

DISTANCE - TIME GRAPHS & AVERAGE SPEED

Examiner only
Archie
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1) Aber, Tipton and Monkton are three towns on a bus route. Tipton is 20 miles from Aber and Monkton is a further 40 miles from Tipton.

Gareth catches a bus from Aber to go to Tipton. The distance-time graph drawn opposite represents the journey of Gareth's bus.

(a) At what time did Gareth's bus leave Aber?

11:40 [1]

(b) At what speed, in m.p.h., did the bus travel from Aber to Tipton?

25 mph [1]

(c) Explain fully what the part BC represents.

Gareth is at Tipton. [2]

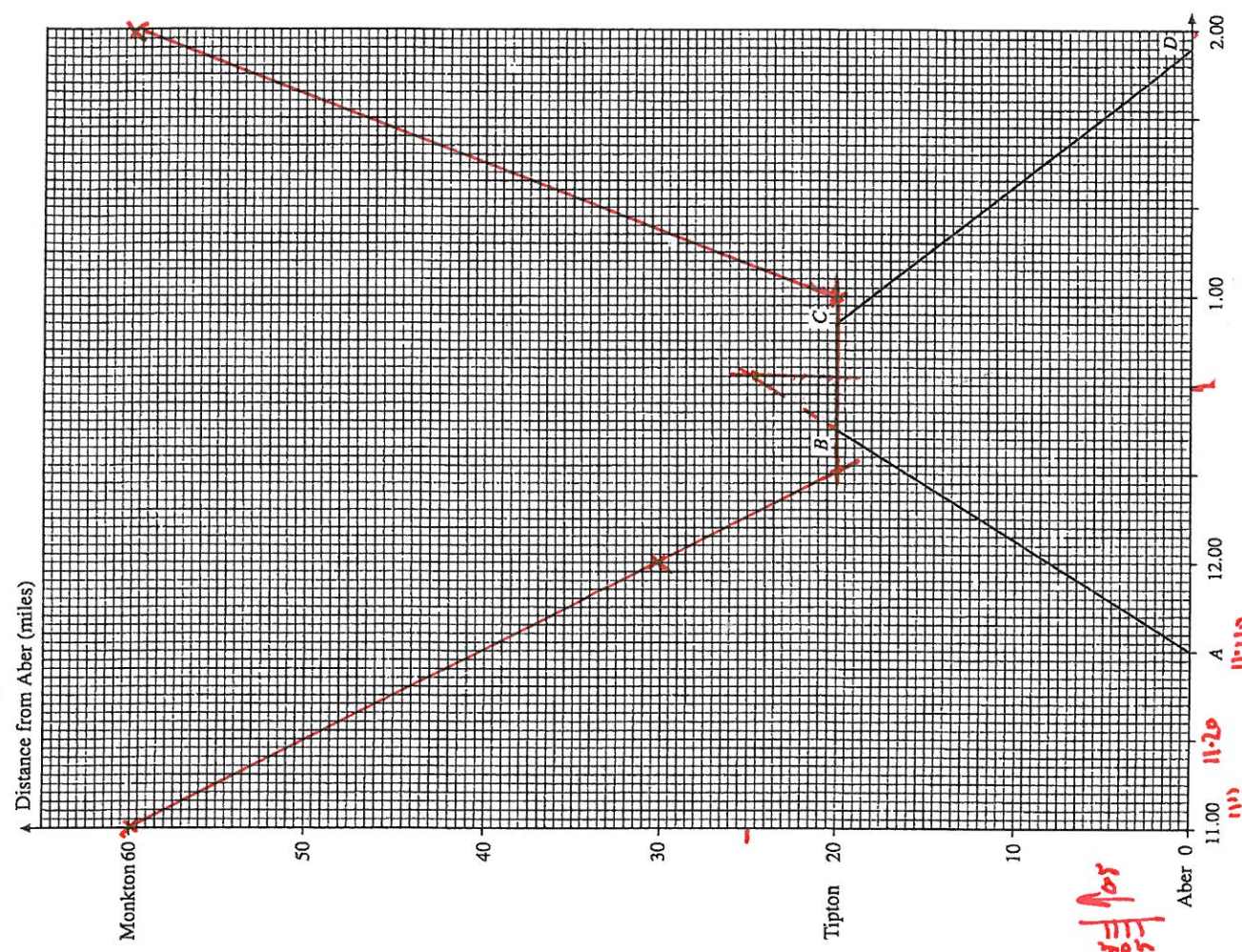
(d) Gareth's friend Roy lives in Monkton. Roy starts out at 11.00 to meet Gareth's bus at Tipton. He travels at a speed of 30 m.p.h. On the same graph paper, draw a distance-time graph of Roy's journey. [1]

(e) Explain whether or not Roy gets to Tipton in time to meet Gareth.

