

Name: _____

GCSE (1 – 9)

Velocity Time Graphs

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

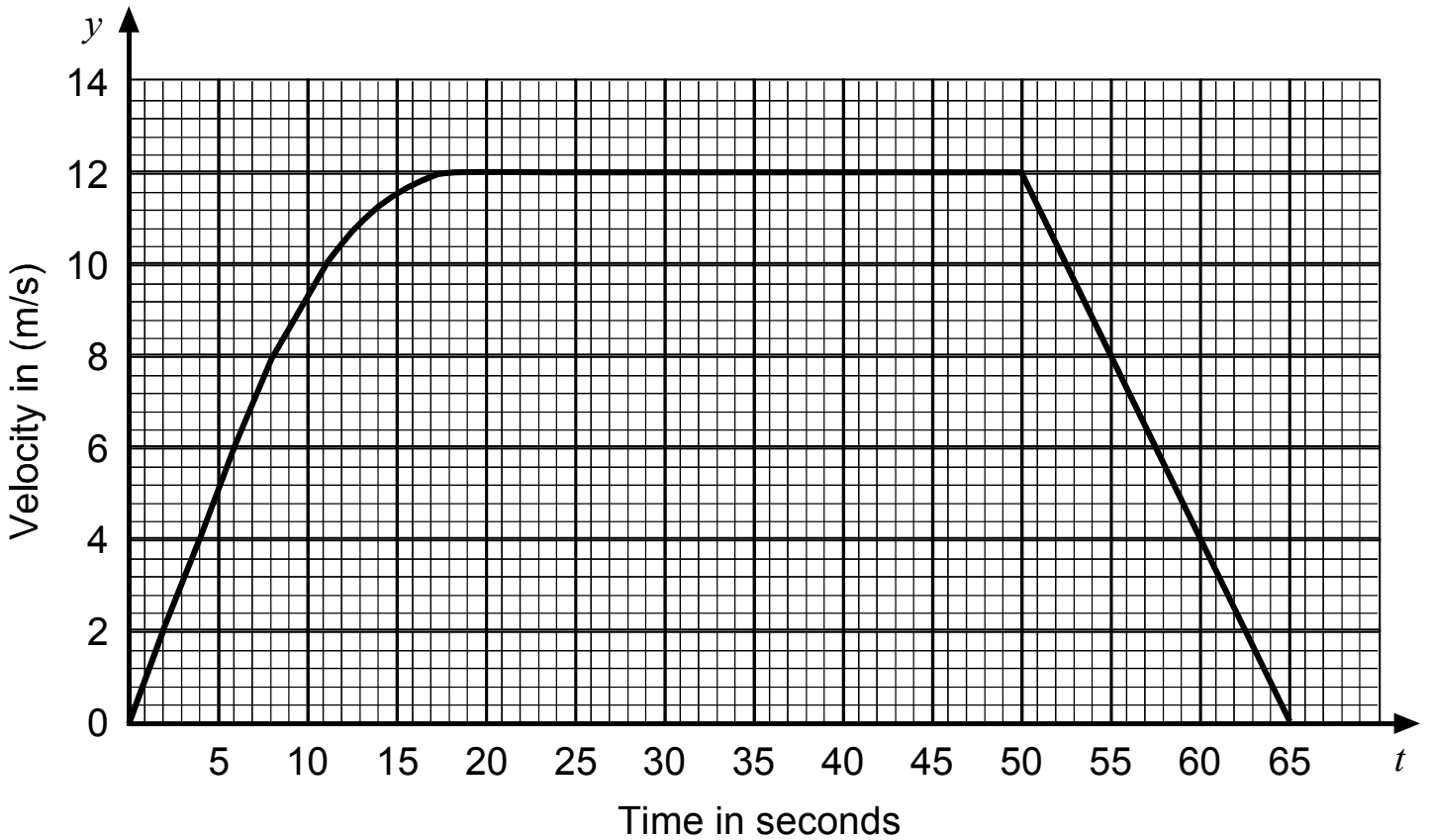
Information

- The marks for each question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

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.

