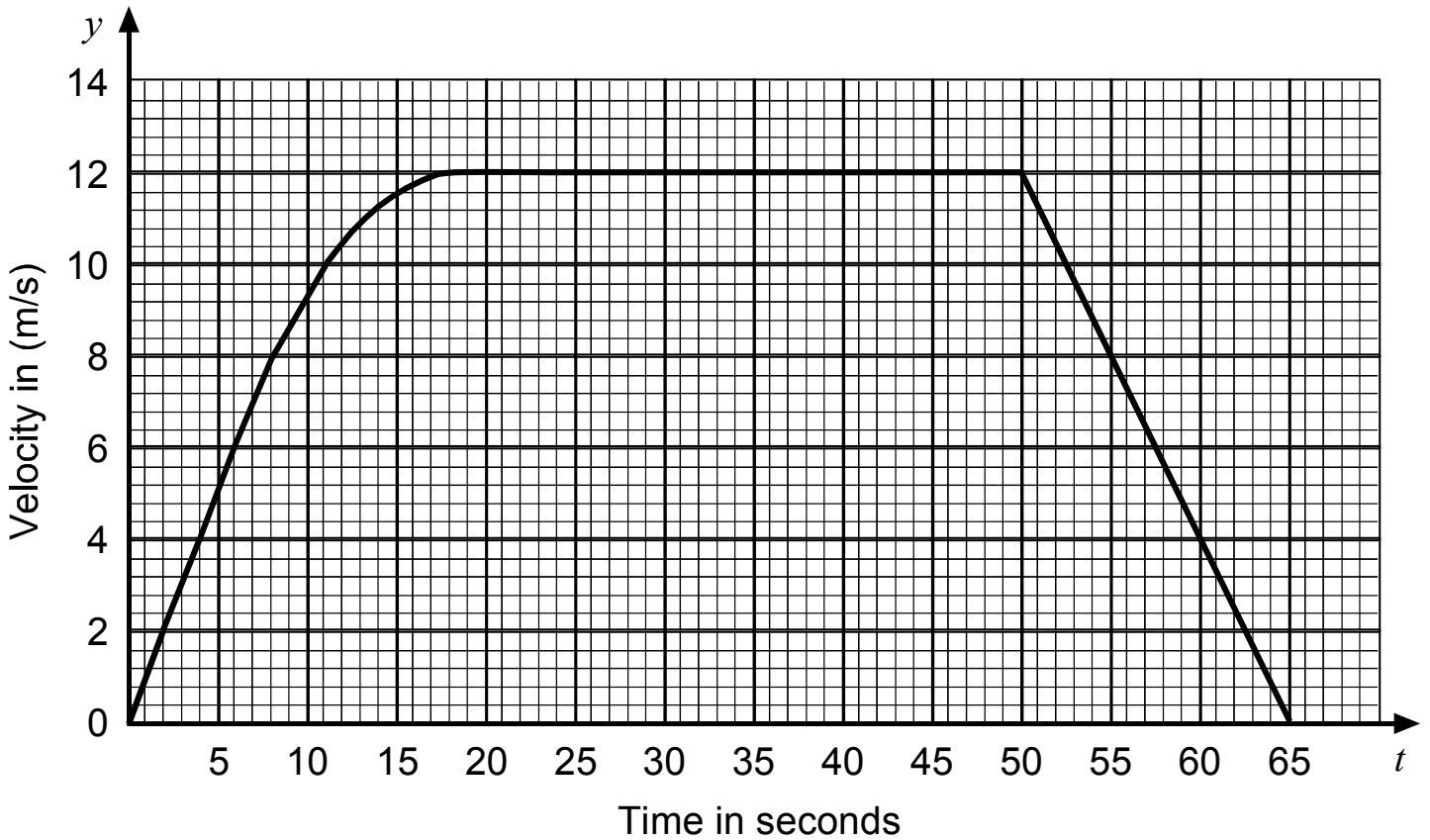


1. A car travels between two sets of traffic lights.  
 The diagram represents the velocity/time graph of the car.



The car leaves the first set of traffic lights.

- (a) Use the graph to find the velocity of the car after 15 seconds.

..... (1)

- (b) Calculate an estimate for the acceleration of the car, in  $m/s^2$ , after 10 seconds.

