

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise B, Question 3

Question:

A car accelerates uniformly as it moves along a straight road. Its velocity increases from 5 m s^{-1} to 12 m s^{-1} in a 10-second period.

- (a) Find the acceleration of the car.
 (b) Find the distance travelled by the car.

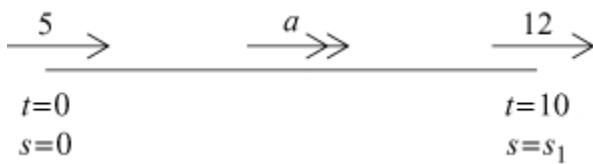
Solution:

$$v = u + at$$

$$12 = 5 + a \times 10$$

(a) $12 - 5 = 10a$

$$a = \frac{7}{10} = 0.7 \text{ m s}^{-2}$$



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

$$12^2 = 5^2 + 2 \times 0.7 \times s$$

(b) $\therefore 144 - 25 = 1.4s$

$$s = \frac{119}{1.4} = 85 \text{ m}$$

$$s = \frac{(u+v)}{2} t$$

or $s_1 = \frac{(5+12)}{2} \times 10$

$$s_1 = 85 \text{ m}$$