

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise C, Question 2

Question:

A ball, that is initially at rest, falls from a height of 3 m to the ground.

(a) Find the time that the ball takes to fall this distance.

(b) Find the speed of the ball when it hits the ground.

Solution:

$$s = ut + \frac{1}{2}at^2$$

$$3 = 0 \times t + \frac{1}{2} \times 9.8 \times t^2$$

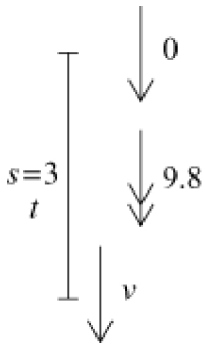
$$\therefore \frac{3 \times 2}{9.8} = t^2$$

$$\therefore t = \sqrt{\left(\frac{3 \times 2}{9.8}\right)} = 0.78246\dots = 0.782 \text{ seconds (3 s.f.)}$$

$$v^2 = u^2 + 2as$$

$$v^2 = 0^2 + 2 \times 9.8 \times 3$$

$$\therefore v = \sqrt{(2 \times 9.8 \times 3)} = 7.6681\dots = 7.67 \text{ m s}^{-1} \text{ (3 s.f.)}$$



© Harcourt Education Ltd 2005