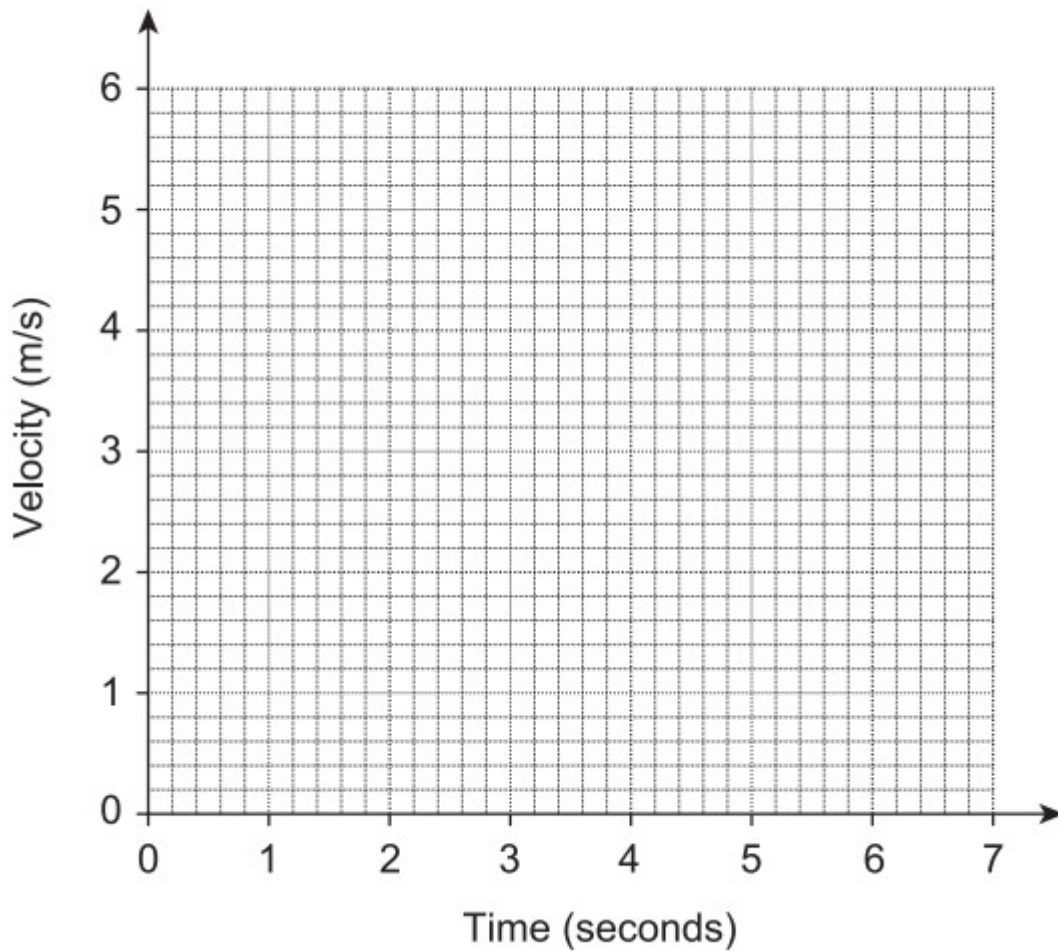
It moves in a straight line starting from rest.

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

It then slows down with constant deceleration of 1m/s^2 for 2 seconds.

It then hits a wall and stops.