Yes, he arrives before Gareth. [1]

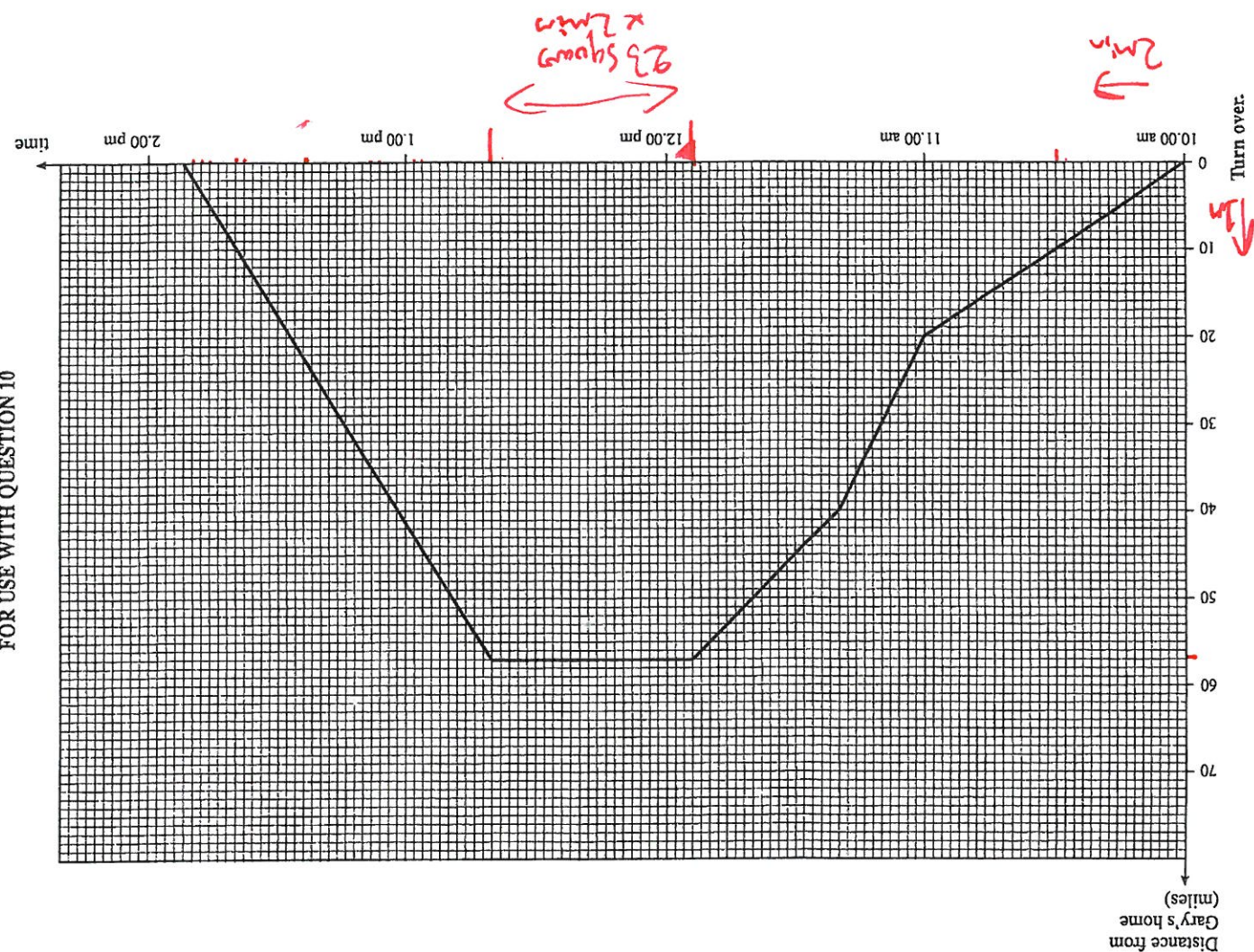
(f) Roy stays in Tipton until 1.00 then returns home by 2.00. Draw the distance-time graph of these parts of his journey. [1]

For use with question 5.



Turn over.

FOR USE WITH QUESTION 10



2 The graph opposite shows Gary's journey by car from his home to a services area, where he stops for a while before returning home.

(a) How far is the services area from Gary's home?

57 miles

[1]

(b) How long did Gary stop at the services area?

