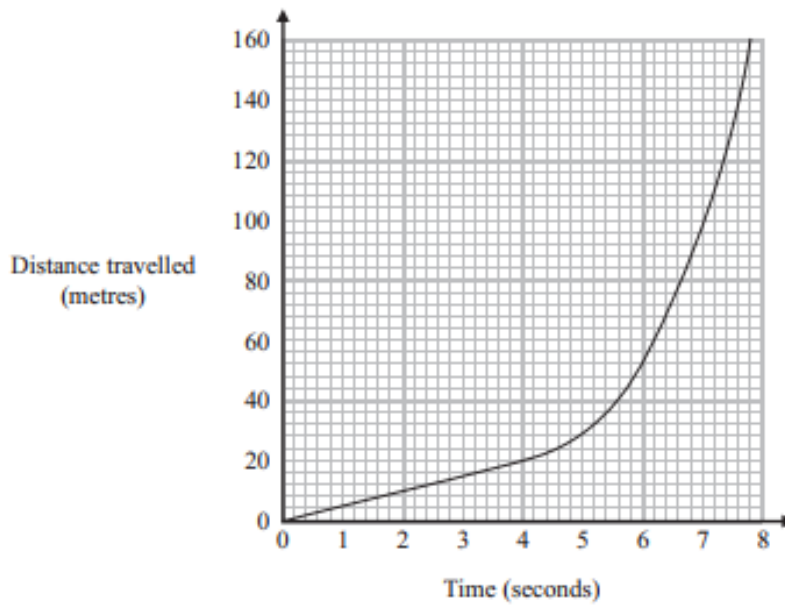**REAL LIFE AND DISTANCE – TIME GRAPHS**

Pearson Edexcel - Thursday 7 June 2018 - Paper 2 (Calculator) Higher Tier

1.

14 The distance-time graph shows information about part of a car journey.

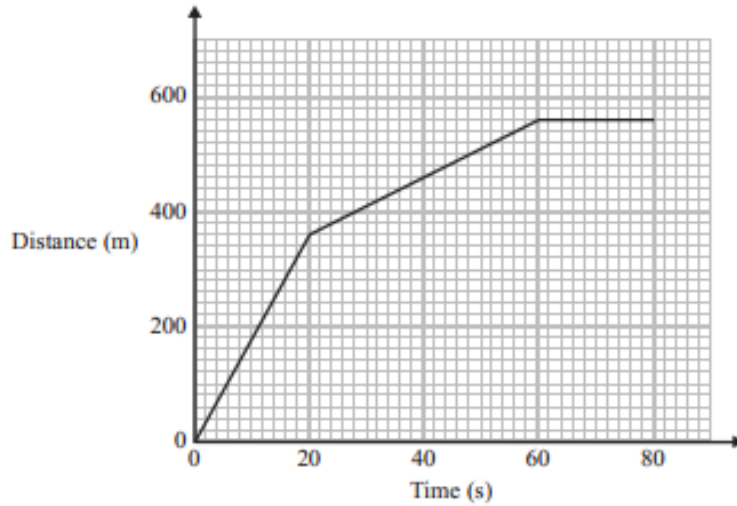Use the graph to estimate the speed of the car at time 5 seconds.

.... m/s

(Total for Question 14 is 3 marks)

Pearson Edexcel - Monday 6 November 2017 - Paper 2 (Calculator) Higher Tier

2.

10 Here is part of a distance-time graph for a car's journey.

(a) Between which two times does the car travel at its greatest speed?
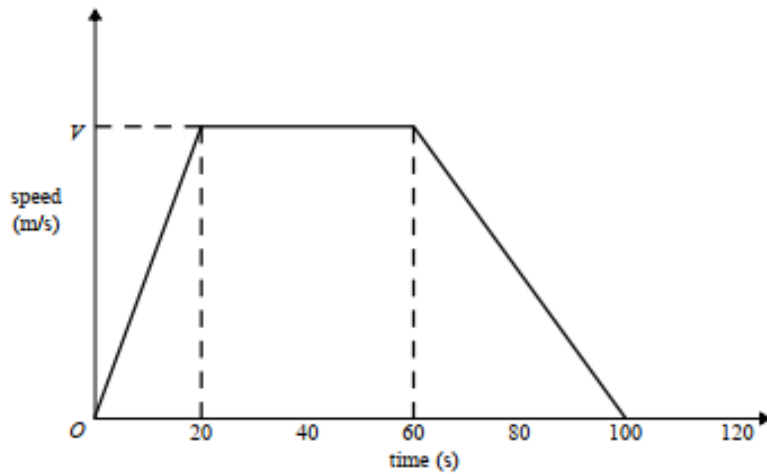Give a reason for your answer.

....

....

(2)

(b) Work out this greatest speed.

.... m/s

(1)

(Total for Question 10 is 3 marks)

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

3.

21 Here is a speed-time graph for a car journey.
The journey took 100 seconds.

The car travelled 1.75 km in the 100 seconds.

(a) Work out the value of V.

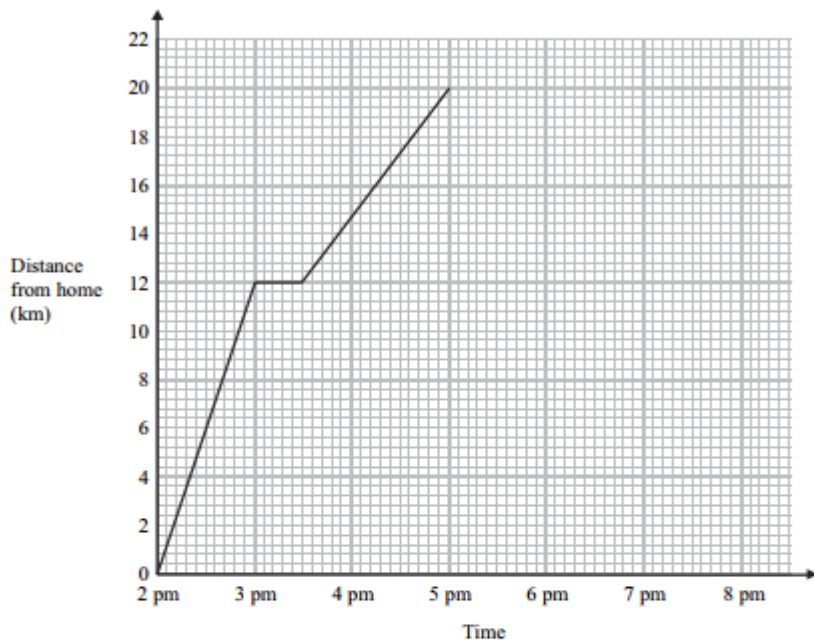.......................................
(3)

(b) Describe the acceleration of the car for each part of this journey.

....

....

....

....
(2)

(Total for Question 21 is 5 marks)

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

4.

3 Simon went for a cycle ride.
He left home at 2 pm.

The travel graph represents part of Simon's cycle ride.

At 3 pm Simon stopped for a rest.

(a) How many minutes did he rest?

.... minutes

(1)

(b) How far was Simon from home at 5 pm?

.... km

(1)

At 5 pm Simon stopped for 30 minutes.
Then he cycled home at a steady speed.
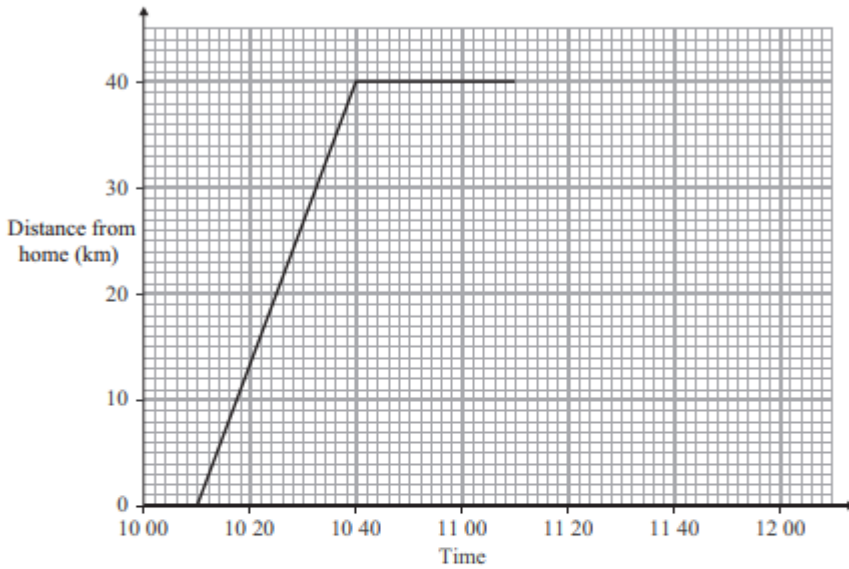It took him 1 hour 30 minutes to get home.