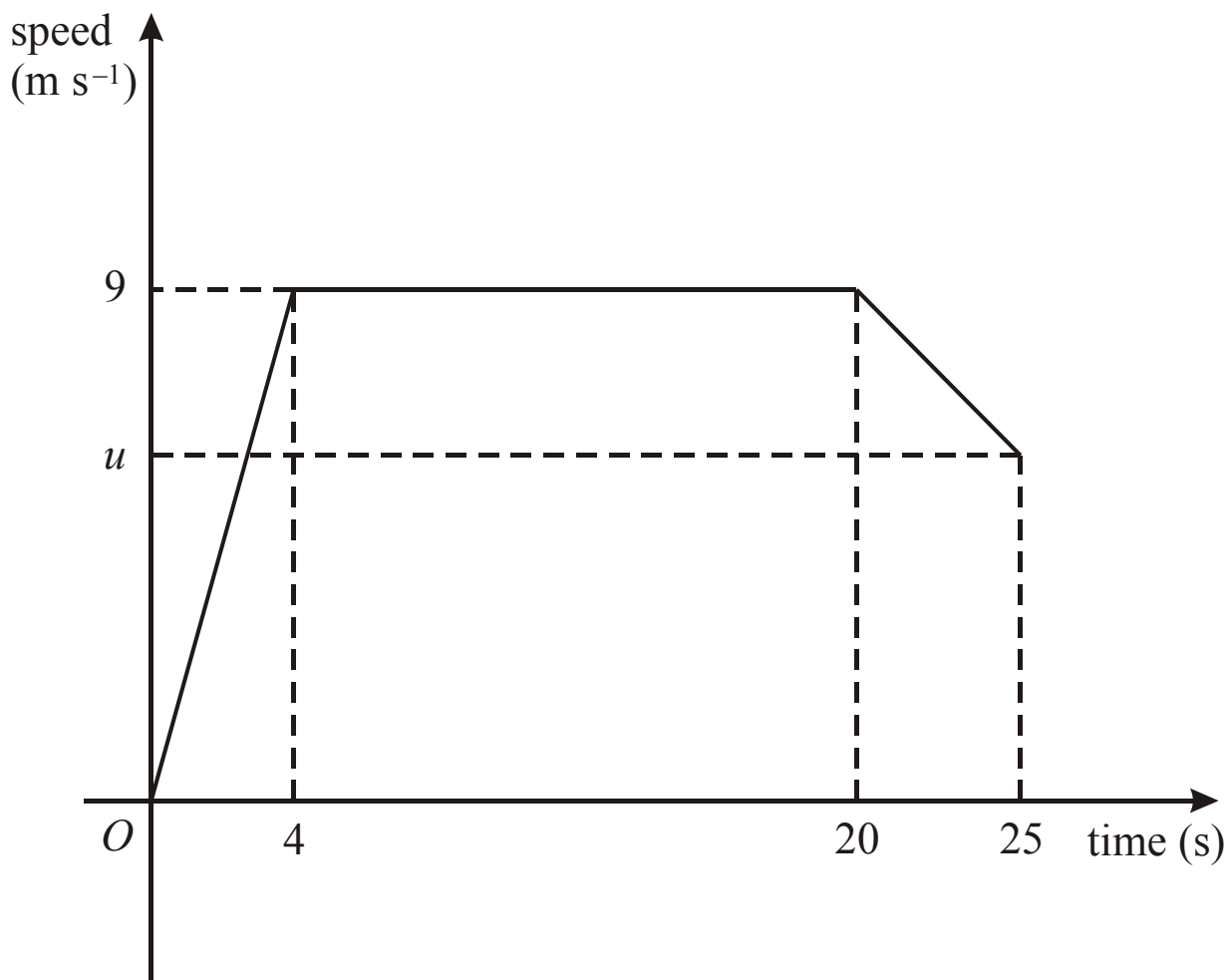
a) Draw a velocity-time graph for the toy car. (3)



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)

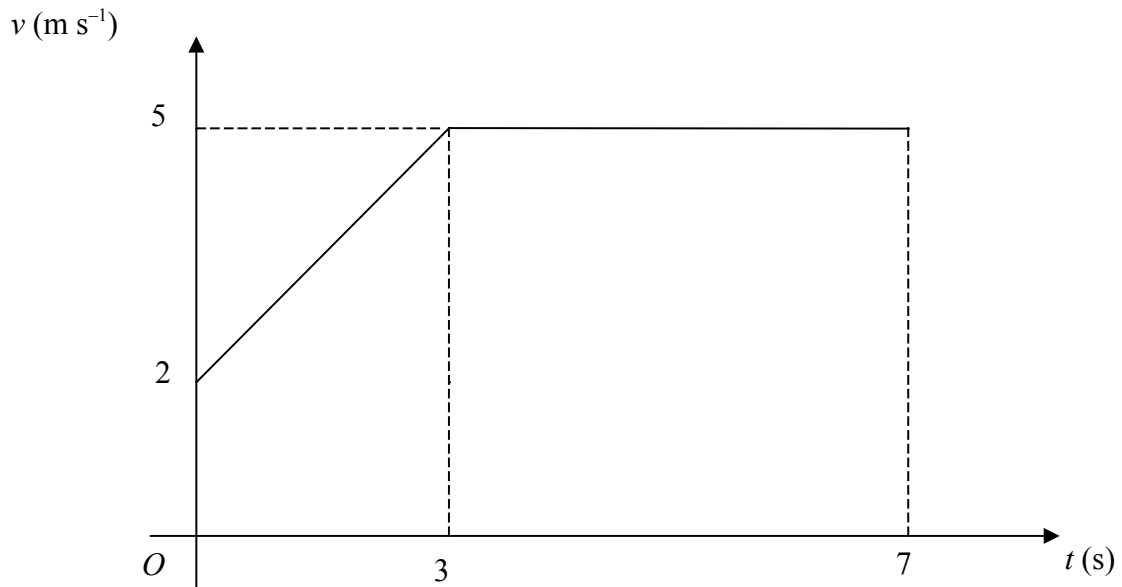
- b) The distance covered by the sprinter in the first 20 seconds of the race