46 minutes

[1]

(c) Use the graph to find Gary's average speed, in m.p.h., for his return journey home.

$$\text{Av Speed} = \frac{\text{Dist}}{\text{time}} = \frac{57}{1.2} = 47.5 \text{ mph}$$

[2]

$$\begin{aligned} 36 \times 2 &= 72 \text{ mins} \\ &= 1 \text{ hour } 12 \text{ mins.} \\ \frac{12}{60} &= 0.2 \\ &= 1.2 \text{ hours.} \end{aligned}$$

For use with Question 10

3 Jackie lives in Whichchurch and Brian lives in Bishopston, which is 50 miles from Whichchurch. One day they decide to meet at Baglan, which is a place somewhere between their two villages. After meeting they each return home. The graphs on the next page show part of their journeys.

(a) How far is Baglan from Bishopston?

22 miles

[1]

(b) How long has Jackie been waiting at Baglan when Brian arrives?

15 mins

[1]

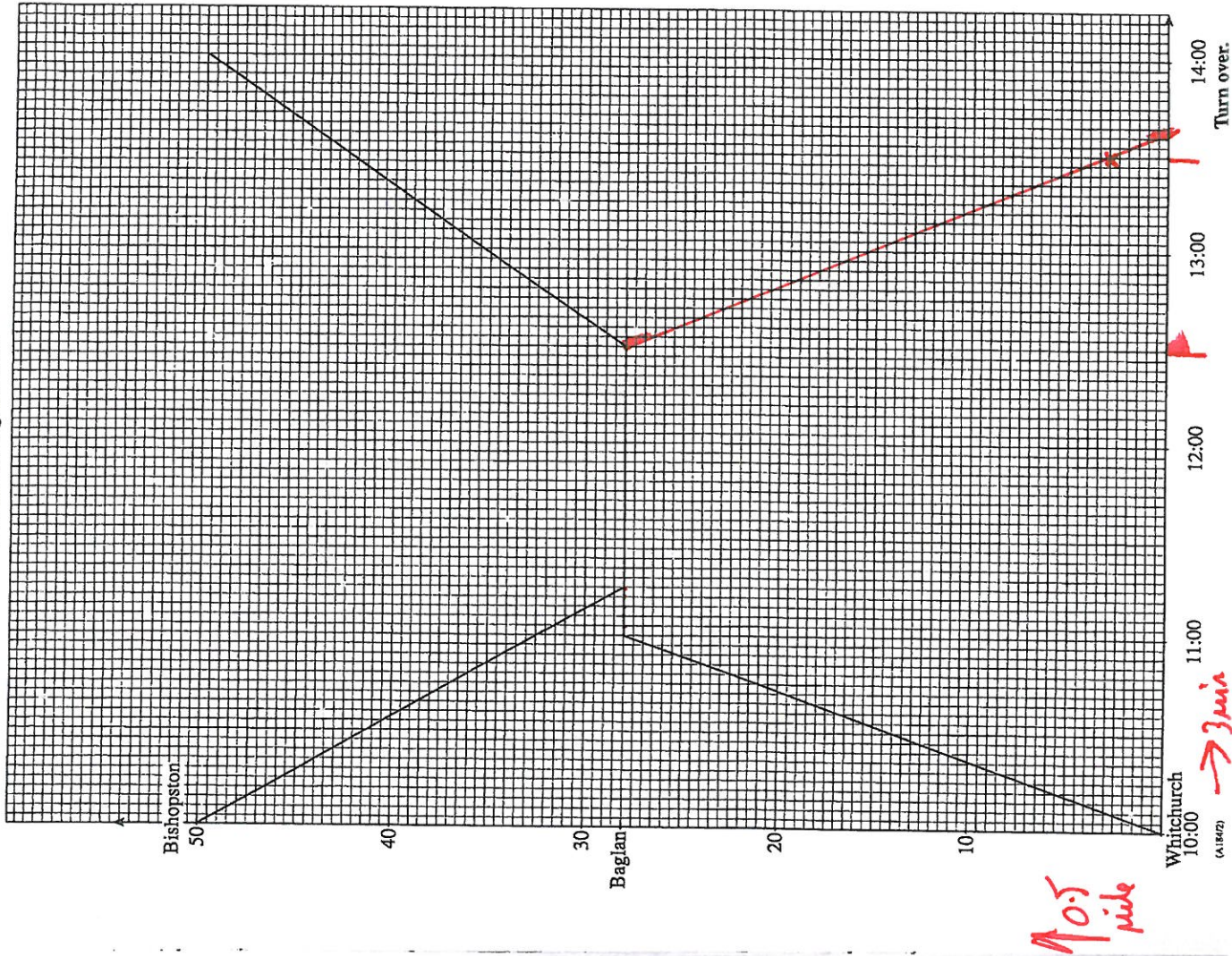
(c) Without calculating any speeds, explain how you can tell whether or not Jackie had a higher average speed on her way to Baglan, than Brian had on his way home from Baglan.

