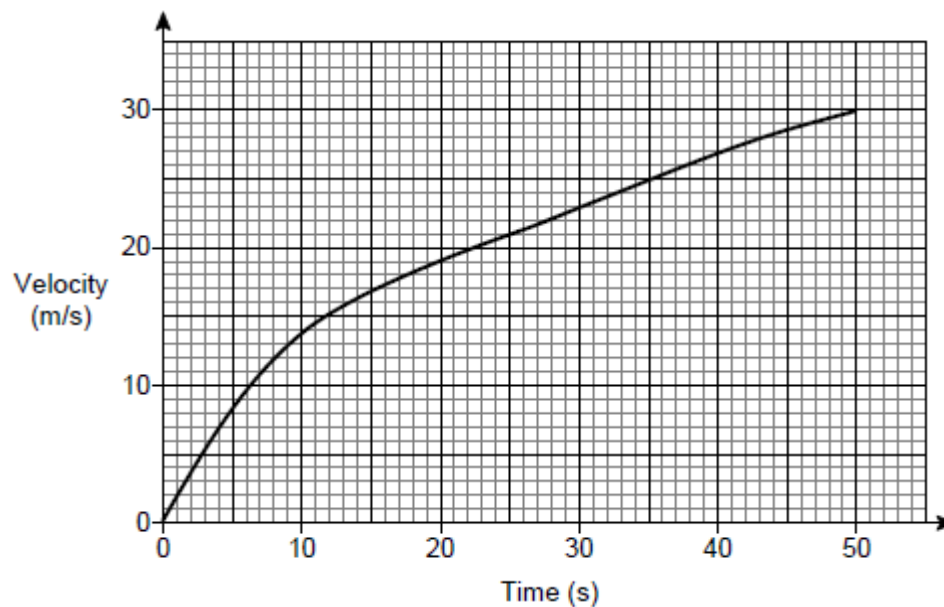


## Non-Calculator

### Q1.

Here is the velocity-time graph of a car for 50 seconds.



- (a) Work out the average acceleration during the 50 seconds.

Give the units of your answer.

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Answer \_\_\_\_\_

(2)

- (b) Estimate the time during the 50 seconds when  
the instantaneous acceleration = the average acceleration

You **must** show your working on the graph.

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Answer \_\_\_\_\_

(2)

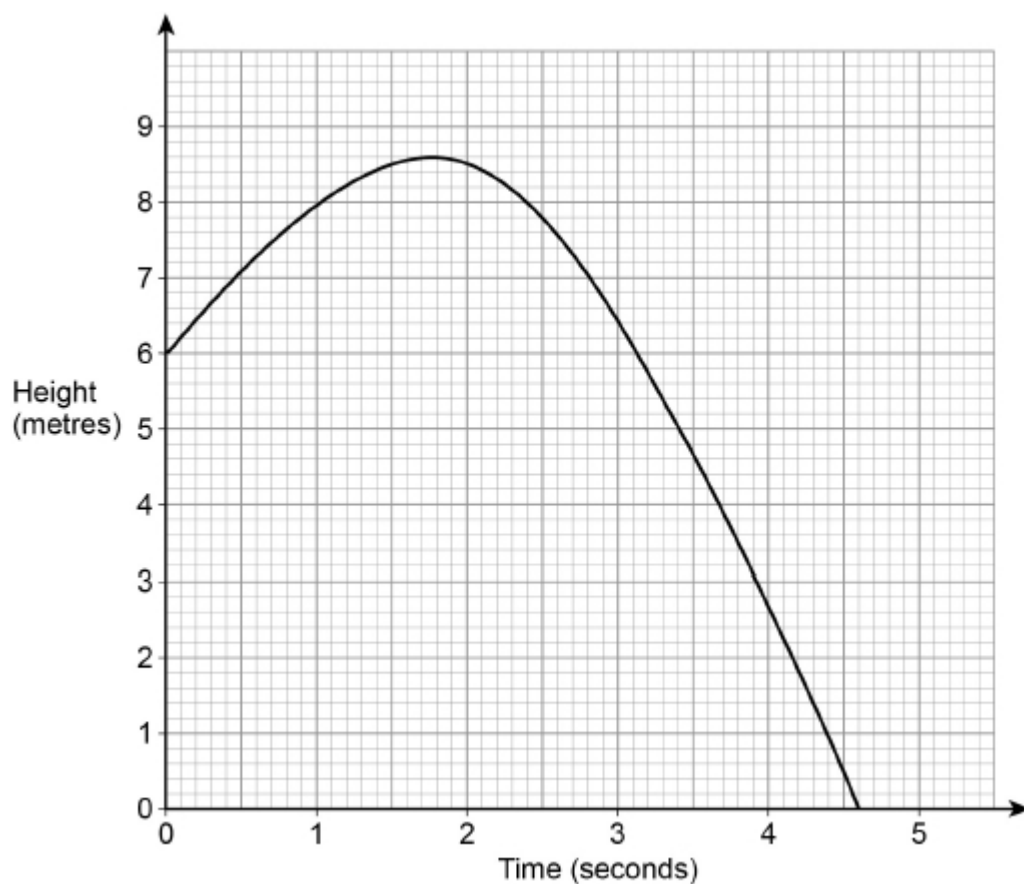
(Total 4 marks)

