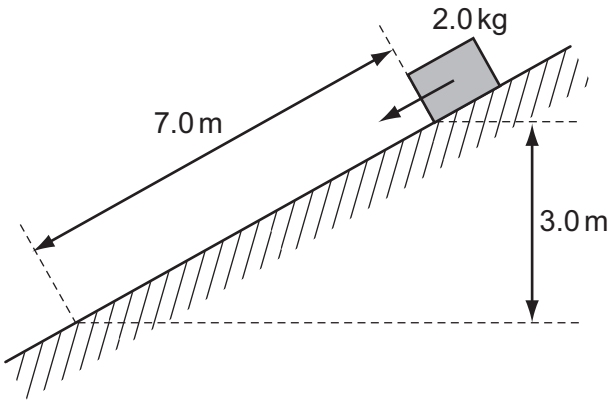
14 A steel sphere is dropped vertically onto a horizontal metal plate. The sphere hits the plate with a speed u, leaves it at a speed v, and rebounds vertically to half of its original height.

Which expression gives the value of $\frac{v}{u}$?

A $\frac{1}{2^2}$ **B** $\frac{1}{2}$ **C** $\frac{1}{\sqrt{2}}$ **D** $1 - \frac{1}{\sqrt{2}}$

15 A block of mass 2.0 kg is released from rest on a slope. It travels 7.0 m down the slope and falls a vertical distance of 3.0 m. The block experiences a frictional force parallel to the slope of 5.0 N.



What is the speed of the block after falling this distance?

A $4.9\,m\,s^{-1}$ **B** $6.6\,m\,s^{-1}$ **C** $8.6\,m\,s^{-1}$ **D** $10.1\,m\,s^{-1}$

16 A body travelling with a speed of $10\,m\,s^{-1}$ has kinetic energy 1500 J.

If the speed of the body is increased to $40\,m\,s^{-1}$, what is its new kinetic energy?

A 4500 J **B** 6000 J **C** 24 000 J **D** 1 350 000 J

Space for working