

# Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

Exam style practice papers

Exercise MM1A, Question 1

**Question:**

A ball is dropped from a height of 8 metres. The ball falls vertically until it hits the ground.

- (a) Find the speed of the ball when it hits the ground. (2 marks)
- (b) Find the time that it takes the ball to reach the ground. (2 marks)
- (c) State the key assumption that you have made about the motion of the ball. (1 mark)
- (d) Sketch a velocity-time graph for the motion of the ball. (2 marks)

**Solution:**

$$\begin{aligned} \text{Using } v^2 &= u^2 + 2as, \\ \text{(a) } v^2 &= 0 + 2 \times g \times 8 \\ v^2 &= 16g \\ v &= 12.52 \end{aligned}$$

Speed of the ball is  $12.5 \text{ m s}^{-1}$

$$\begin{aligned} \text{Using } s &= ut + \frac{1}{2}at^2, \\ 8 &= \frac{1}{2}gt^2 \\ \text{(b) } t &= \sqrt{\frac{8}{\frac{1}{2}g}} \\ t &= 1.2777 \end{aligned}$$

Time is 1.28 s

(c) No air resistance.

(d)

