

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise B, Question 2

Question:

A car accelerates uniformly from 10 m s^{-1} to 20 m s^{-1} as it travels 500 m along a straight road.

- (a) Find the acceleration of the car.
 (b) Find the time taken by the car to travel the 500 m.

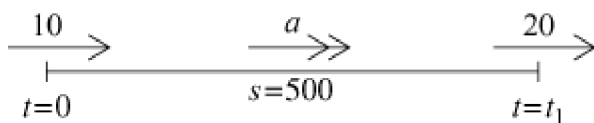
Solution:

$$\begin{aligned} v^2 &= u^2 + 2as \\ 20^2 &= 10^2 + 2 \times a \times 500 \\ 400 &= 100 + 1000a \end{aligned}$$

$$(a) \quad 400 - 100 = 1000a$$

$$\therefore 300 = 1000a$$

$$\therefore a = \frac{300}{1000} = 0.3 \text{ m s}^{-2}$$



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

$$(b) \quad 500 = \frac{(10+20)}{2} \times t_1$$

$$\therefore 500 = 15 \times t_1$$

$$t_1 = \frac{500}{15} = 33 \frac{1}{3} \text{ seconds}$$