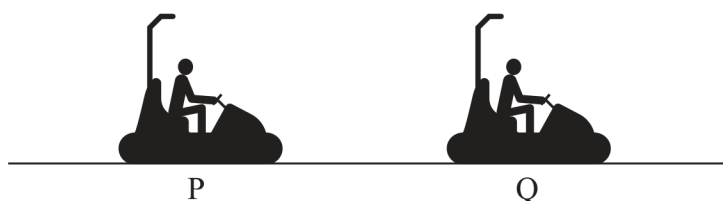


17 The diagram shows two bumper cars, P and Q, at an amusement park.



Q was stationary. P was moving at a speed of 2.10 ms^{-1} towards Q.

P collided with Q. After the collision, P and Q moved off in the same direction. P moved with a speed of 1.15 ms^{-1} . Q moved with a speed of 1.57 ms^{-1} .

(a) (i) Show that the total mass of Q was about 150 kg.

total mass of P = 250 kg

(3)

(ii) State one assumption you made in your calculation in (a)(i).

(1)

(iii) The collision lasted a total time of 1.35 s.

Calculate the average horizontal force on Q during the collision.

(3)

Average horizontal force =



- (b) Explain why P decelerates during the collision. Your answer should make reference to Newton's laws of motion.

(3)

(Total for Question 17 = 10 marks)