..... (2)

2. A toy car is placed on the floor of a sports hall.

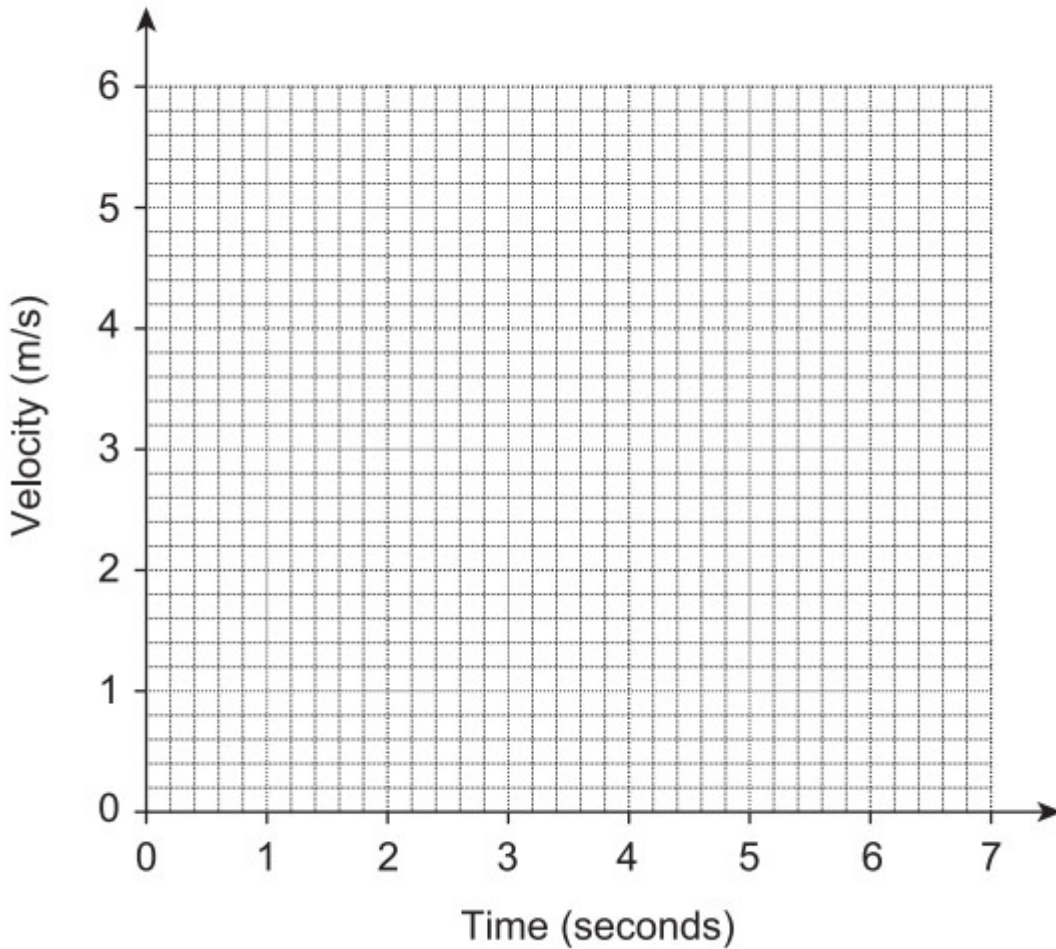
It moves in a straight line starting from rest.

It travels with constant acceleration for 4 seconds reaching a velocity of 5m/s.

It then slows down with constant deceleration of  $1\text{m/s}^2$  for 2 seconds.

It then hits a wall and stops.

