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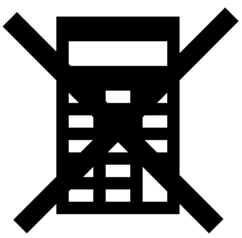
AQA, OCR, Edexcel

GCSE

GCSE Maths

Velocity-Time Graphs

Name:

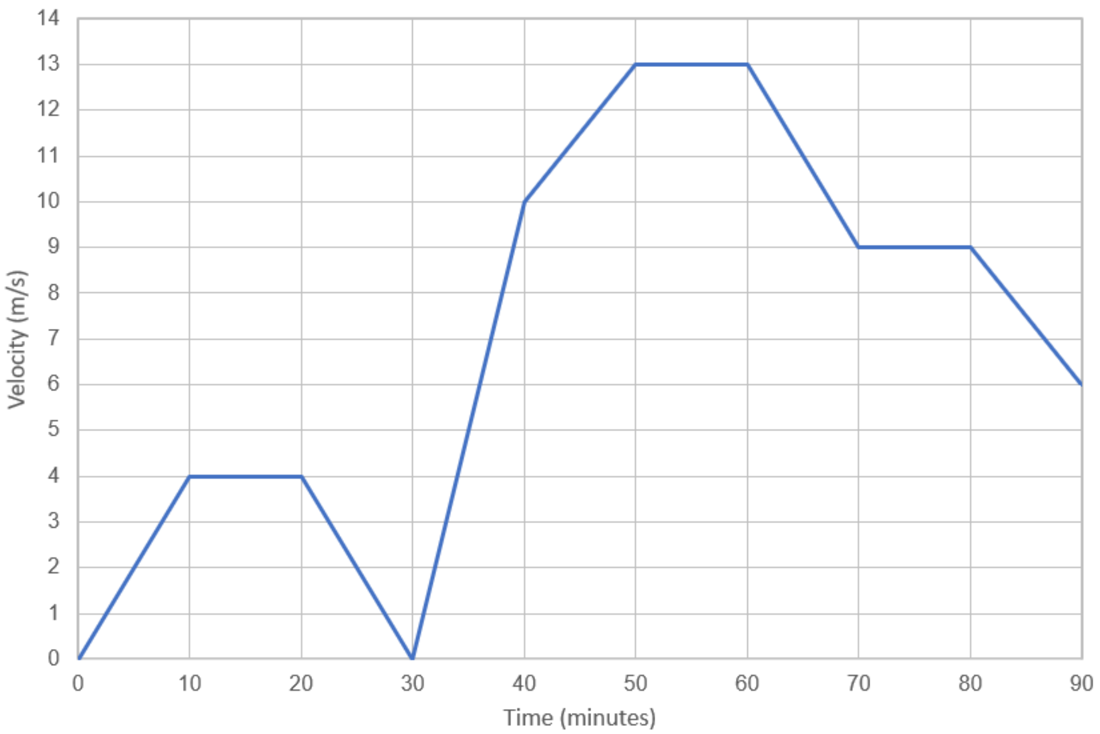


Guidance

1. Read each question carefully.
2. Don’t spend too long on each question.
3. Attempt every question.
4. Always show your workings.