..... (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:

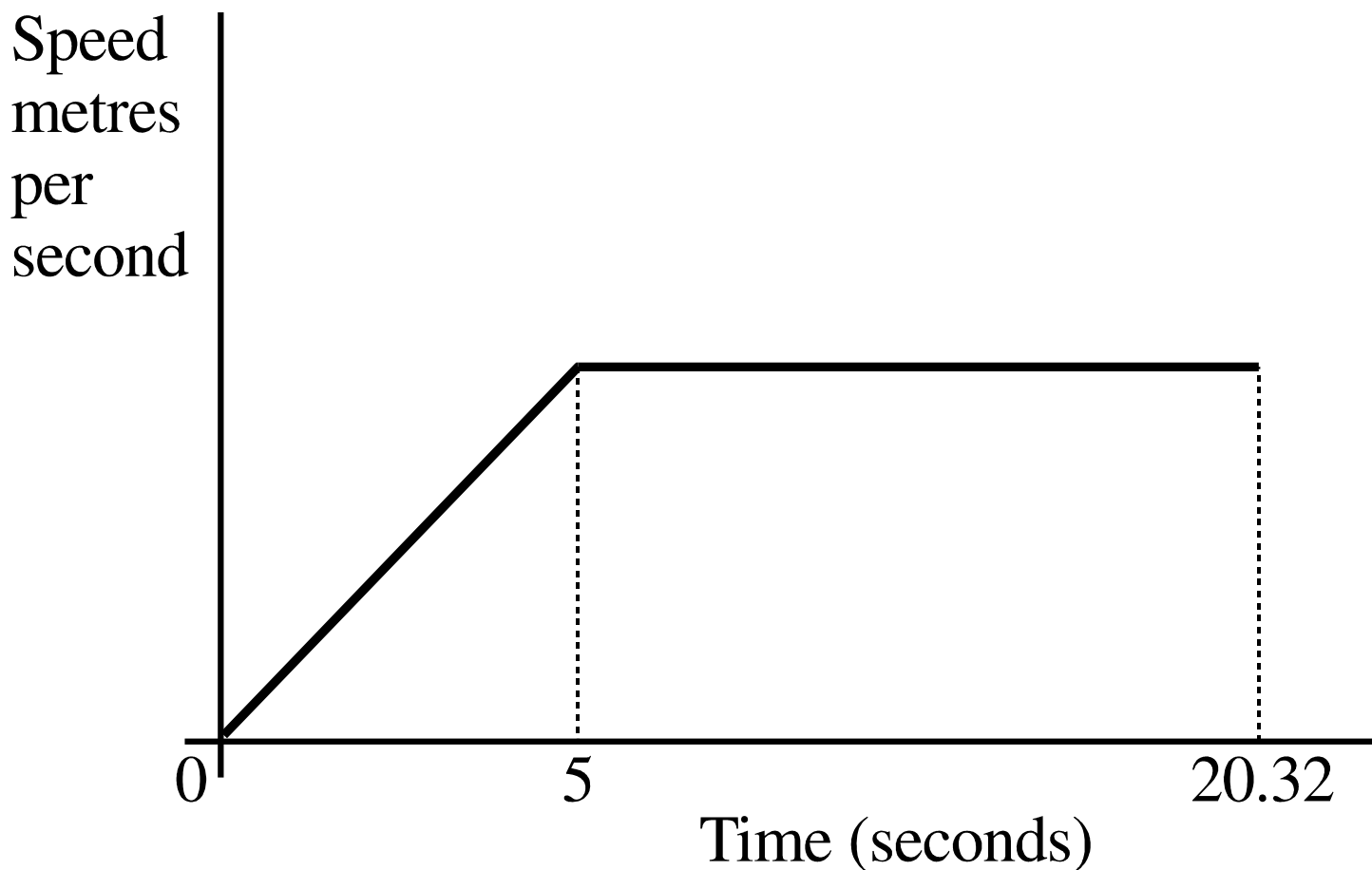
- a) The acceleration for the first 3 seconds