(c) Complete the travel graph.

(2)

(Total for Question 3 is 4 marks)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

5.

4. Nigel travelled from his home to his friend's house 40 km away.
   He stayed at his friend's house for 30 minutes.
   Nigel then travelled home.

   Here is part of the distance-time graph for Nigel's journey.

   (a) At what time did Nigel leave home?

   ....
   (1)

   (b) How far was Nigel from home at 10 20?

   .... km
   (1)

   Nigel arrived home at 11 50

   (c) Complete the distance-time graph.
   (1)

   (Total 3 marks)

OCR GSCE – Tuesday 3 November 2020 – Paper 4 (Calculator) Higher Tier

6.

19 (a) The graph shows the speed of a vehicle during the first 40 seconds of motion.
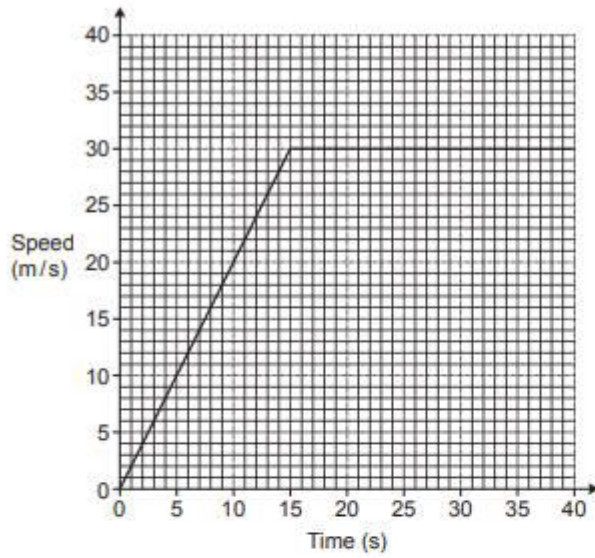
Calculate the distance travelled by the vehicle during the 40 seconds.

(a) .... m [3]

(b) The graph shows the distance travelled by a particle over 6 seconds.
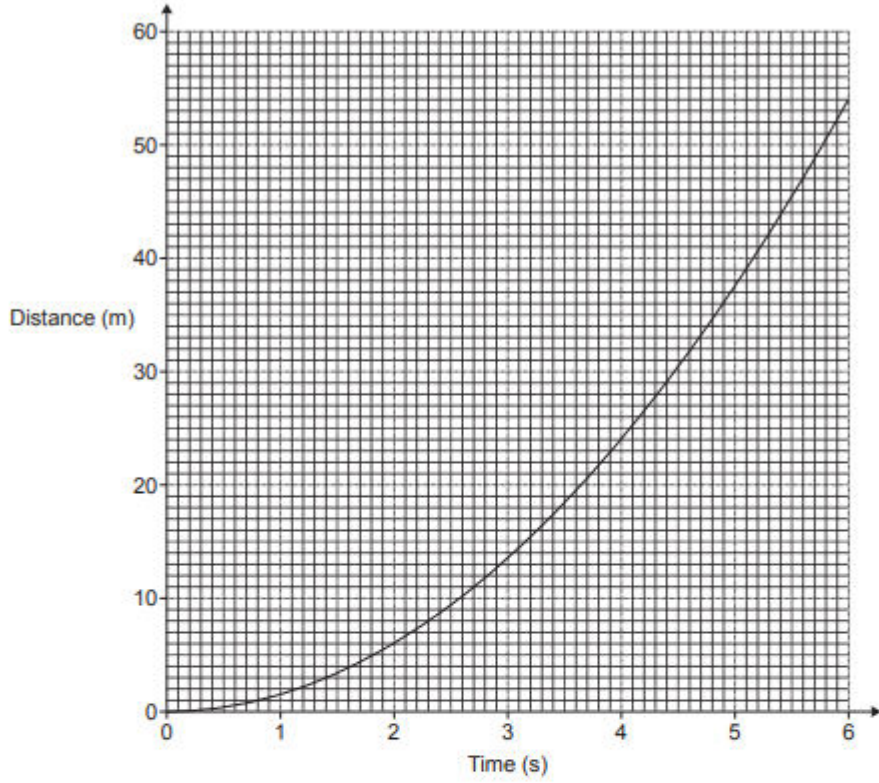
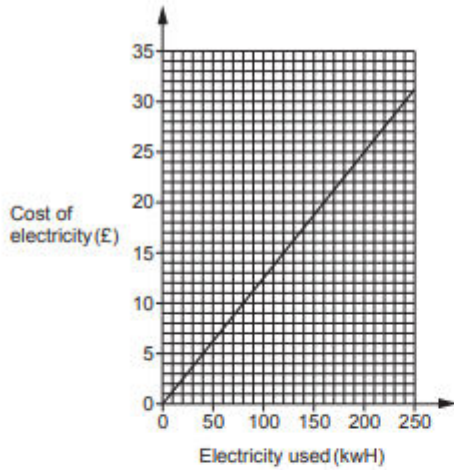**(i)** Work out the average speed of the particle between 2 and 4 seconds.

(b)(i) .... m/s **[2]**

(ii) Estimate the speed of the particle at 4 seconds.

(ii) .... m/s **[4]**

3   The graph shows the cost of electricity with Company A.

Electricity used (kwH)

(a)   Use the information in the graph to estimate the cost of electricity for a customer who uses 450 kwH of electricity.

(a)   £ .... [3]
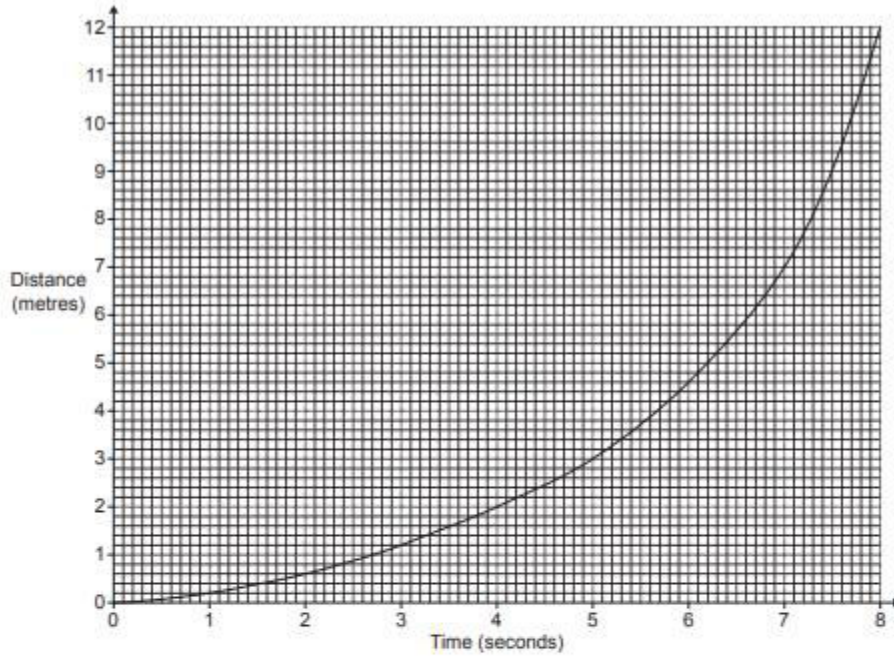
(b)   Company B charges 14.3 pence per kwH of electricity used.

