *m*, moving at speed *u* along a frictionless horizontal surface, collides head-on with a stationary object of mass 4*m*.


before the collision

After the collision, the object of mass *m* rebounds along its initial path with $\frac{1}{4}$ of its kinetic energy before the collision.

What is the speed of the object of mass 4*m* after the collision?

**A** $\frac{u}{8}$ **B** $\frac{3\,u}{16}$ **C** $\frac{5\,u}{16}$ **D** $\frac{3\,u}{8}$