

AS Level Physics A
H156/01 Breadth in Physics

Question Set 4

1. A student uses a motion sensor to investigate the motion of a trolley crashing into a soft barrier. Fig. 21 shows the displacement s against time t graph for the trolley in one experiment.

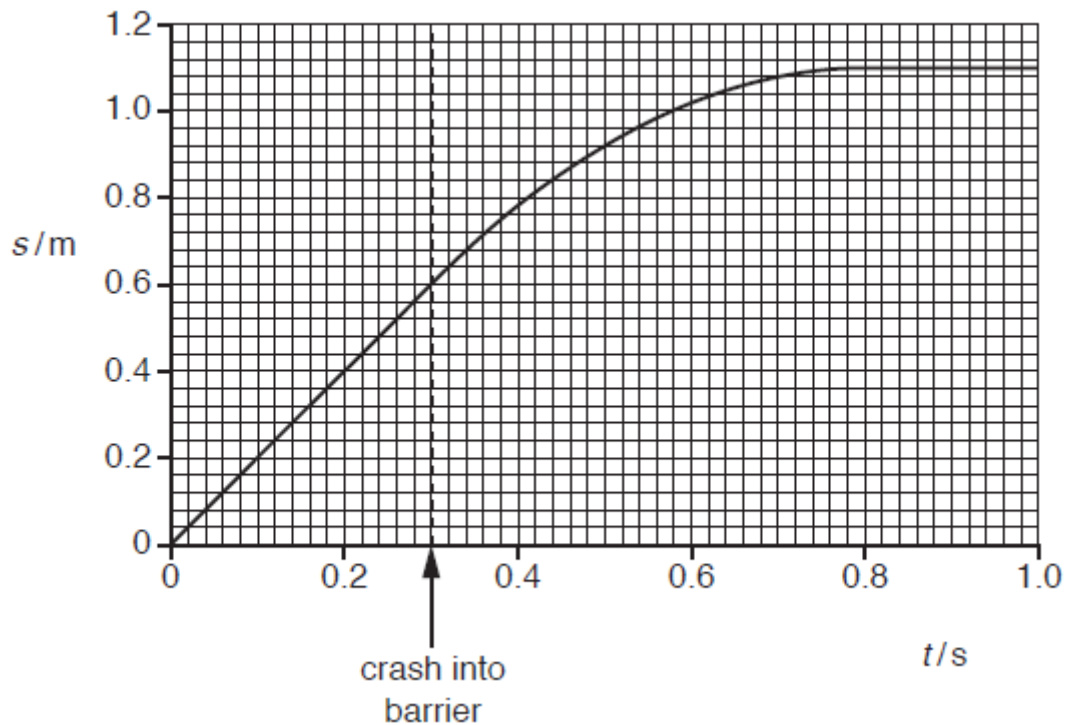


Fig. 21

The trolley has mass 900 g and an initial speed of 2.0 ms^{-1} . It crashes into the barrier at time $t = 0.3 \text{ s}$.

- (a) Calculate the initial kinetic energy of the trolley.

kinetic energy = _____ J

[1]

- (b) Use Fig. 21 to describe and explain the variation of the velocity of the trolley from $t = 0$ to $t = 1.0 \text{ s}$.

[4]

- (c) The student assumes that the deceleration of the trolley is constant during the crash. Use Fig. 21 to determine the magnitude of the deceleration.

deceleration = _____ ms^{-2}

[2]

Total Marks for Question Set 4: 7

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