16 A ball drops onto a horizontal surface and bounces elastically.

What happens to the kinetic energy of the ball during the very short time that it is in contact with the surface?

A Most of the kinetic energy is lost as heat and sound.

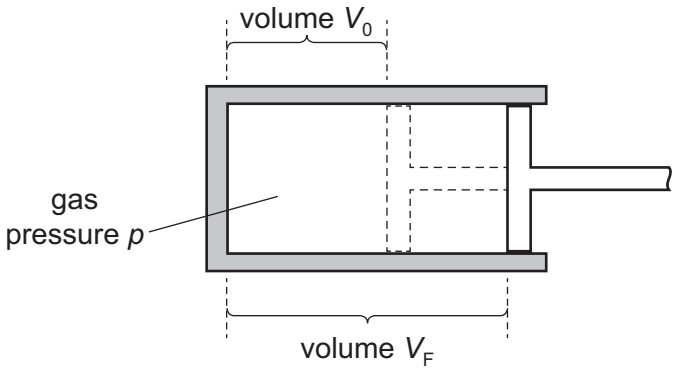
B The kinetic energy decreases to zero and then returns to its original value.

C The kinetic energy remains constant because it is an elastic collision.

D The kinetic energy remains constant in magnitude but changes direction.

17 Some gas in a cylinder is supplied with thermal energy q.

The gas does useful work in expanding at constant pressure p from volume V_0 to volume V_F, as shown.



Which expression gives the efficiency of this process?

A $\frac{pV_0}{q}$ **B** $\frac{V_F}{V_0 q}$ **C** $\frac{p(V_F - V_0)}{q}$ **D** $\frac{(V_F - V_0)}{V_0 q}$

18 An object of mass 0.30 kg is thrown vertically upwards from the ground with an initial velocity of $8.0\,m\,s^{-1}$. The object reaches a maximum height of 1.9 m.

How much work is done against air resistance as the object rises to its maximum height?

A 4.0 J **B** 5.6 J **C** 9.6 J **D** 15 J

19 A water pump raises a mass of 27×10^3 kg of water through a vertical distance of 80 m in a time of 1.0 hour.

What is the average useful output power of the pump?

A 0.60 kW **B** 5.9 kW **C** 36 kW **D** 350 kW