Revise GCSE Maths:
www.MathsMadeEasy.co.uk/gcse-maths-revision/

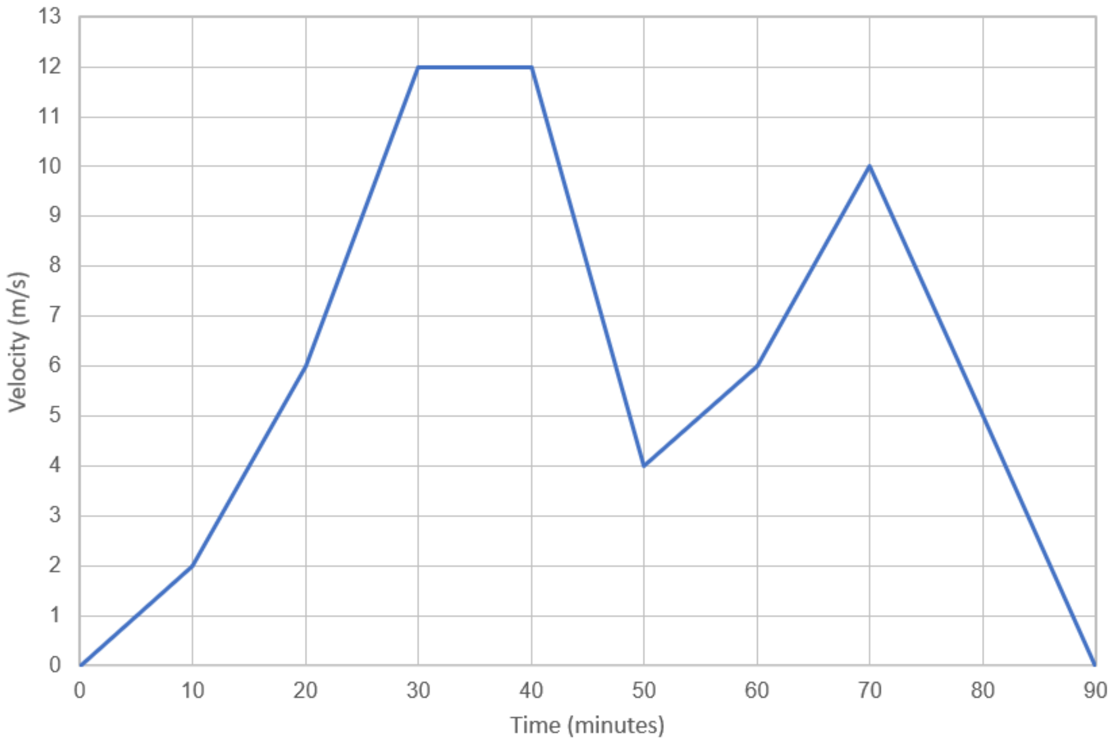
1. Anna goes out for a drive and her journey is shown on the velocity-time graph below. For each statement, write a time or period that satisfies this condition. i.e t = 0, or t = 0 to 10.



- Anna is at rest …………
- Anna's velocity is constant …………
- Two sections with the same speed …………
- Two sections with the same acceleration …………
- The section with the highest acceleration …………
- The section with the highest velocity …………

(5 marks)

2. The velocity-time graph below shows Brian's daily journey.



a) What is Brian's largest positive acceleration over the course of the journey?

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acceleration = ………… m/s^2

b) <u>Estimate</u> the total distance travelled by Brian over the course of the journey.

