

- 7 Scientists test the safety features of a car by crashing it into a large block of concrete.

A dummy is placed in the driver's seat and the scientists video the crash.



- (a) In one test, the dummy and the car travel at 8 m/s.

The mass of the dummy is 72 kg.

Calculate the momentum of the dummy.

(2)

Momentum = ..... kg m/s



- (b) In another test, the momentum of the dummy changes by  $920 \text{ kg m/s}$  in a time of  $0.17 \text{ s}$ .

Calculate the average horizontal force acting on the dummy during this time.

(2)

Average force = ..... N

- (c) These tests help to make our roads safer.

- (i) State **two** factors that affect the stopping distance of a car driven on a road.

(2)

1 .....

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2 .....

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- (ii) Use ideas about momentum to explain how the crumple zone of a car helps to reduce injuries during a crash.

(3)

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(Total for Question 7 = 9 marks)