Jackie had higher speed because her line is steeper.

[1]

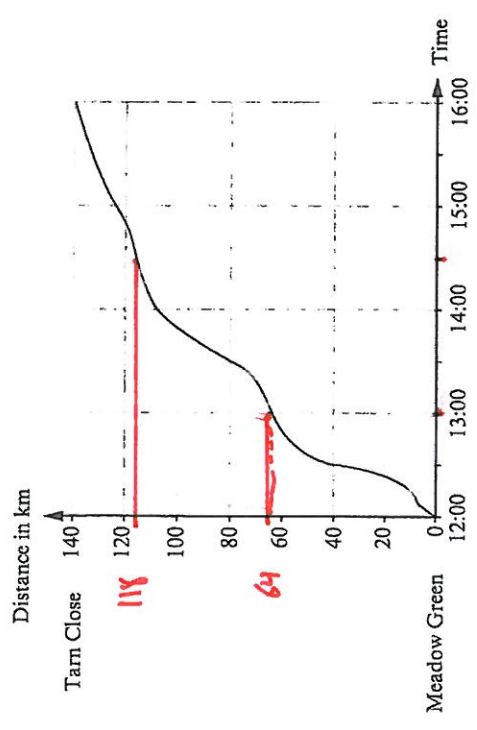
(d) Jackie leaves for home at the same time as Brian. She travels home at an average speed of 25 m.p.h. Draw this part of her journey on the graph paper.

[2]



(4)

The distance-time graph shows a 140 km journey from Meadow Green to Tarn Close.



(a) (i) What is the distance travelled between 13:00 and 14:30?

54 km

(ii) Find the average speed for this part of the journey.

$$\text{Speed} = \frac{\text{Dist}}{\text{Time}} = \frac{54}{1.5} = 36 \text{ km/h}$$

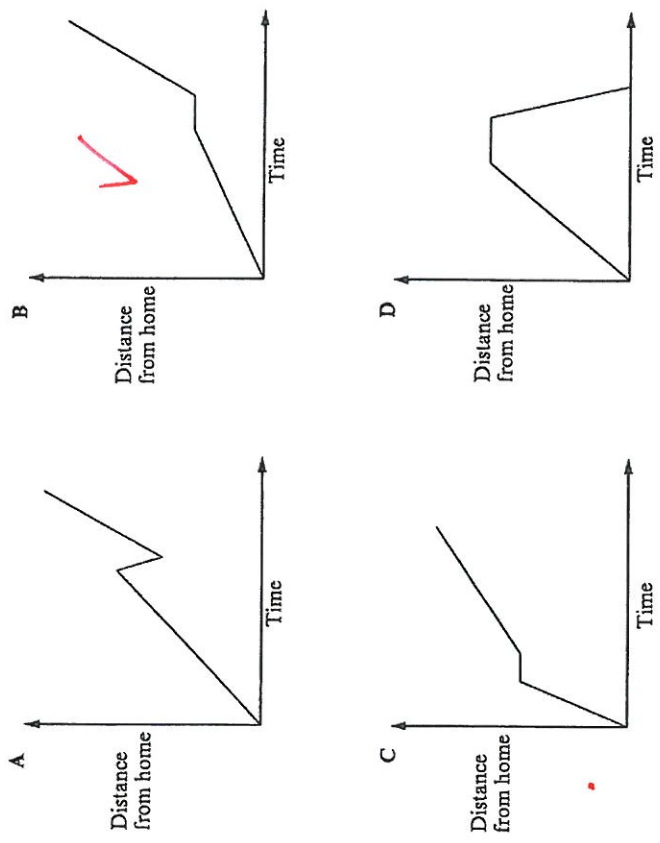
(b) Explain how you can tell from the graph that it took less time to travel the first 70 km of the journey than it took to travel the final 70 km of the journey.

Because the curve is much steeper for the first part of the journey which means it is travelling faster.

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(5)

Sammi left home and drove to work. Along the way she had to stop at a school crossing. She then travelled at an increased speed until she arrived at work. Which graph best shows her journey? Give a full explanation for your answer.



Graph B because the flat line shows where she stopped and then the line gets steeper than it was before she stopped which means she was then travelling faster.

(3)