If Company B's cost of electricity was plotted on the same axes as Company A's cost of electricity, which line would be steeper?
Explain how you know.

Company .... would have the steeper line because ....

....

.... [3]

8.

19 The graph shows the distance travelled by a particle over 8 seconds.

Estimate the speed of the particle at 5 seconds.

.... m/s [4]

9.

14 The graph shows the speed of a train during the first 60 seconds of motion.
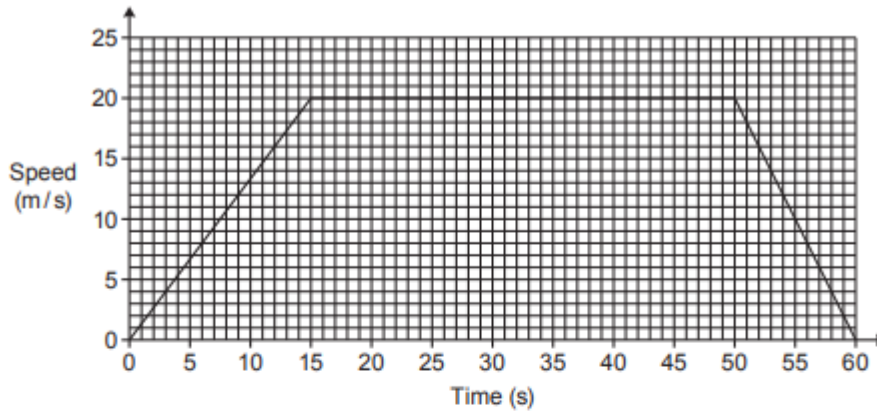
(a) What is the speed of the train after 9 seconds?

(a) .... m/s [1]

(b) What does the straight line suggest about the speed of the train over the first 15 seconds?

....

.... [1]

(c) Work out the average speed of the train, in m/s, during the 60 seconds.

(c) .... m/s [5]

8   The graph shows the speed of a cyclist during 20 seconds of a journey.
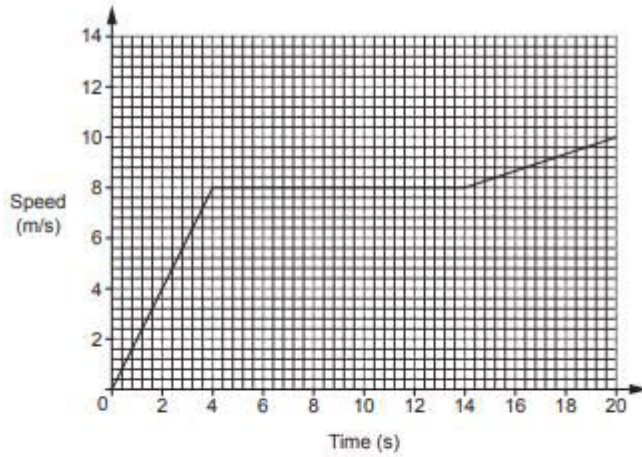
(a) Find the acceleration of the cyclist

(i)   for the first 4 seconds

(a)(i)   .... m/s² [2]

(ii)   between 4 seconds and 14 seconds.

(ii)   .... m/s² [1]

(b) Work out the distance travelled by the cyclist during the 20 seconds.

(b)   .... m [4]

OCR GSCE – Tuesday 12 June 2018 – Paper 6 (Calculator) Higher Tier

11.

8 The graph shows the speed of a tram as it travels from the library to the town hall.
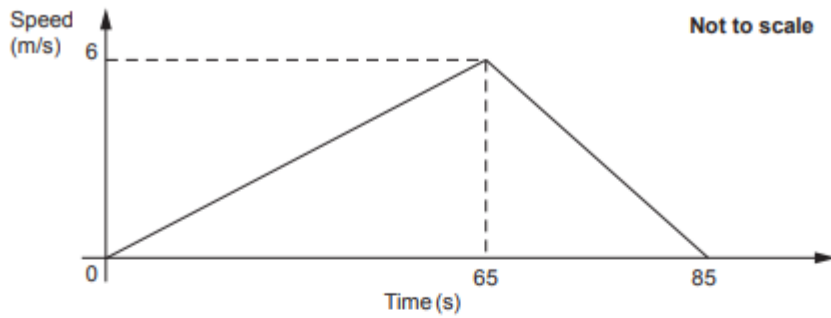
(a) Calculate the deceleration of the tram as it approaches the town hall.

(a) .... m/s² **[2]**

(b) Calculate the distance travelled by the tram between the library and the town hall.

(b) .... m **[3]**

(c) What was the maximum speed of the tram as it travelled between the library and the town hall?
Give your answer in **kilometres per hour**.

(c) .... km/h **[4]**

13 The graph shows information about the speed of a vehicle during the final 50 seconds of a journey.
At the start of the 50 seconds the speed is k metres per second.
The distance travelled during the 50 seconds is 1.35 kilometres.
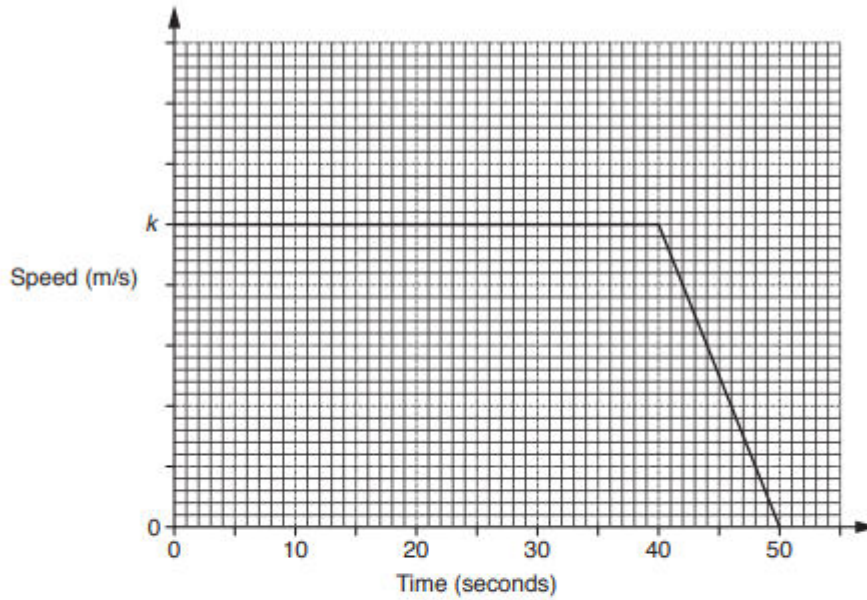
(a) Work out the average speed of the vehicle during the 50 seconds.
Give your answer in metres per second.

(a) .... m/s [2]

(b) Work out the value of k.

(b) $k =$ .... [5]

(c) (i) Calculate the gradient of the graph in the final 10 seconds of the journey.

(c)(i) .... [1]

(ii) Describe what this gradient represents.

....

.... [2]

OCR GSCE – Thursday 25 May 2017 – Paper 4 (Calculator) Higher Tier

13.

15 The graph shows the speed, v metres per second (m/s), of a car at time t seconds.
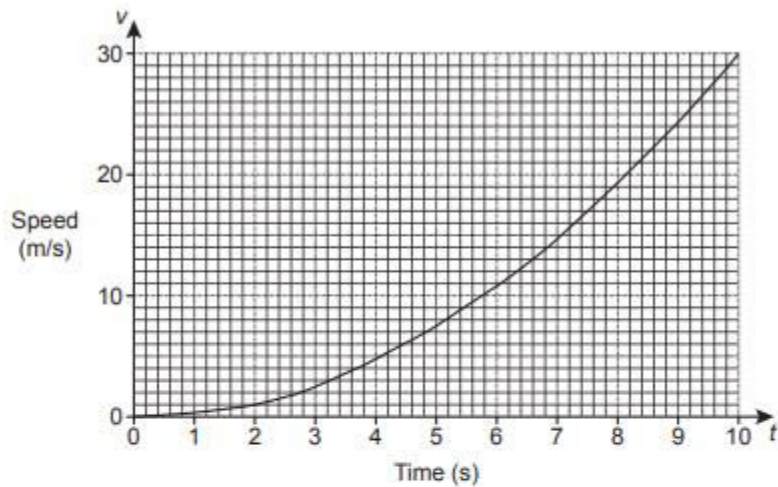
(a) Find the speed of the car at $t = 7$.