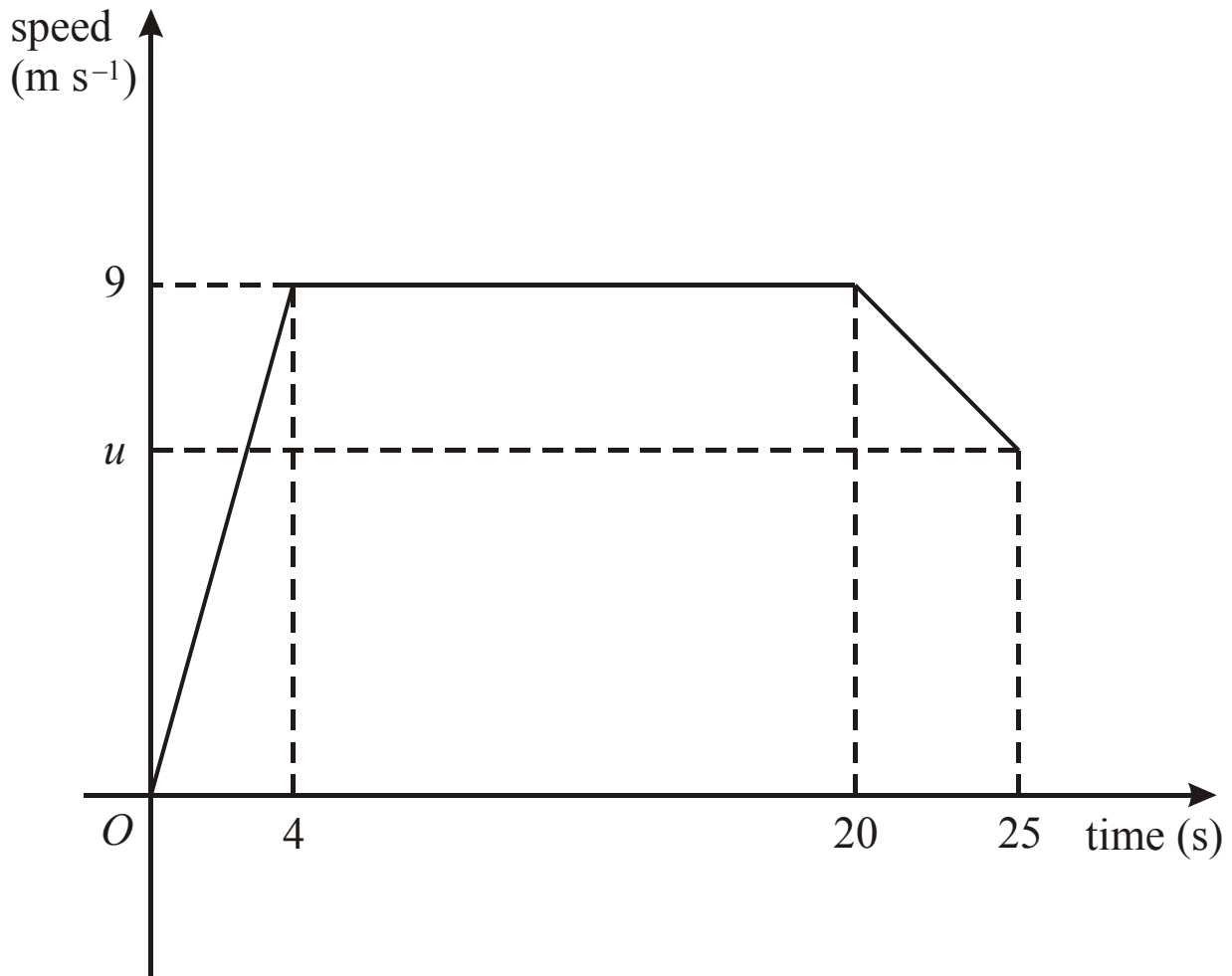
a) Draw a velocity-time graph for the toy car. (3)



b) Work out the total distance travelled by the toy car.

..... m (3)

3. A sprinter runs a race of 200 m.  
 Her total time for running the race is 25 s.  
 Below is a sketch of the speed-time graph for the motion of the sprinter.



Calculate:

- a) The acceleration in the first 4 seconds of the race

..... (2)

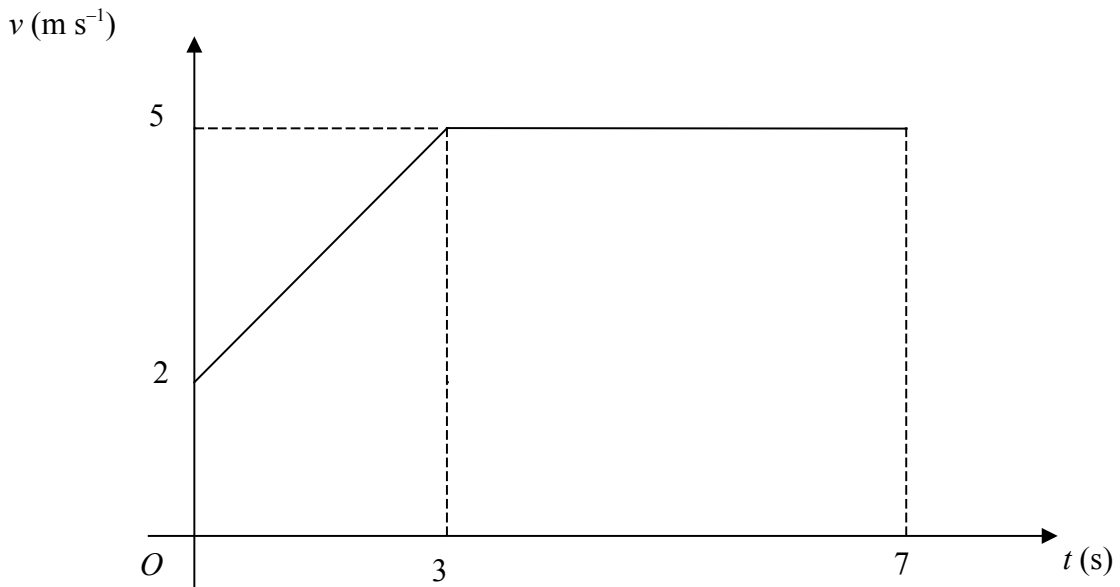
- b) The distance covered by the sprinter in the first 20 seconds of the race