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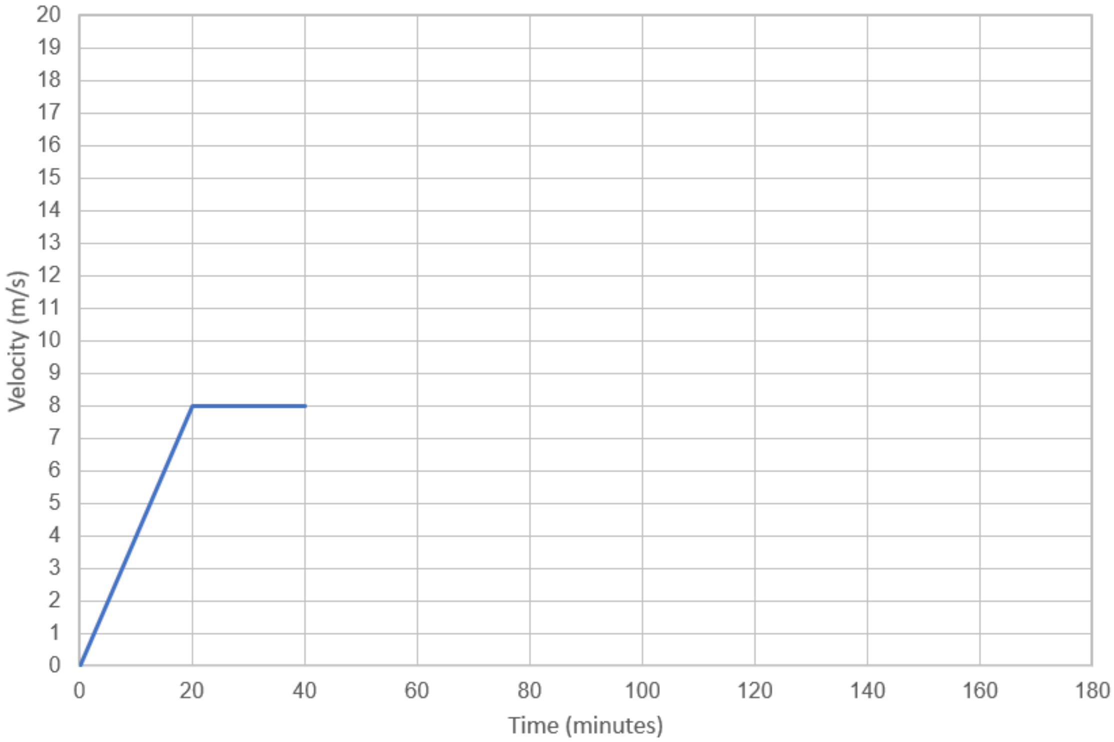
distance = ………… m

(2 marks & 4 marks)

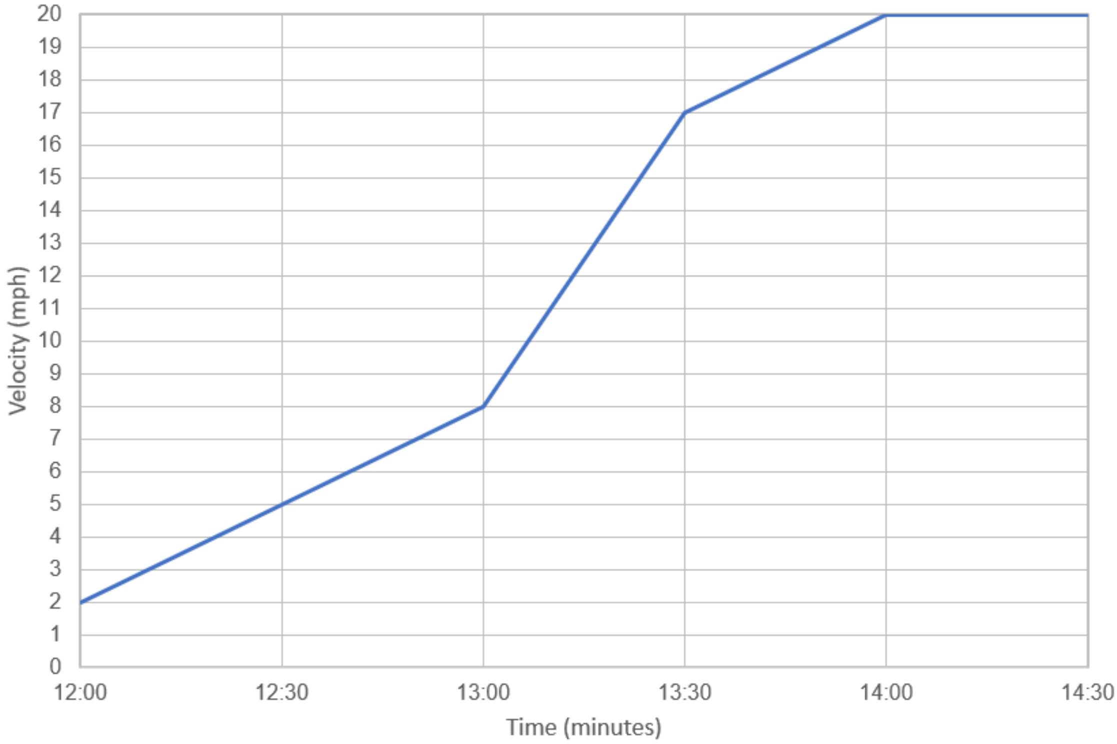
3. Using the information below, complete the velocity-time diagram for Celica's journey.