(a) .... m/s [1]

(b) It is claimed that the car has accelerated from 0 to 60 miles per hour in the first 10 seconds.

Does the graph support this claim? Show your reasoning.
Use 1 mile = 1.6 kilometres. [5]

(c) Use the graph to estimate the acceleration at $t = 7$.

(c) .... m/s^2 **[3]**

(d) The speed of this car is directly proportional to the square of the time.

Find a formula linking v and t.

(d) .... **[3]**

(e) Georgina says that the graph shows that the speed of the car will continue to increase after 10 seconds.

Make one comment to show that this statement is incorrect.

....

....

.... **[1]**

14.

20   The graph shows the speed, in metres per second, of a particle over the first four seconds of motion.
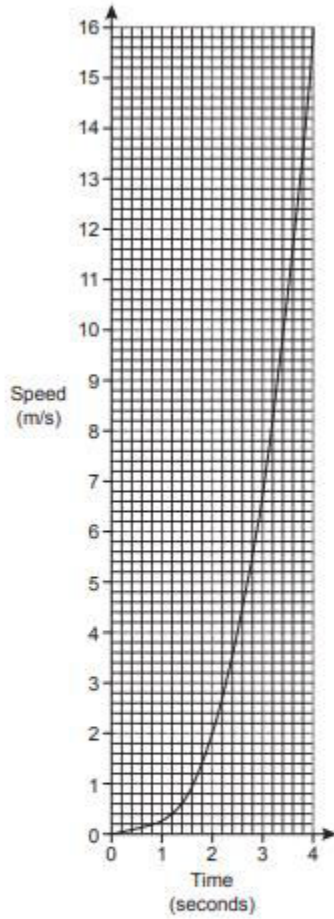
Use the graph to estimate the distance travelled by the particle in the four seconds.

.... metres [2]

2   The graph shows Mia's journey from her home to university.
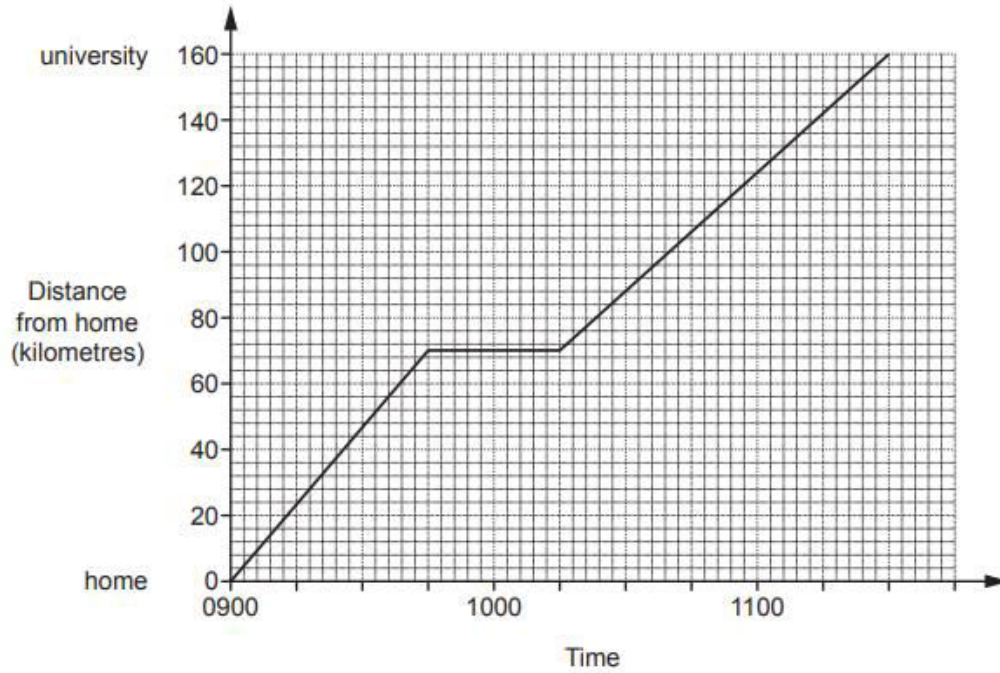
Calculate Mia's average speed for the whole journey.

.... km/h [3]

16.

11 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 5 m/s.
It then slows down with constant deceleration of 1 m/s² for 2 seconds.
It then hits a wall and stops.

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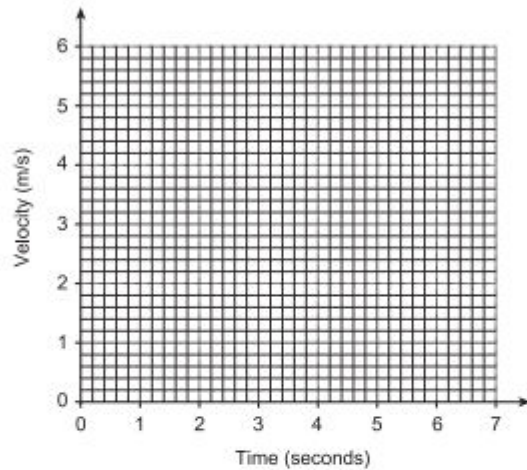
[3]

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

(b) .... m [3]

17.

10 The graph shows the distance travelled by an animal over 12 seconds.
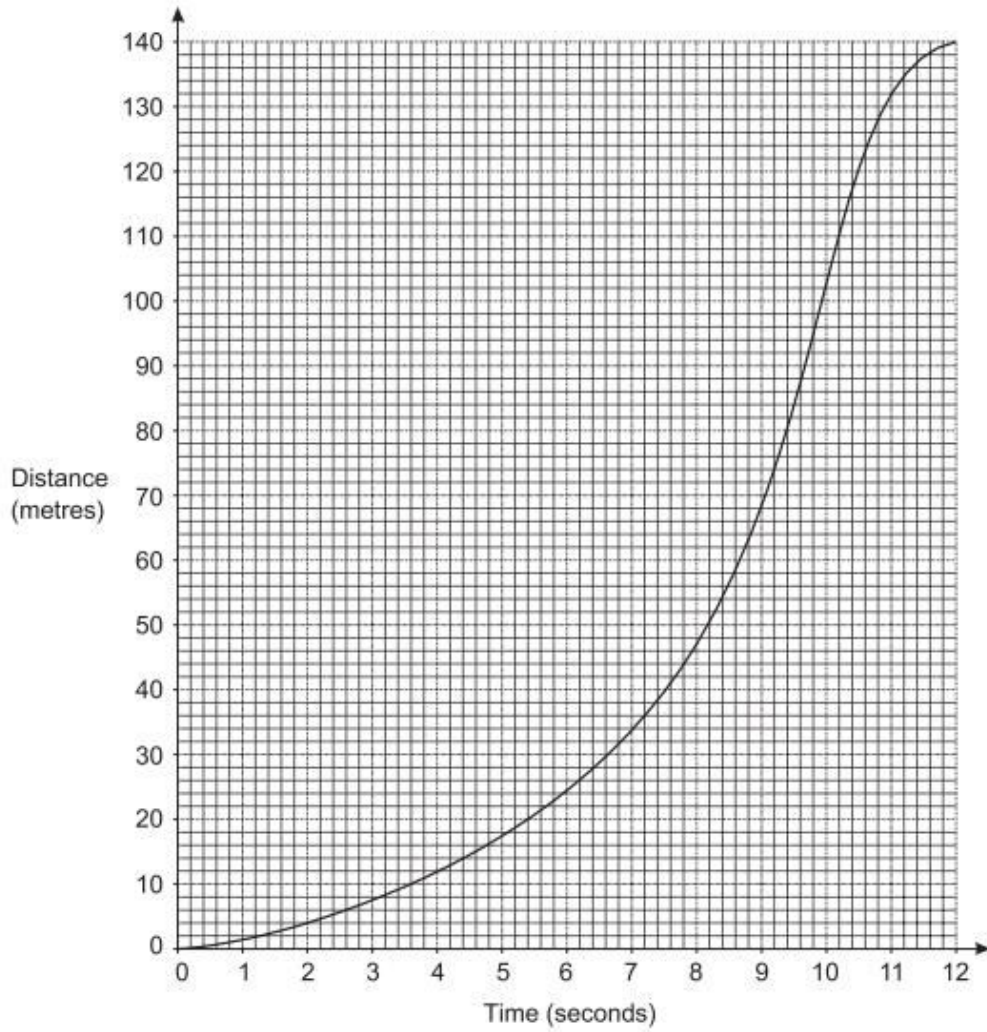
(a) Work out the average speed between 2 and 8 seconds.

