Solutionbank M1

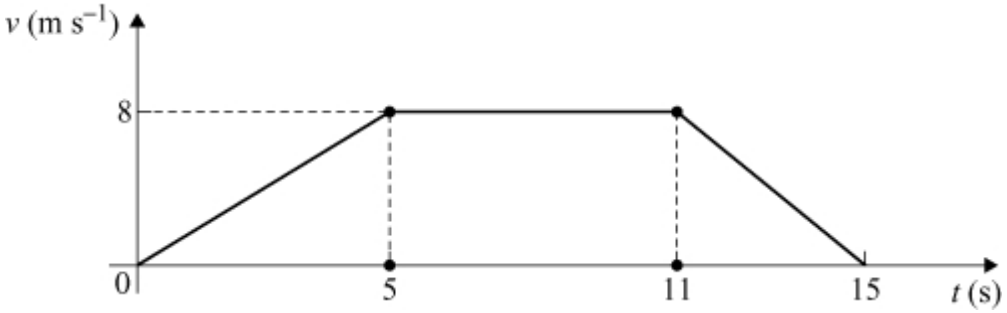
Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise A, Question 1

Question:

The graph shows how the velocity of a car changes during a short journey along a straight road. Find the distance travelled by the car and the acceleration on each stage of its journey.



Solution:

Distance travelled $= \left(\frac{1}{2} \times 5 \times 8\right) + \left[(11 - 5) \times 8\right] + \left[\frac{1}{2} \times (15 - 11) \times 8\right]$

$= 84 \text{ m}$

In 1st stage, acceleration $= \frac{8}{5} = 1.6 \text{ m s}^{-2}$

In 2nd stage, acceleration $= 0$ (the velocity is constant)

In 3rd stage, acceleration $= \frac{-8}{(15 - 11)} = -2$

i.e. a deceleration of 2 m s^{-2}.