

- 2 Fig. 2.1 shows two skaters A and B moving along the same straight line towards each other in an amusement park with speeds of 11 m s^{-1} and 5.0 m s^{-1} respectively just before they collide. The masses of skaters A and B are 60 kg and 90 kg, respectively.

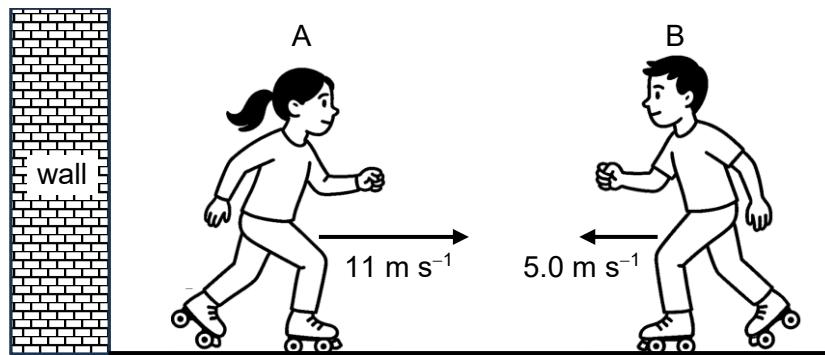


Fig. 2.1

- (a) State the *principle of conservation of momentum*.

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.....

[1]

- (b) Assuming that the collision is elastic, show that skater A moves towards the left with a speed of 8.2 m s^{-1} after the collision.

[2]

(c) After the collision, skater A hits the wall and bounces off the wall with a speed of 1.0 m s^{-1} .

- (i) The variation with time t of the force F that the wall exerts on skater A is shown in Fig. 2.2.

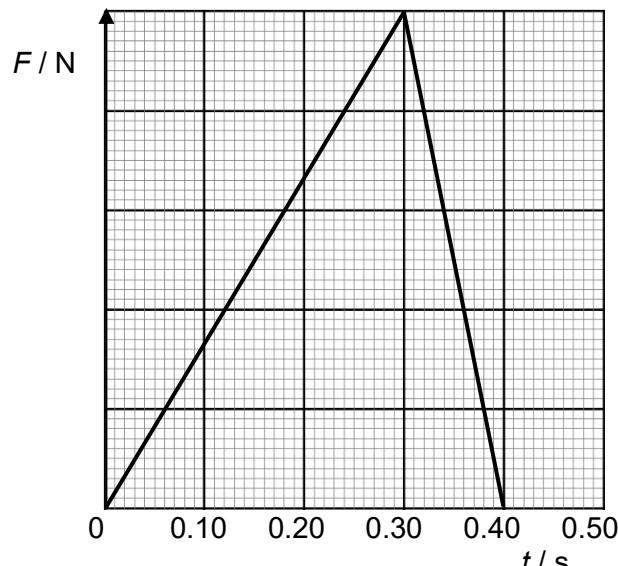


Fig. 2.2

Determine the maximum force exerted by the wall on skater A.

$$\text{maximum force} = \dots \text{N} \quad [2]$$

- (ii) Explain how the walls in the amusement park can be made safer so that the maximum force exerted on the skater is reduced.

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[2]