(b) Estimate the speed of the animal at 6 seconds.

(b) .... m/s **[4]**

(c) Nuri says

I think this animal must be able to move at over 20 m/s!

Do you agree with Nuri?
Explain your decision.

....

.... [2]

AQA GSCE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

18.

28   A horse runs in a field.
      The speed-time graph represents the first 12 seconds of the run.
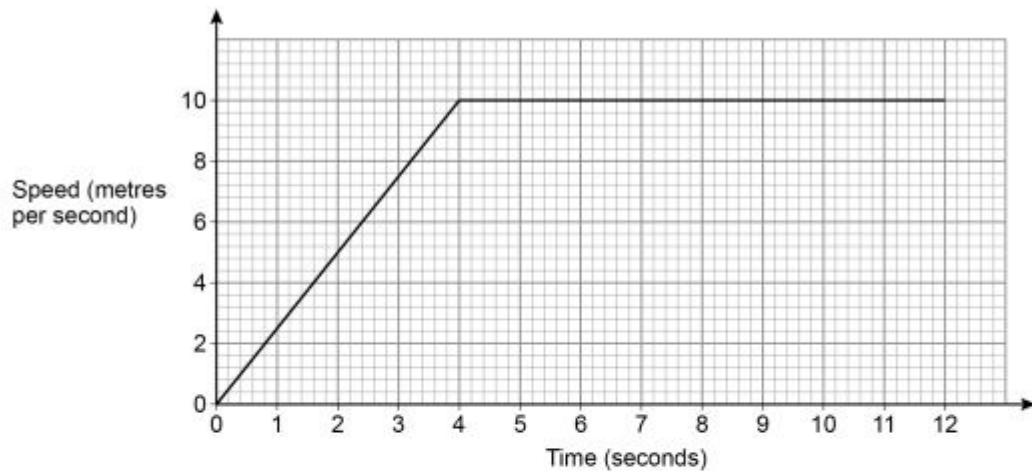
After how many seconds had the horse run a distance of 75 metres?

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____ seconds

8   Chris visits a library.

He cycles to the library in half an hour at a speed of 12 miles per hour.

He stays at the library for one hour.

He then cycles home.

The sketch graph represents his visit.
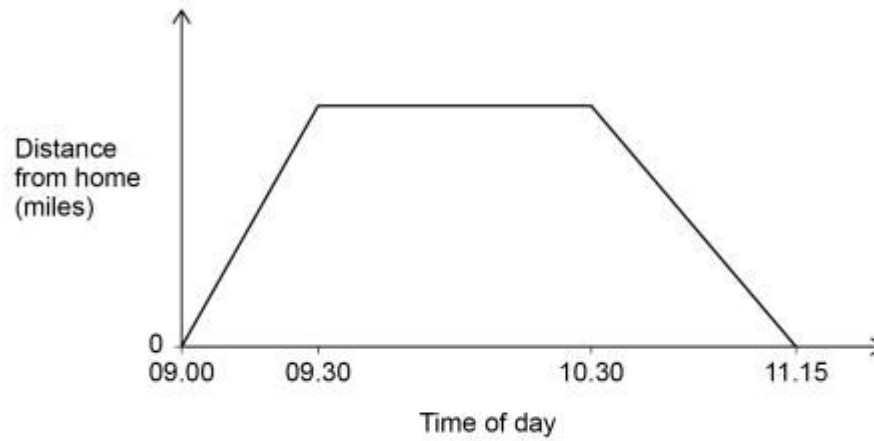
Work out the speed, in miles per hour, at which Chris cycles home.

[3 marks]

Answer _____ mph

20.

28   Leo runs for 12 seconds.
         The graph shows his speed.
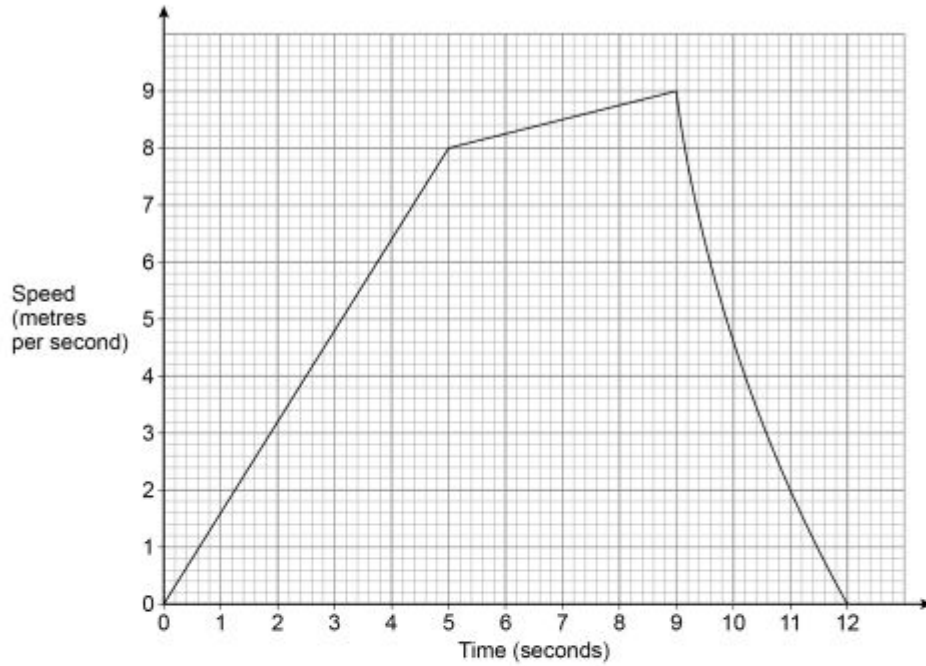
28 (a)   Show that the distance he runs is less than 67.5 metres.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

_____

28 (b) Work out his average acceleration for the first 9 seconds.

State the units of your answer.

[2 marks]

_____

_____

Answer _____

6   A ship is sailing in a straight line from its home port.
        The distance-time graph shows 4 hours of the journey.
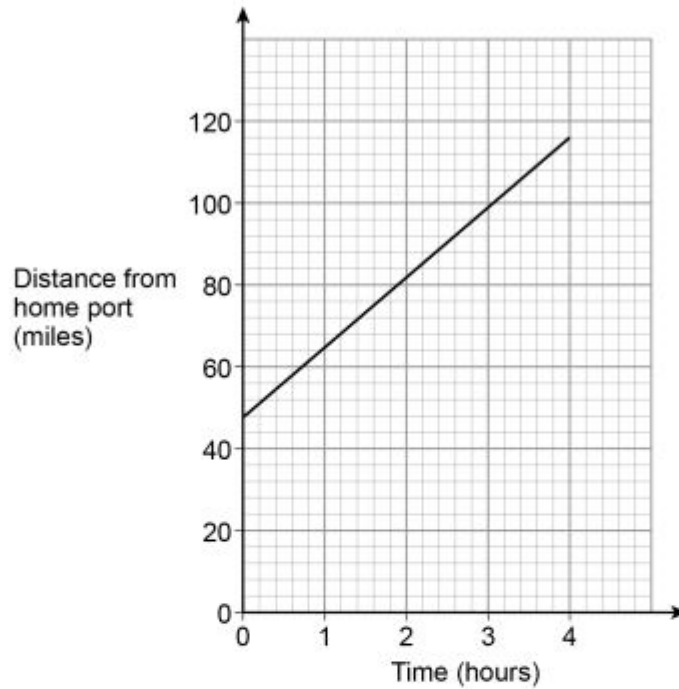
Work out the speed of the ship during these 4 hours.