..... (2)

- c) The value of  $u$

..... (3)

4. Below is a sketch of the speed-time graph of a cyclist moving on a straight road over a 7 second period.



Calculate:

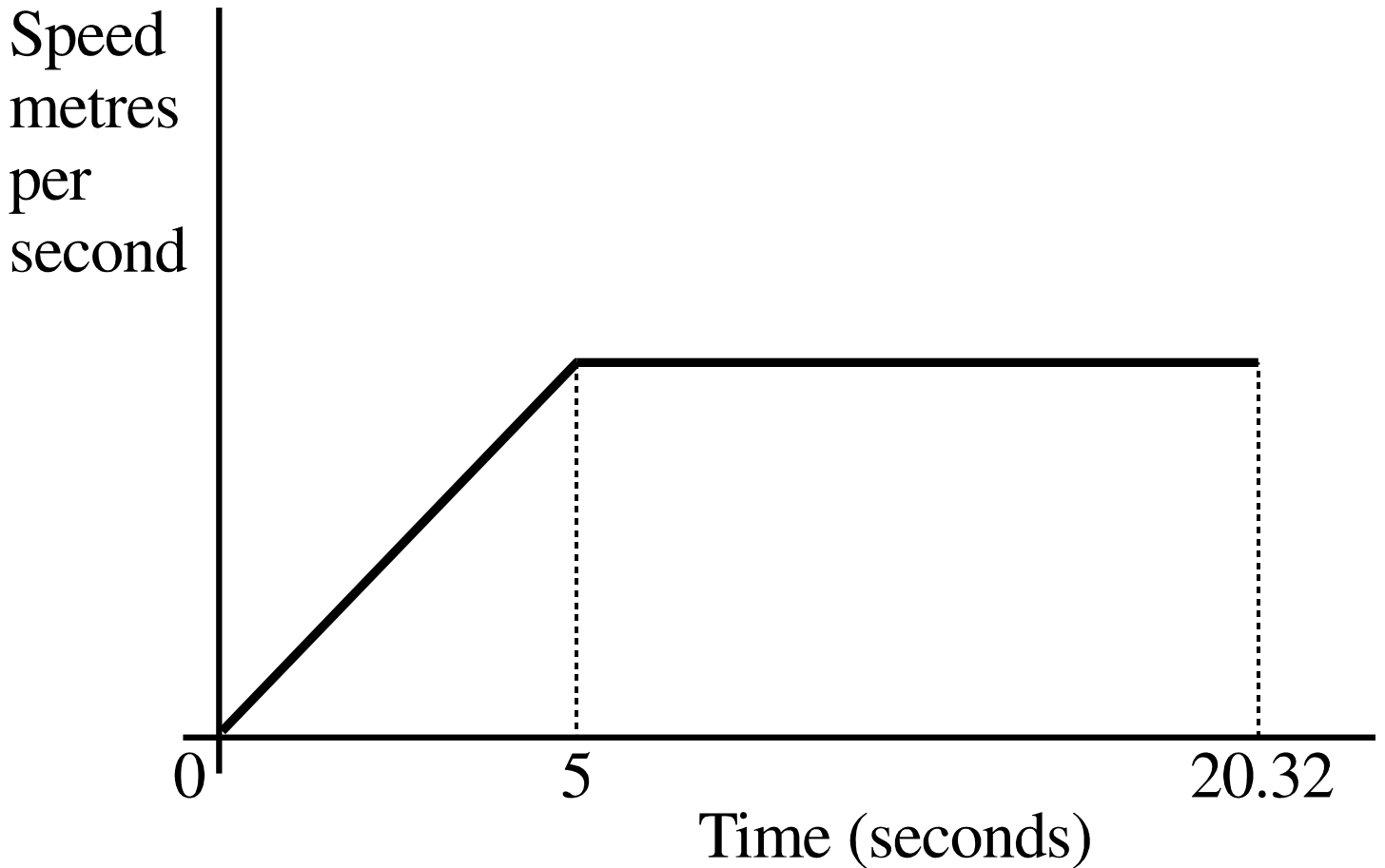
a) The acceleration for the first 3 seconds

