Solutionbank M1

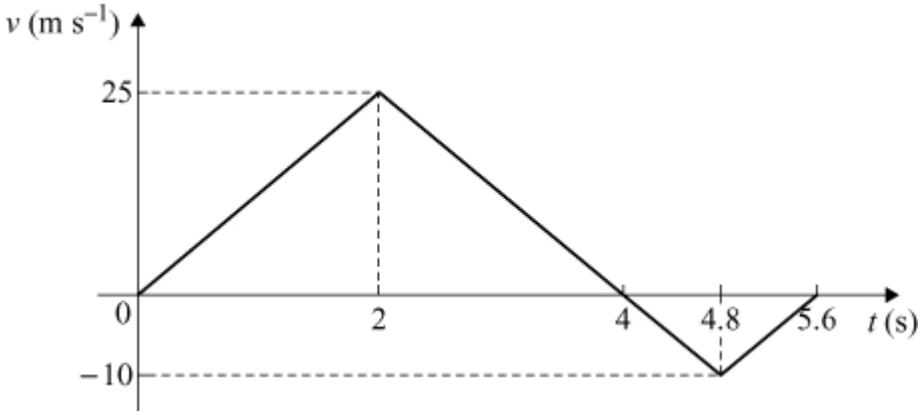
Heinemann Modular Maths for Edexcel AS and A-level

2 Kinematics in one dimension

Exercise A, Question 11

Question:

A student attempts to model the motion of a bungee jumper. He draws the velocity-time graph shown:



(a) State the two non-zero times at which the velocity of the bungee jumper is zero.

(b) Find the distance that the bungee jumper falls during the first 4 seconds.

(c) Find the total distance travelled by the bungee jumper during the 5.6 seconds illustrated on the graph.
[A]

Solution:

(a) $t = 4$ s, $t = 5.6$ s

(b) Distance $= \left[\frac{1}{2} \times 2 \times 25 \right] + \left[\frac{1}{2} \times \left(4 - 2 \right) \times 25 \right] = 50$ m

(c) $\text{Total distance} = 50 + \left[\frac{1}{2} \times (4.8 - 4) \times 10 \right] + \left[\frac{1}{2} \times (5.6 - 4.8) \times 10 \right]$

$= 58$ m