

AS Level Physics A
H156/01 Breadth in Physics

Question Set 19

- 1 A metal ball is released from rest. It falls vertically towards the ground. Fig. 22 shows the variation with time t of the displacement s of the ball.

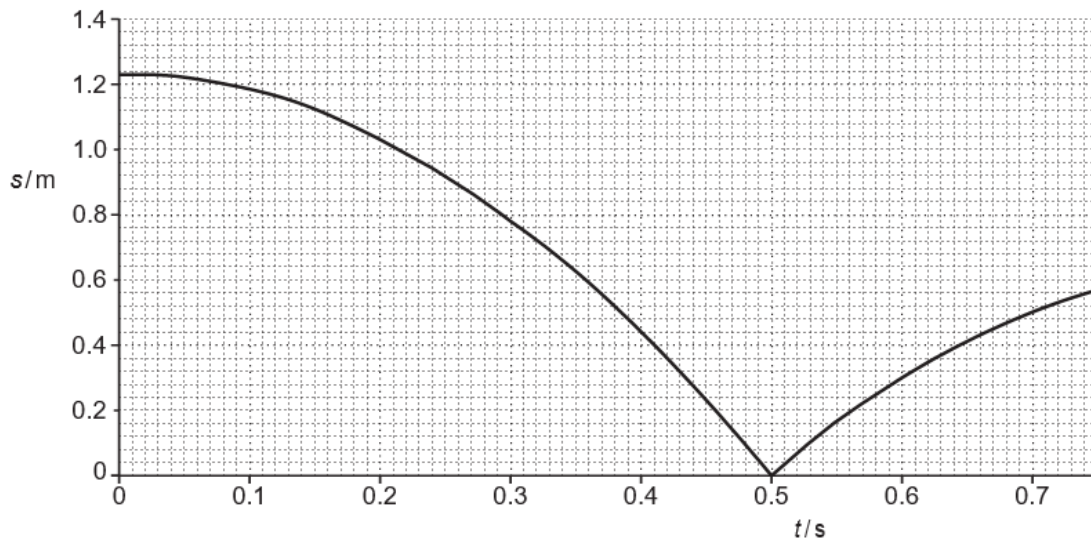


Fig. 22

Air resistance has negligible effect on the motion of the ball.

The ball hits the ground at $t = 0.50$ s.

During the collision, the ball is in contact with the ground for a time of 1.8 ms.

The mass of the ball is 56 g.

- (a) Describe and explain the variation of the velocity of the ball from $t = 0.20$ s to $t = 0.70$ s.

No calculations are required.

[4]

- (b) Use an equation of motion to show that the speed of the ball is 4.9 ms^{-1} just before it hits the ground.

[2]

- (c) Draw a suitable tangent to the curve in Fig. 22 and show that the **rebound** speed of the ball is about 3.5 ms^{-1} .

[3]

- (d) Calculate the average resultant force acting on the ball during the collision.

force = _____ N

[2]

Total Marks for Question Set 19: 11

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