[3 marks]

_____

_____

_____

_____

_____

        Answer _____ mph

28   Izzy runs an 80-metre race in 14 seconds.

During the first 6 seconds her speed increases at a constant rate.
During the last 8 seconds her speed increases at a different constant rate.
Her speed at 14 seconds is 2 m/s more than her speed at 6 seconds.

Here is a sketch of her speed-time graph.

Not drawn accurately
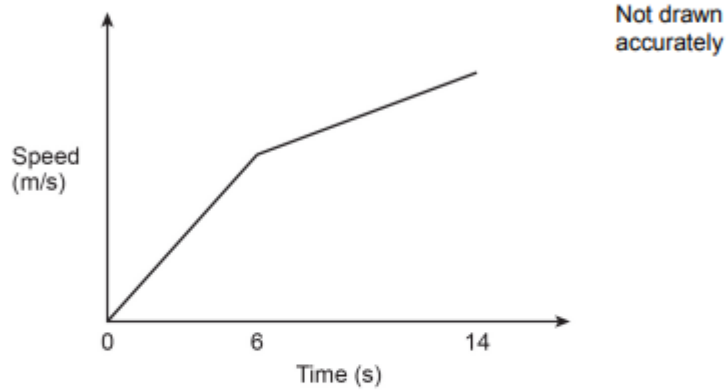
28 (a)   Work out her acceleration during the last 8 seconds.
State the units of your answer.

[2 marks]

_____

_____

Answer _____

28 (b)   When Izzy finishes the 80-metre race, her speed is v m/s

Work out the value of v.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____

17   A ball is thrown vertically upwards.

The graph shows the height of the ball above the ground after it is thrown.
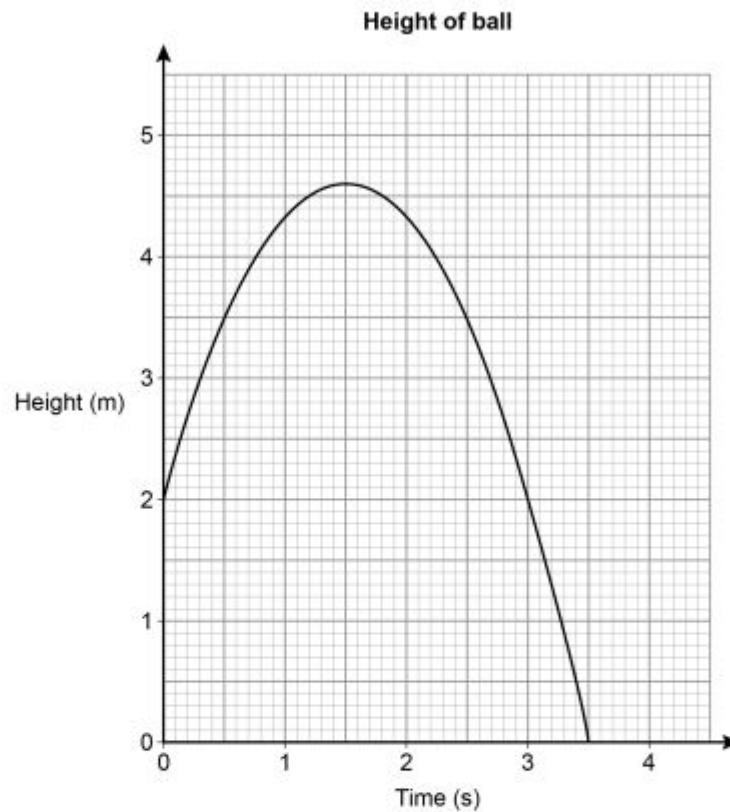
Height of ball

17 (a)   For how many seconds is the ball at a height of **more than** 2 metres?

[1 mark]

Answer _____ s

17 (b)   After how many seconds is the ball at instantaneous rest when it is in the air?

[1 mark]

Answer _____ s

17 (c) Work out the average speed of the ball when it is moving downwards.

[2 marks]

_____

_____

_____

Answer _____ m/s

AQA GSCE – Tuesday 12 June 2018 – Paper 3 (Calculator) Higher Tier

24.

24   The speed-time graph shows 20 seconds of a car journey.

Harry wants to estimate the distance the car travels in this time.

He uses a triangle and a trapezium, as shown, to estimate the area under the graph.

Car journey
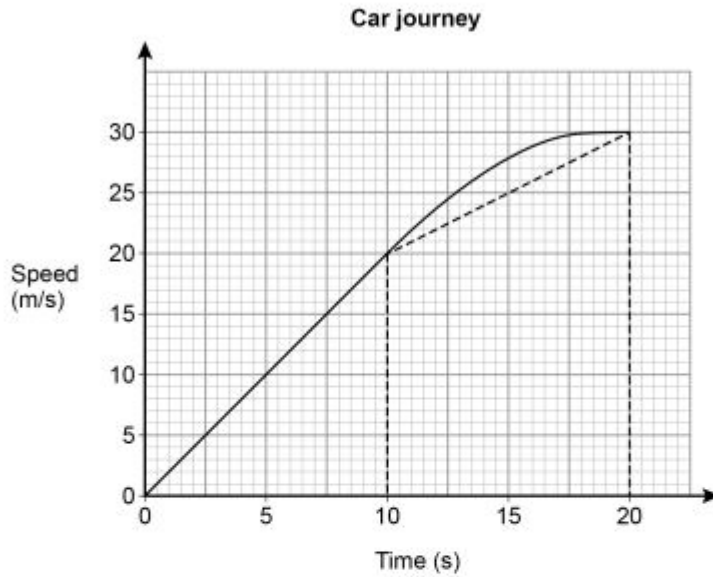
24 (a)   Complete Harry's method to estimate the distance the car travels.

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____ m

24 (b) For this journey, which of these is true for Harry's method?

Tick **one** box.

[1 mark]

☐ It works out an overestimate of the distance

☐ It works out an underestimate of the distance

☐ It could work out an overestimate or an underestimate of the distance

AQA GSCE – Thursday 2 November 2017 – Paper 1 (Non - Calculator) Higher Tier

25.

16 Water is poured into a tank.

The graph shows the number of litres of water in the tank.
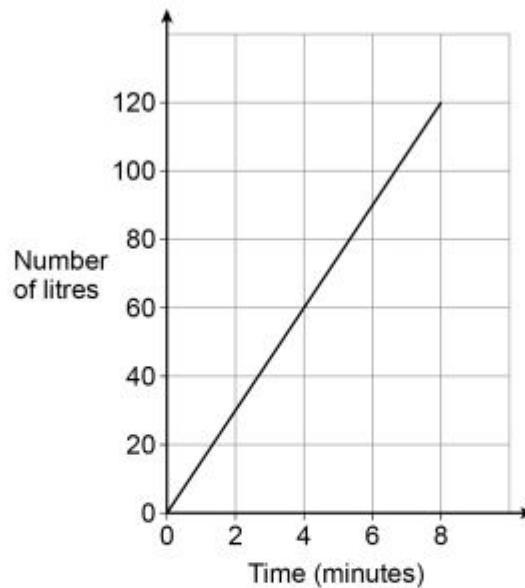
How much water is poured into the tank each minute?

Circle your answer.

[1 mark]

1.5 litres   15 litres   30 litres   120 litres

24   Beth ran a 200 metre race.

Here is a graph of the first 8 seconds of her race.