- By the 60-minute mark, Celica has travelled 24km total
- After this she increases velocity to 14m/s over 40 minutes
- She then maintains her velocity for 20 minutes before decelerating for 60 minutes at the same rate as her acceleration between 60-100 minutes.

(4 marks)

4. Diane goes out cycling for a 150-minute journey, and her progress is displayed in the velocity-time graph below.



She looks at the graph and makes a calculation. She states, "My acceleration from 12:00 to 13:30 was a constant 10 m/h^2"
What is wrong with her statement?

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What has she actually calculated?

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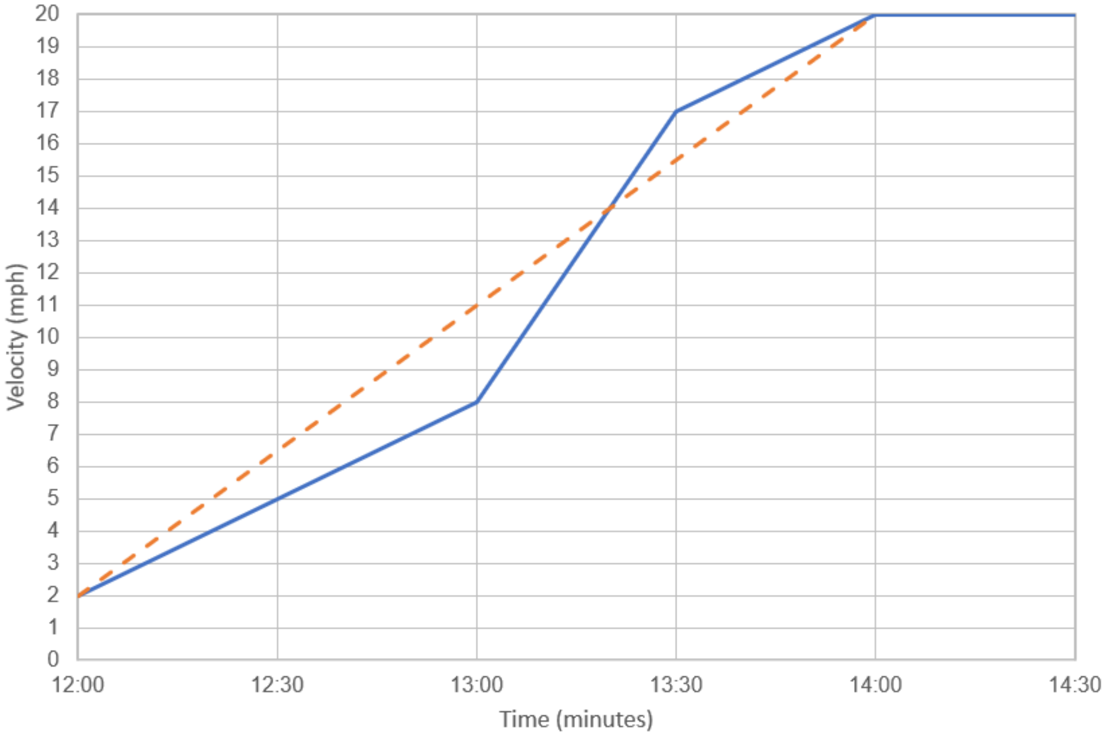
(3 marks)

5. Diane looks again at her velocity-time graph and makes a calculation of the distance she covered.



She calculates the distance covered using the dashed line to estimate her change in velocity between 12:00 and 14:00.

She states, “I rested from 14:00 to 14:30, so I can estimate the total distance covered on my journey by using the area of a trapezium”

$$\text{Distance} = \frac{2.5(2+20)}{2} = 27.5 \text{ miles}$$

a) Why is her estimate incorrect, and what is the correct estimate for her distance covered?

