

Distance-time graphs - Worksheet

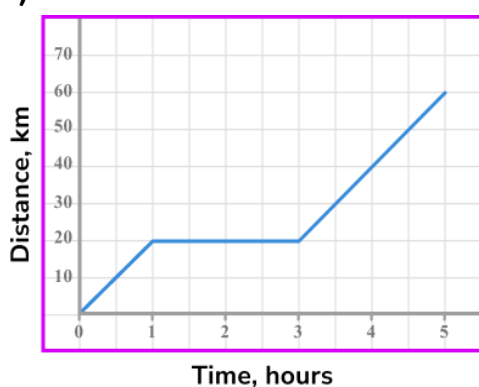
Skill

Group A - Reading from distance-time graphs

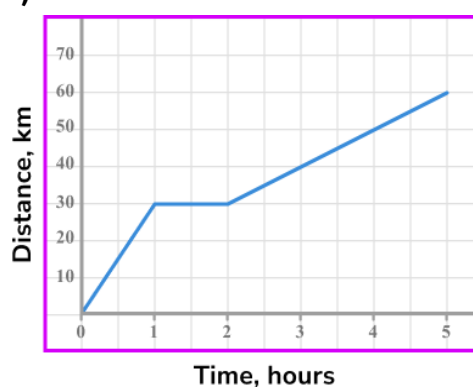
For the distance-time graphs find:

- (a) The distance travelled when the object first stops
- (b) The time spent stationary
- (c) The speed on the first part of the journey
- (d) The speed on the second part of the journey

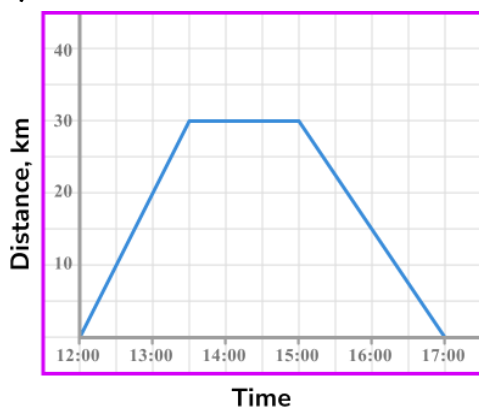
1)



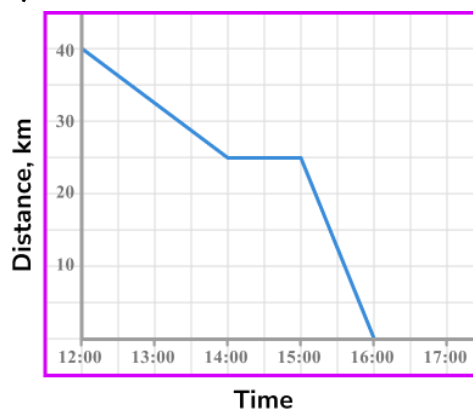
2)



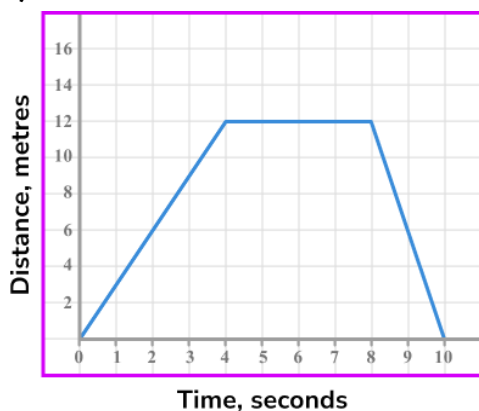
3)



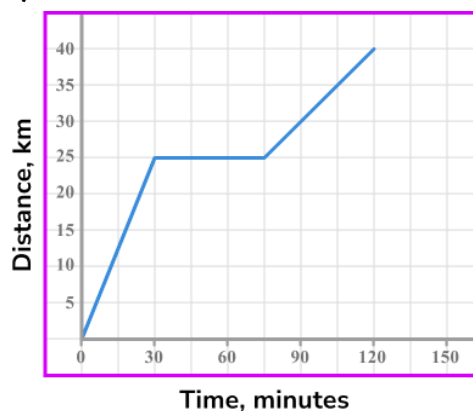
4)



5)



6)

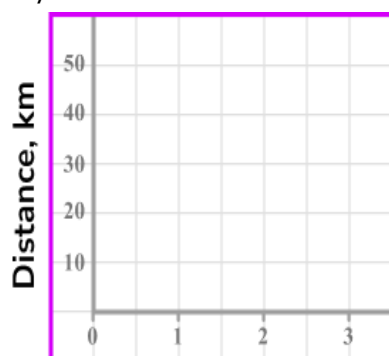


Distance-time graphs - Worksheet

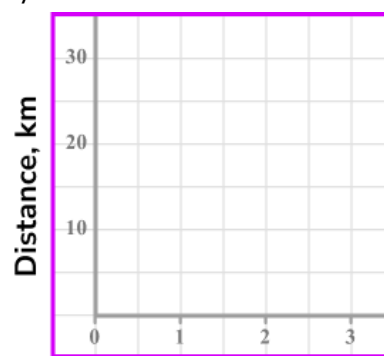
Group B - Representing a speed on a distance-time graph