She completed the race at a constant speed of 9 m/s

Speed-time graph for Beth
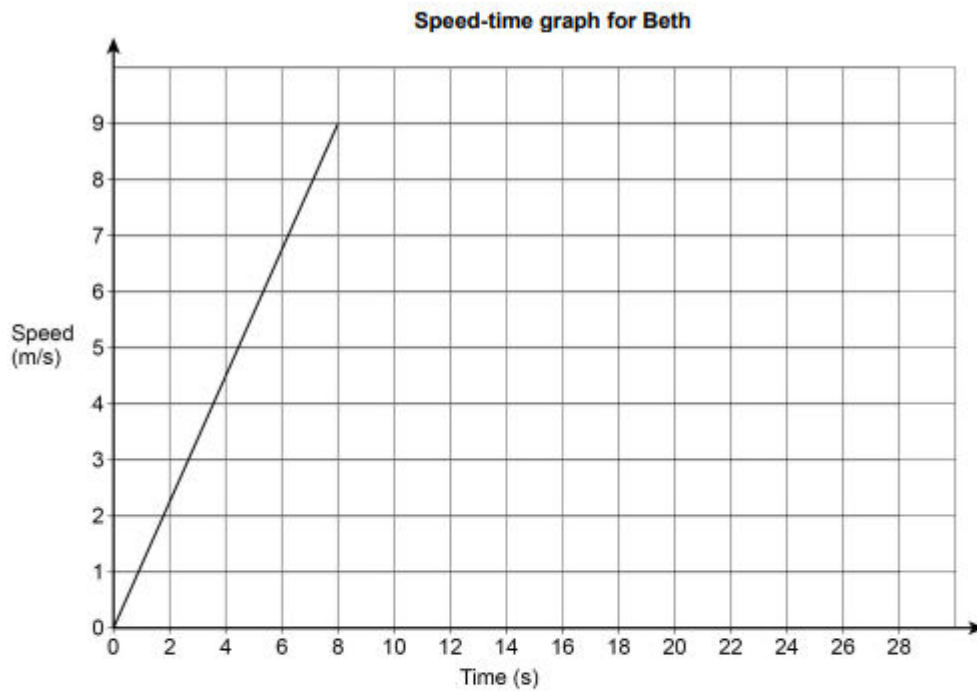
Amy completed the race in 27 seconds.

Did Beth finish before Amy?

You **must** show your working.

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____

27.

25 Liquid is leaking out of a container.

The graph shows the depth of the liquid for 60 seconds.
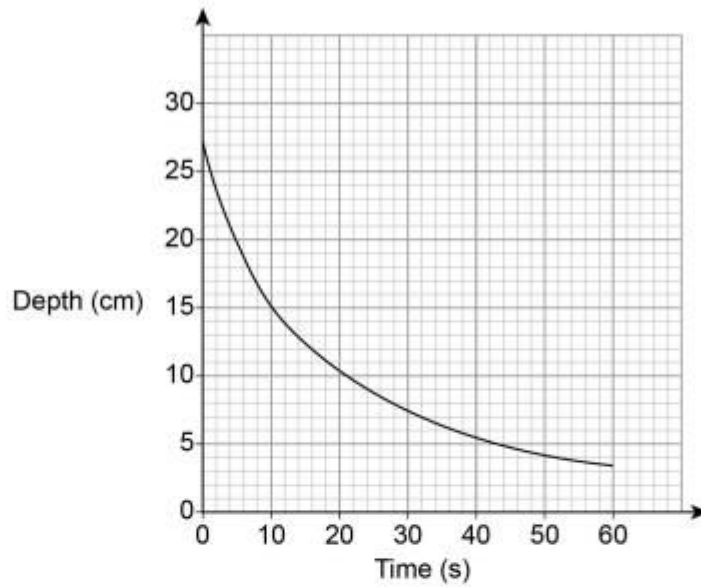
Use the graph to work out an estimate of the rate of decrease of depth at 10 seconds.

You **must** show your working.

[3 marks]

_____

_____

_____

_____

_____

Answer _____ cm/s

23   Here is a velocity-time graph of a motorbike for 25 seconds.
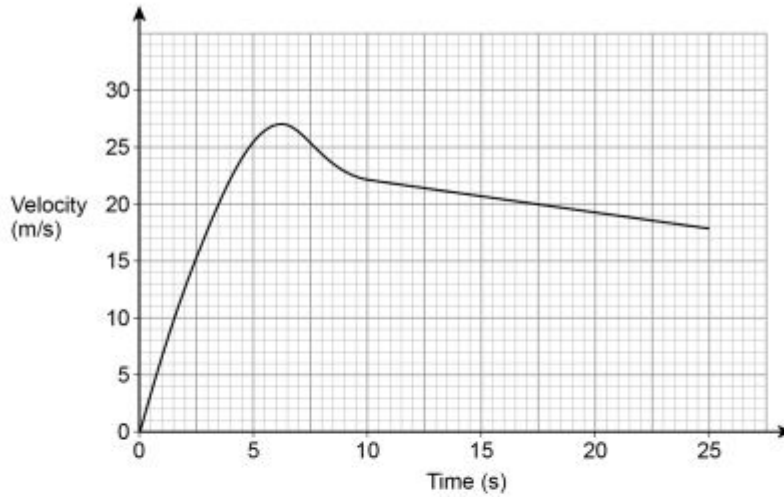
23 (a)   After how many seconds was the acceleration zero?

[1 mark]

Answer _____ seconds

23 (b)   Work out the distance travelled in the last 15 seconds.

[2 marks]

_____

_____

_____

_____

Answer _____ metres

8   Lily goes on a car journey.

For the first 30 minutes her average speed is 40 miles per hour.

She then stops for 15 minutes.

She then completes the journey at an average speed of 60 miles per hour.

The total journey time is 1 hour.

8 (a)   Draw a distance-time graph for her journey.