..... (2)

b) The distance covered by the cyclist over the 7 second period

..... (2)

5. A sprinter runs a race of 200 m.  
 His total time for running the race is 20.32s.  
 Below is a sketch of the speed-time graph for the motion of the sprinter.



Calculate:

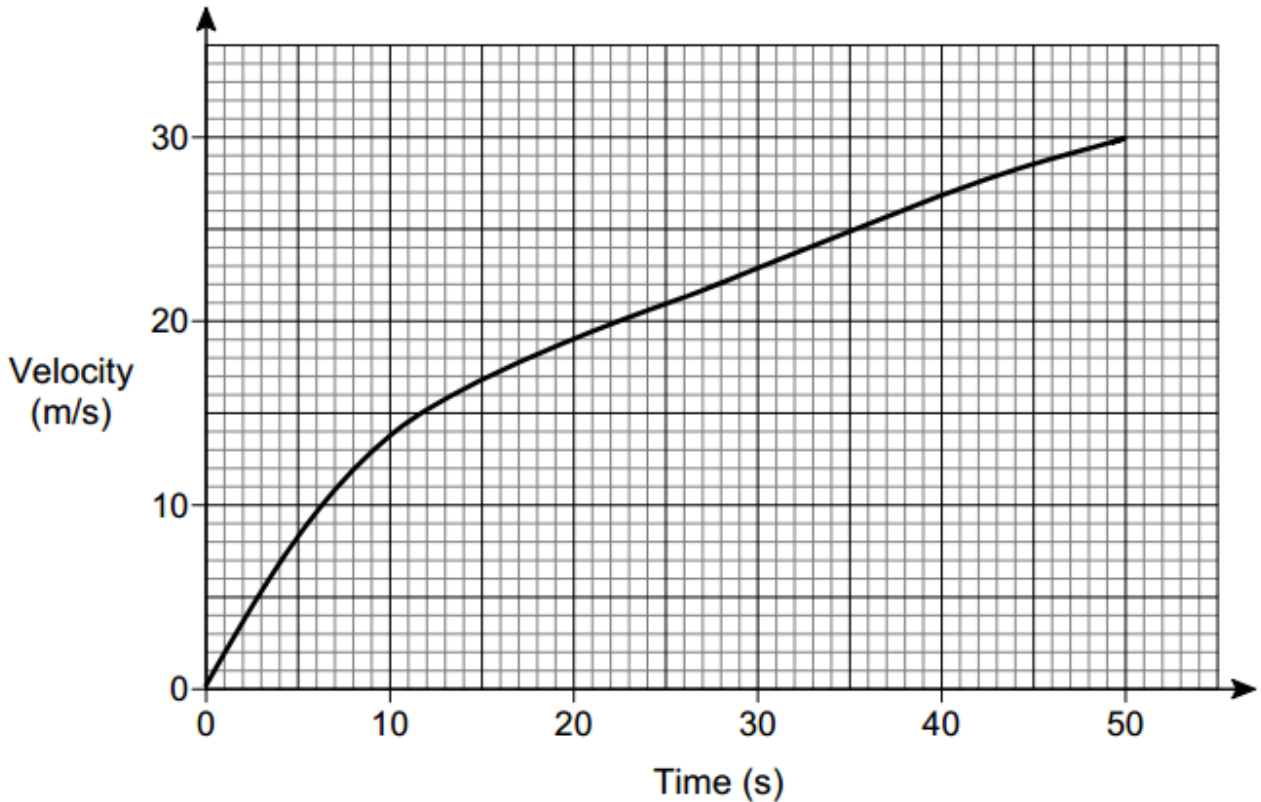
- a) The maximum speed of the sprinter during the race

..... (4)

- b) The distance covered by the sprinter in the first 5 seconds of the race

..... (2)

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



Work out the average acceleration during the 50 seconds.  
Give the units of your answer.

..... (2)

Estimate the time during the 50 seconds when  
the instantaneous acceleration = the average acceleration  
You must show your working on the graph.

..... (2)