## Calculator

**Q2.**

A ball is thrown from a point 6 metres above the ground.

The graph shows the height of the ball above the ground, in metres.



Estimate the speed of the ball, in m/s, after 1 second.

You **must** show your working.

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Answer \_\_\_\_\_ m/s

(Total 2 marks)

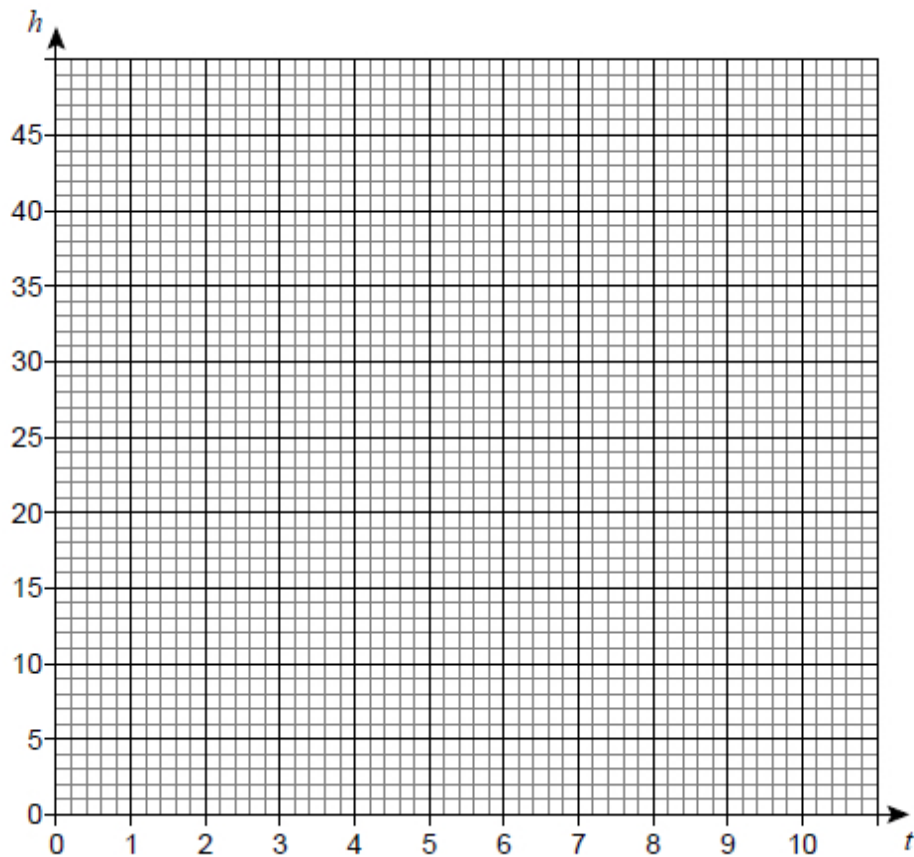
**Q3.**

The height,  $h$  metres, of a particle at time,  $t$  seconds, is given by the function

$$h = 0 \quad 0 \leq t < 2$$

$$h = (14 - t)(t - 2) \quad 2 \leq t \leq 10$$

- (a) Draw a graph to show the height of the particle in the first 10 seconds.



(3)

- (b) By joining the points on the graph where  $t = 3$  and  $t = 7$  with a straight line, work out the average rate of change of height between 3 and 7 seconds.

