Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise C, Question 1

Question:

A ball is dropped from rest at a height of 2 m. Find the time that the ball takes to fall to the ground, if it is:

(a) on the Earth,

(b) on the Moon, where $g = 1.6 \text{ m s}^{-2}$.

Solution:

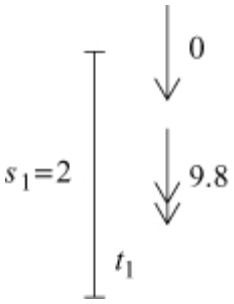
(a)

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

$$2 = 0 \times t + \frac{1}{2} \times 9.8 \times t_1^2$$

$$\therefore \frac{2 \times 2}{9.8} = t_1^2$$

$$\therefore t_1 = \sqrt{\left(\frac{4}{9.8}\right)} = 0.63887... = 0.639 \text{ seconds (3 s.f.)}$$



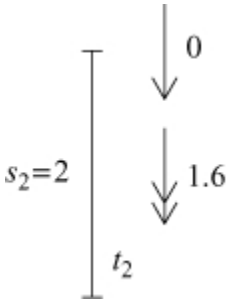
(b)

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

$$2 = 0 \times t + \frac{1}{2} \times 1.6 \times t_2^2$$

$$\therefore \frac{2 \times 2}{1.6} = t_2^2$$

$$\therefore t_2 = \sqrt{\left(\frac{4}{1.6}\right)} = 1.5811... = 1.58 \text{ seconds (3 s.f.)}$$



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