..... (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:

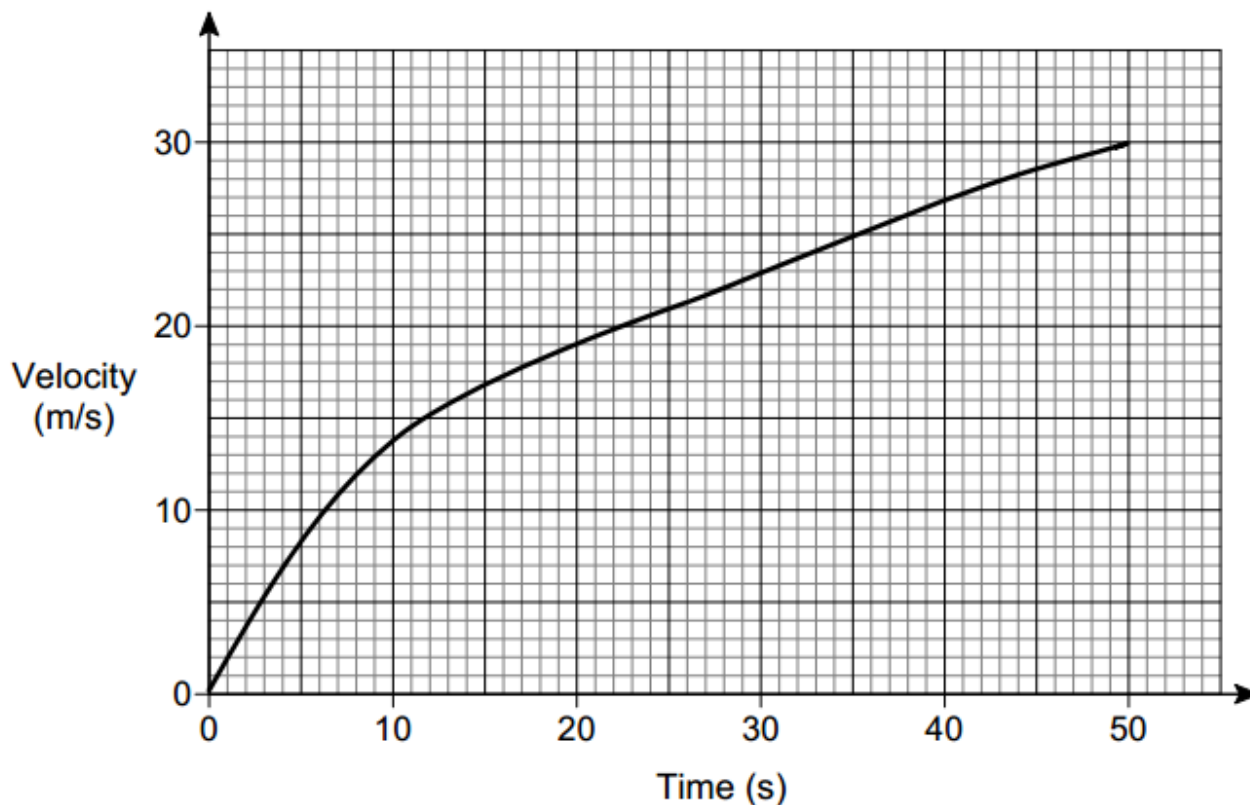
- a) The maximum speed of the sprinter during the race

..... (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)