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Answer ..... m/s

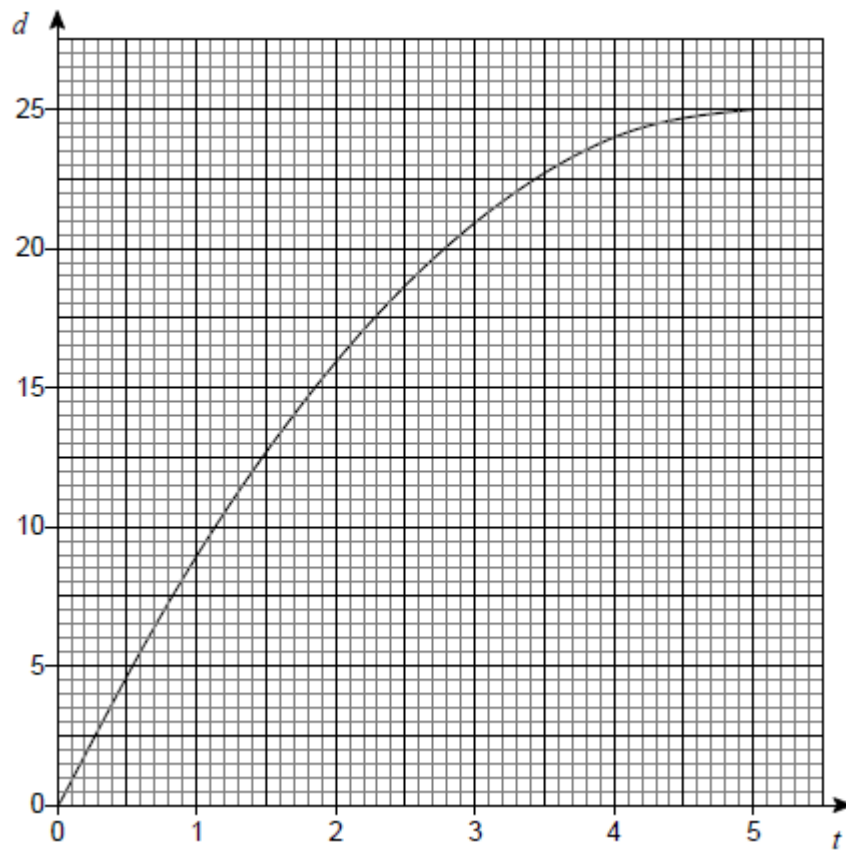
(2)

(Total 5 marks)

**Q4.**

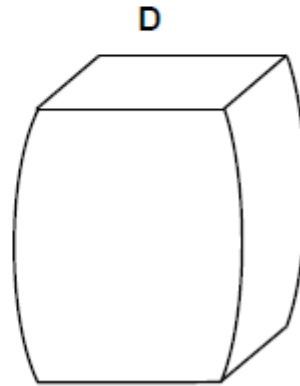
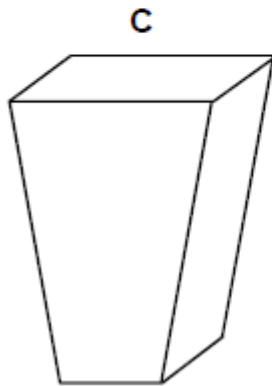
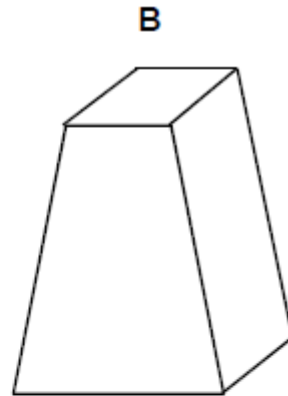
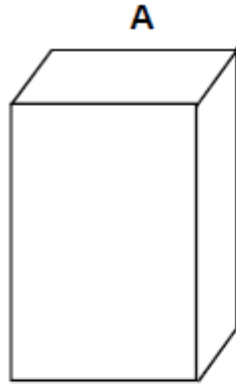
A container is filled with water in 5 seconds.

The graph shows the depth of water,  $d$  cm, at time  $t$  seconds.



- (a) The water flows into the container at a constant rate.

Which diagram represents the container?  
Circle the correct letter.



(1)

- (b) Use the graph to estimate the rate at which the depth of water is increasing at 3 seconds.

You **must** show your working.

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Answer \_\_\_\_\_ cm/s

(2)

(Total 3 marks)