Use the starting distance and direction given to draw lines to represent the speeds:

- 1) Start at 0km , travelling away from home. 2) Start at 0km , travelling away from home.
- a. 10km/h for 1 hour a. 15km/h for 2 hours
- b. 20km/h for 2 hours b. 5km/h for 3 hours

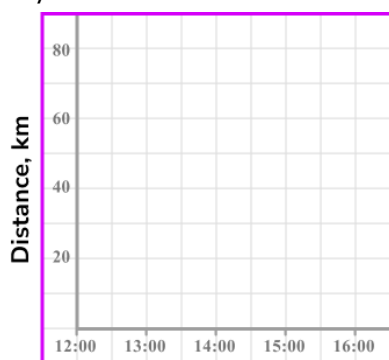


Time

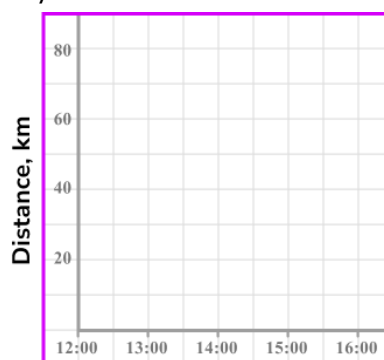


Time

- 3) Start at 10km , travelling away from home. 4) Start at 60km , travelling towards home.
- a. 20km/h for 3 hours a. 10km/h for 2 hours
- b. 30km/h for 2 hours b. 20km/h for 2 hours

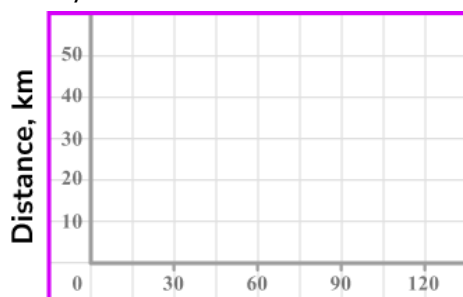


Time

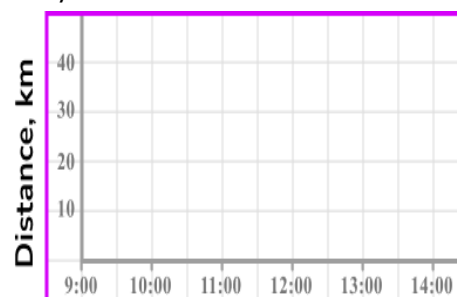


Time

- 5) Start at 50km , travelling towards home. 6) Start at 40km , travelling towards home.
- a. 15km/h for 2 hours a. 5km/h for 4 hours
- b. 25km/h for 2 hours b. 4km/h for 5 hours



Time, minutes



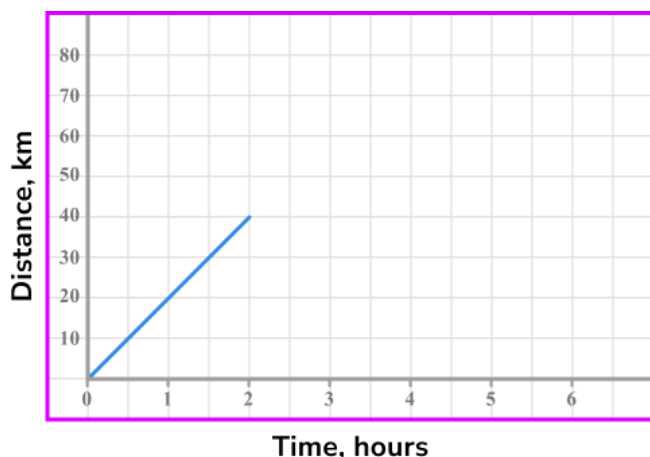
Time

Distance-time graphs - Worksheet

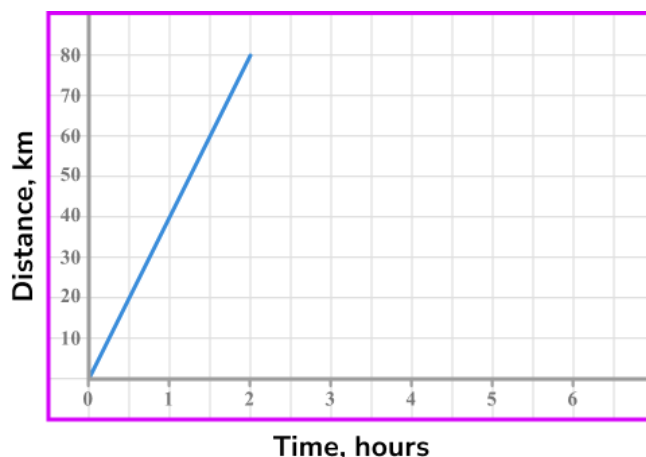
Group C - Completing a distance-time graph

Use the information required to complete the distance-time graph and find the average speed for the whole journey.

