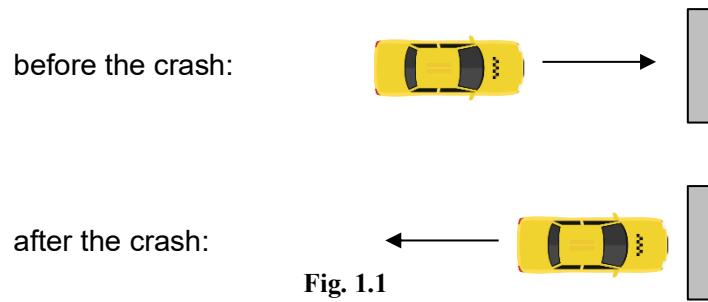


- 1 A toy car collides into a fixed wall and rebounds with the same speed as shown in Fig. 1.1.



- (a) (i) State the type of collision that occurred between the car and the wall.

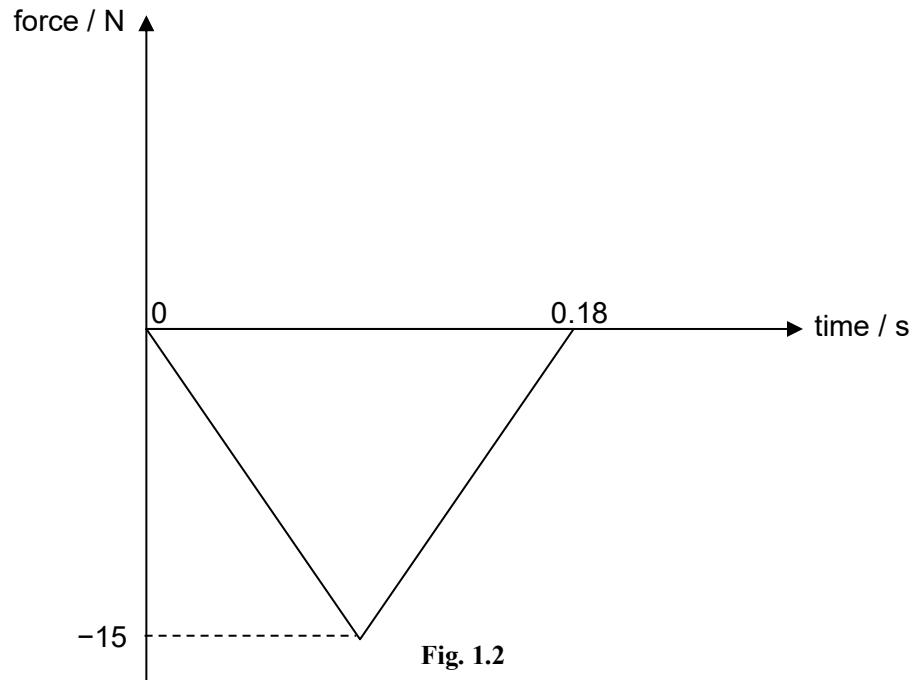
..... [1]

- (ii) During the collision the momentum of the car changes. State and explain whether momentum is conserved in this collision.

.....  
.....  
.....

[2]

- (b) Fig. 1.2 shows the variation with time of the magnitude of force acting on the toy car due to the wall during the collision. Take rightwards as positive.



- (i) Determine the magnitude of the initial momentum of the car.

$$\text{initial momentum} = \dots \text{ kg m s}^{-1} \quad [2]$$

- (ii) The mass of the toy car is 0.65 kg. Determine the magnitude of average acceleration of the toy car during the collision.

$$\text{average acceleration} = \dots \text{ m s}^{-2} \quad [2]$$

- (iii) A rubber bumper is now secured to the front of the toy car. The toy car undergoes a similar collision with the wall.

On Fig. 1.2, sketch a new graph showing the variation with time of the force acting on the toy car.

[1]

