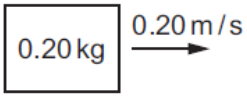
Momentum – 2020 IGCSE 0625

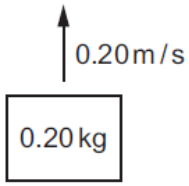
1. Nov/2020/Paper_21/No.9

An object with a mass of 0.20 kg moves at 0.20 m/s, as shown.

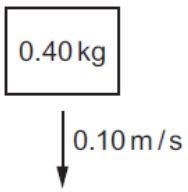


Which other object has a momentum that is identical to the momentum of this object?

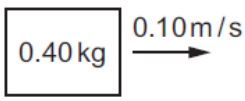
A



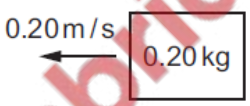
B



C



D



2. Nov/2020/Paper_22/No.9

A footballer kicks a stationary football.

His foot is in contact with the ball for 0.050 s.

The mass of the ball is 0.40 kg.

The speed of projection of the ball is 25 m/s.

What is the average force exerted on the ball by his foot?

A 0.32 N **B** 0.50 N **C** 200 N **D** 1300 N

3. Nov/2020/Paper_23/No.9

A ball of mass m falls vertically and hits a hard surface.

Its speed on hitting the surface is v_1.

It rebounds vertically upwards with speed v_2.

What is the change in momentum of the ball?

A mv_1 **B** mv_2 **C** $m(v_1 + v_2)$ **D** $m(v_2 - v_1)$

4. Nov/2020/Paper_41/No.1

Fig. 1.1 shows an ice-hockey player moving on ice. He is preparing to hit the solid disc called a puck.

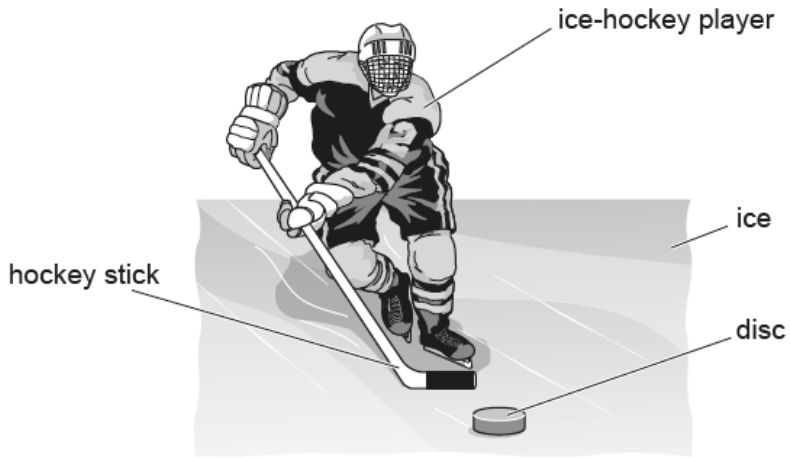


Fig. 1.1

The disc of mass 0.16 kg is moving horizontally across the surface of the ice at a speed of 15 m/s.

(a) Calculate the magnitude of the momentum of the disc.

magnitude of momentum = ... [2]

(b) The hockey player strikes the disc with his hockey stick and the momentum of the disc changes. The disc gains momentum of 3.0 kg m/s at 45° to the original direction of travel of the disc, as shown in Fig. 1.2.

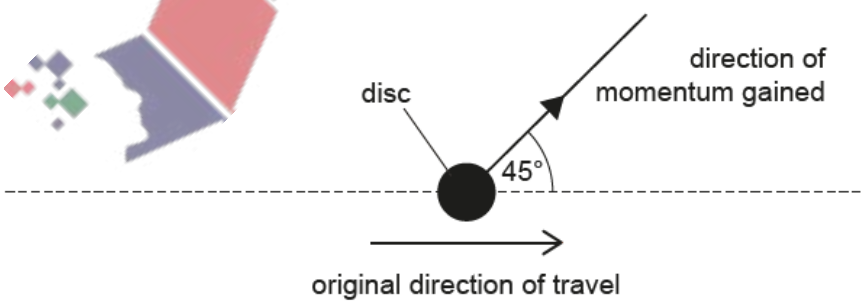


Fig. 1.2 (view from above)

(i) State the magnitude of the impulse exerted on the disc and the direction, in degrees, of the impulse relative to the original direction of travel.

magnitude of impulse = ...

direction of impulse: ..... ° to original direction

[1]

(ii) Determine the magnitude of the new momentum of the disc and its new direction relative to the original direction of travel by drawing a scale diagram.

magnitude of new momentum = ...

direction of new momentum: ..... ° to original direction

[4]

[Total: 7]

5. Nov/2020/Paper_43/No.2(b)

(b) Calculate the vertical momentum of the ball as it hits the water.

momentum = ... [2]