3 Curling is a sport played on ice.

A player slides stone A across the ice towards a scoring zone.

The ice reduces friction so that there is negligible friction when the stone is sliding.

(a) Stone A leaves the player's hand with a velocity of 2.90 m/s.

The mass of stone A is 17 kg.

(i) State the formula linking momentum, mass and velocity.

(1)

(ii) Show that the momentum of stone A is approximately 50 kg m/s.

(2)

(b) Stone A slides towards the scoring zone.

In the scoring zone, stone A collides with a stationary stone, B.

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(i) After the collision, both stones move in the same direction as the initial direction of stone A.

The velocity of stone A after the collision is 0.40 m/s.

Calculate the velocity of stone B after the collision.

[mass of stone B = 19 kg]

(4)

velocity of stone B = ... m/s

(ii) When the stones collided, they were in contact for a time of 25 ms.

Calculate the magnitude of the force stone A exerted on stone B in this collision.

(3)

force = ... N

(Total for Question 3 = 10 marks)