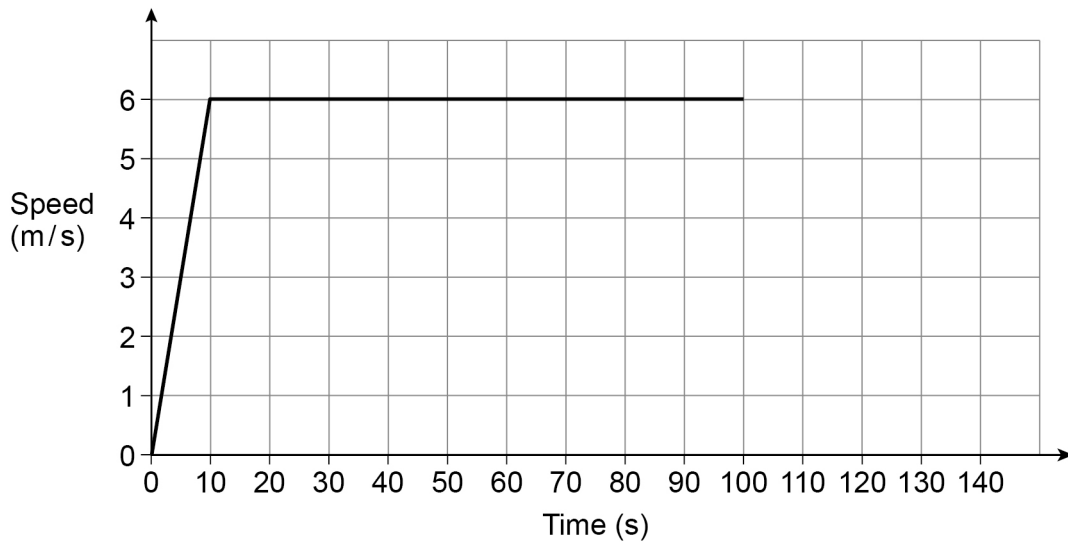


- 1 Helena ran an 800-metre race in 140 seconds.
The speed-time graph represents the first 100 seconds of her run.



Helena ran the last 40 seconds with constant deceleration.

Work out her speed as she finished the race.

[4 marks]

$$\text{distance}_1 = \frac{1}{2} \times 10 \times 6 = 30 \text{ m} \quad (1)$$

$$\text{distance}_2 = 6 \times 90 = 540 \text{ m}$$

$$\text{distance ran} = 30 + 540 = 570 \text{ m}$$

$$800 - 570 = 230 \text{ m balance} \quad (1)$$

$$\frac{1}{2} \times (v + 6) \times 40 = 230 \quad (1)$$

$$v + 6 = 11.5$$

$$v = 5.5 \quad (1)$$

Answer 5.5 metres per second