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distance = ………… miles

b) Is your estimate an underestimate or an overestimate? Why?

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c) Finally, how could Diane make a more accurate estimate of the distance she travelled overall?

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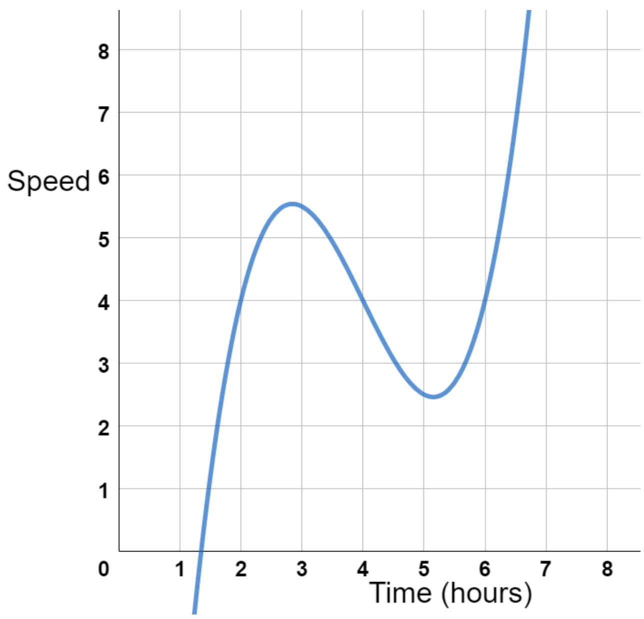
(5 marks)

6. Partition the diagram to show how you could make an estimate of the distance covered from 2 hours to 7 hours. Would your estimate be an underestimate or overestimate?



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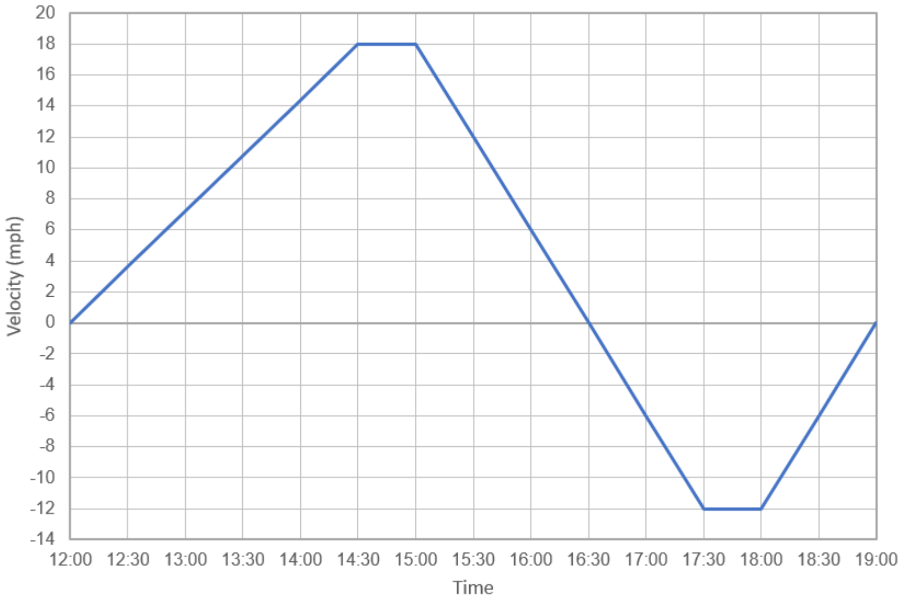
(2 marks)

7. Eirika takes a bike ride, first travelling to the shops, arriving at 16:30, then travelling to a friend's house to arrive at 19:00.



a) What does the velocity from 16:30 onwards represent?

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b) Calculate the overall distance travelled by Eirika.

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c) What is the difference between your answer and the distance between Eirika and her friend's house?

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(1 mark & 3 marks & 1 mark)