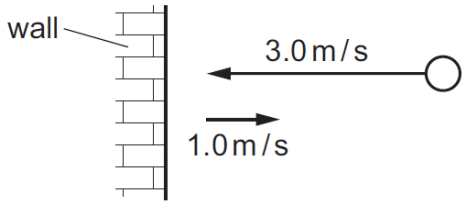
Momentum – 2021 IGCSE 0625

1. June/2021/Paper_21/No.8

A ball has a mass of 2.0 kg. The ball approaches a wall at a speed of 3.0 m/s and rebounds at a speed of 1.0 m/s.



What is the impulse on the wall?

A 4.0 N **B** 4.0 Ns **C** 8.0 N **D** 8.0 Ns

2. June/2021/Paper_22/No.8

A tennis ball has a mass of 57 g.

A tennis player hits the tennis ball with a tennis racket. The tennis ball has a velocity of 25 m/s when it hits the racket.

The velocity of the tennis ball when it leaves the player's racket is 15 m/s in the opposite direction from its approaching direction.

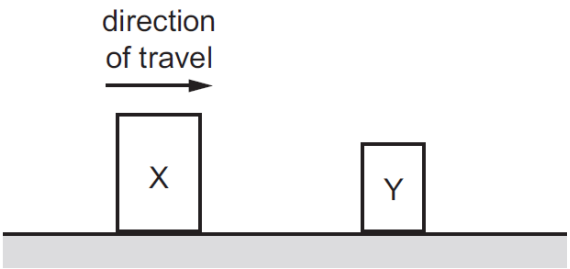
The average force exerted by the tennis racket on the ball is 35 N.

For how long is the tennis ball in contact with the tennis racket?

A 0.015 s **B** 0.016 s **C** 0.065 s **D** 0.65 s

3. June/2021/Paper_23/No.8

Object X moves to the right along a frictionless surface towards a stationary object Y, as shown.



They make a noise as they collide and then both objects move to the right.

Which equation is correct?

A change in momentum of X = change in momentum of Y

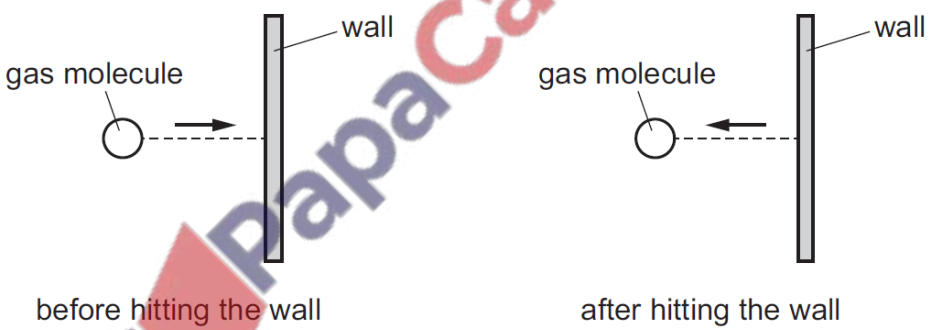
B impulse of force acting on X = impulse of force acting on Y

C kinetic energy of X before collision = (kinetic energy of X + kinetic energy of Y) after collision

D momentum of X before collision = (momentum of X + momentum of Y) after collision

4. March/2021/Paper_22/No.9

A gas molecule strikes the wall of a container. The molecule rebounds with the same speed.



What happens to the kinetic energy and what happens to the momentum of the molecule?

	kinetic energy	momentum
A	changes	changes
B	changes	stays the same
C	stays the same	changes
D	stays the same	stays the same

5. June/2021/Paper_41/No.2

Fig. 2.1 shows a wooden trolley of mass 1.2 kg at rest on the rough surface of a bench.

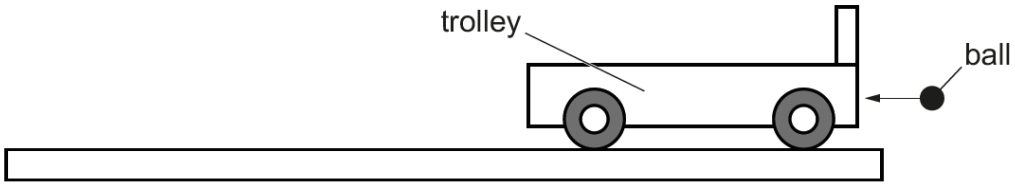


Fig. 2.1

A ball of mass 0.52 g travels horizontally towards the trolley. The ball embeds itself in the wood of the trolley. The trolley moves with an initial speed of 0.065 m / s.

(a) Calculate:

(i) the impulse exerted on the trolley

impulse = ... [2]

(ii) the speed of the ball as it hits the trolley.

speed = ... [2]

(b) As the trolley moves across the rough surface, it slows down and stops.

Explain, in terms of the work done, the energy change that takes place as the trolley slows down.

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..... [3]

[Total: 7]