[3 marks]
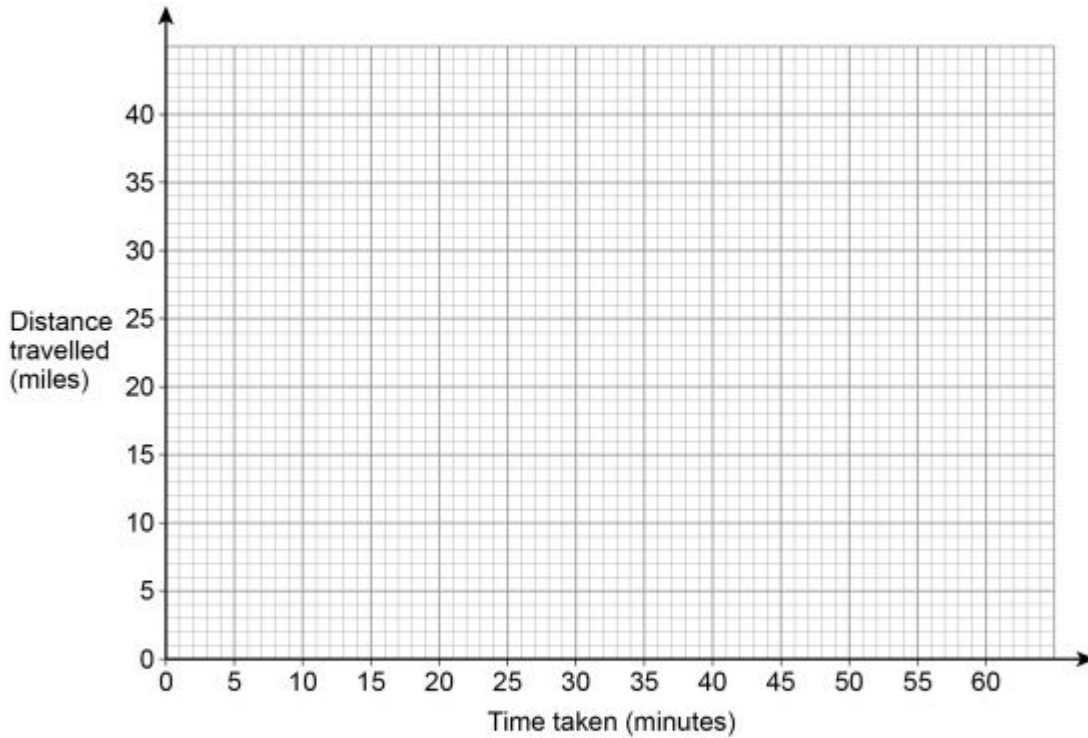
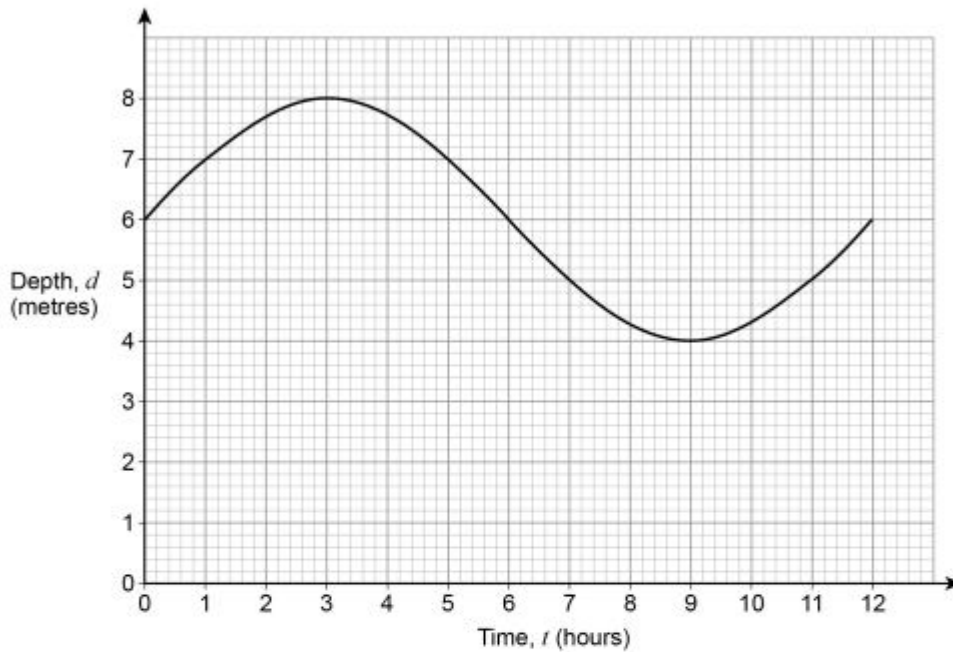8 (b)   Write down the average speed for the total journey.

[1 mark]

_____

Answer _____ mph

15 The graph shows the depth of water in a harbour for 12 hours.

d is the depth of water in a harbour in metres

t is the number of hours after 9 am

15 (a) For how many of the 12 hours is the depth more than 5 metres?

[1 mark]

Answer _____

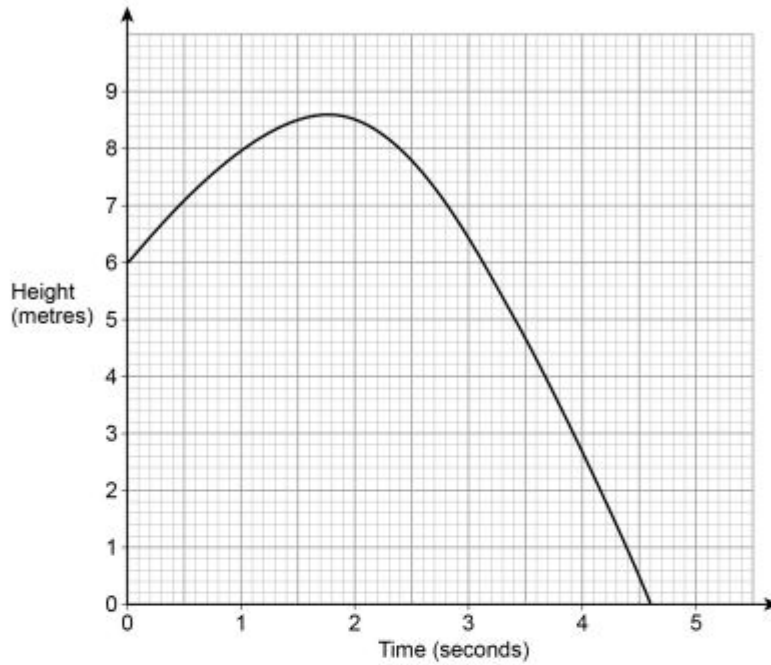**15 (b)** By how much does the depth change between 12 noon and 4 pm?

[1 mark]

Answer _____ metres

31.

24   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.

[2 marks]

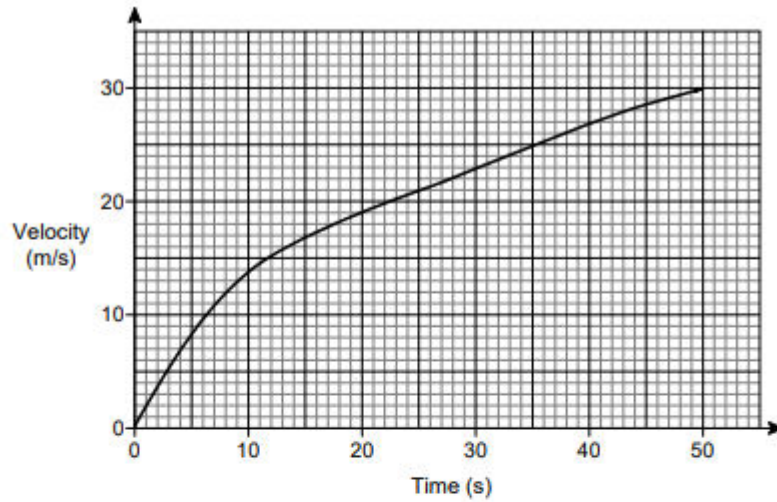Answer _____ m/s

32.

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

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

Give the units of your answer.

[2 marks]

_____

_____

_____

Answer _____

24 (b)   Estimate the time during the 50 seconds when

the instantaneous acceleration = the average acceleration

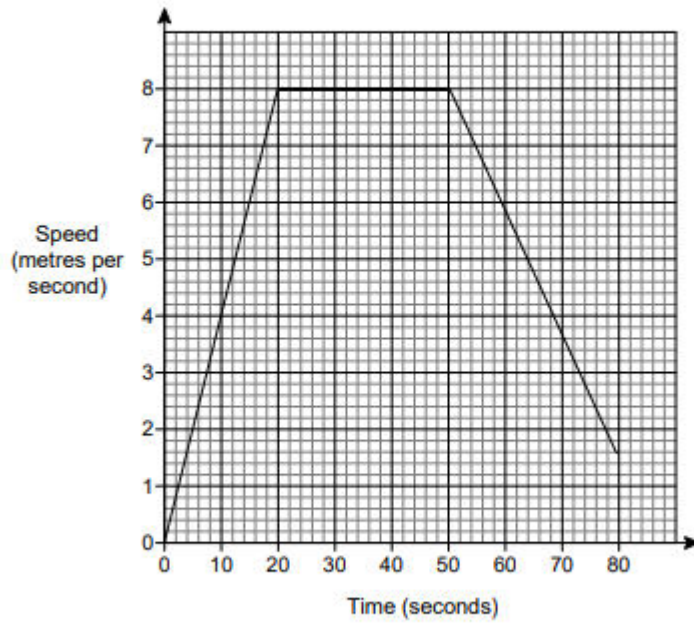You **must** show your working on the graph.

[2 marks]

_____

Answer _____ seconds

33.

24   Amina and Ben had a cycle race.

Here is Amina's speed-time graph from the start of the race.

24   The distance of the race was 400 metres.

Ben cycled the 400 metres in 64 seconds.

Who won the race?

You **must** show your working.

[4 marks]

_____

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____