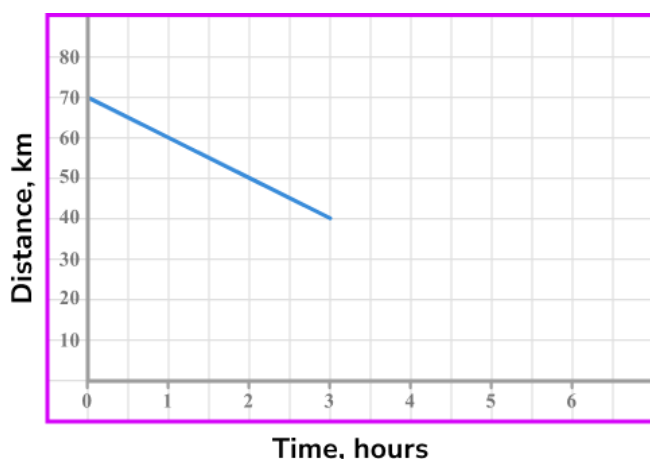
1) Jon has travelled 40km away from home which took 2 hours. He stops for 1 hour and then continues travelling away from home for a further 3 hours until he reaches a total distance of 70km .



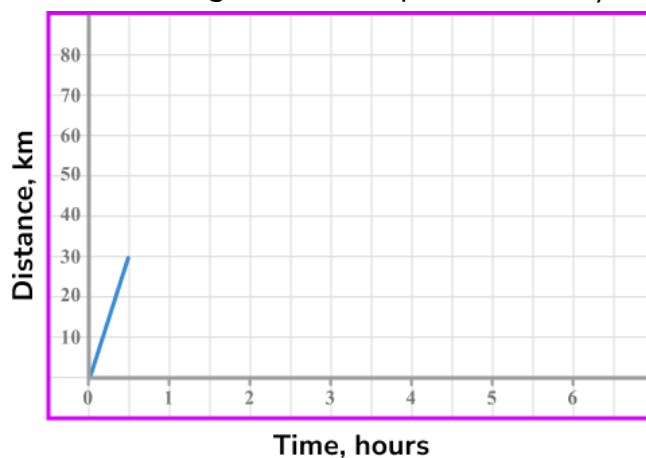
2) Jane has travelled away from home and reached a distance of 80km in 2 hours. She stops for 90 minutes and returns home after a further hour.



3) Sheikh is returning home from a distance of 70 km . He travels 30km in 3 hours and then immediately changes his speed to 20km/h for the remainder of his journey home.



4) Nadine has travelled away from home and reached a distance of 30km after 30 minutes. She stops for 90 minutes and then continues moving away from home at a speed of 60km/h for 30 minutes. She again stops for 1 hour before returning home at a speed of 40km/h .



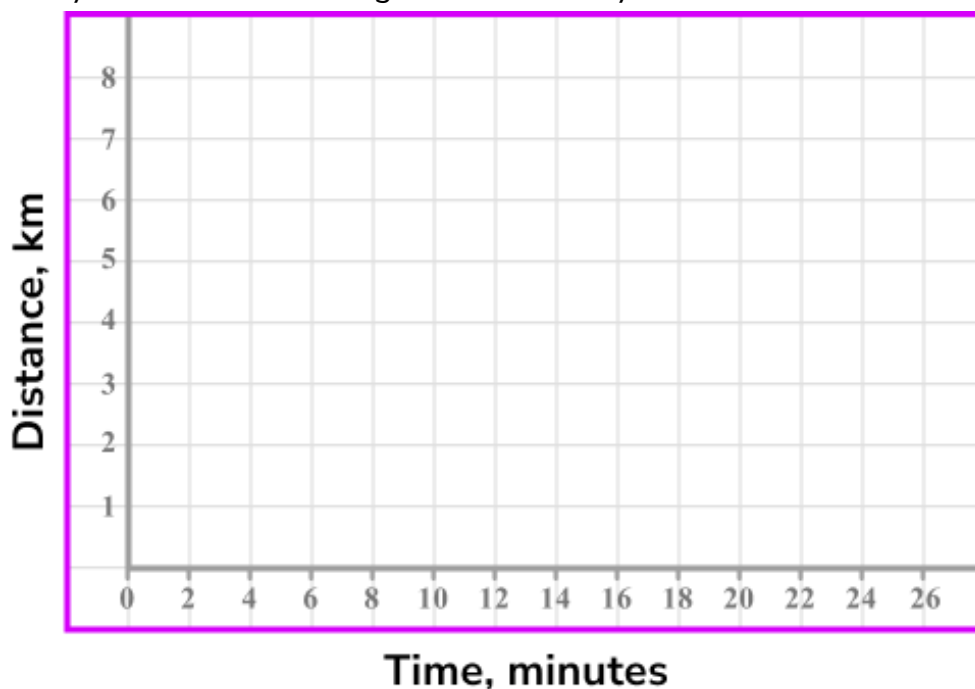
Distance-time graphs - Worksheet

Applied

- 1) A town has a straight tram line through its town centre. The diagram shows the distances between each destination and the journey times. The tram stops at each destination for 2 minutes before moving to the next at a constant speed.



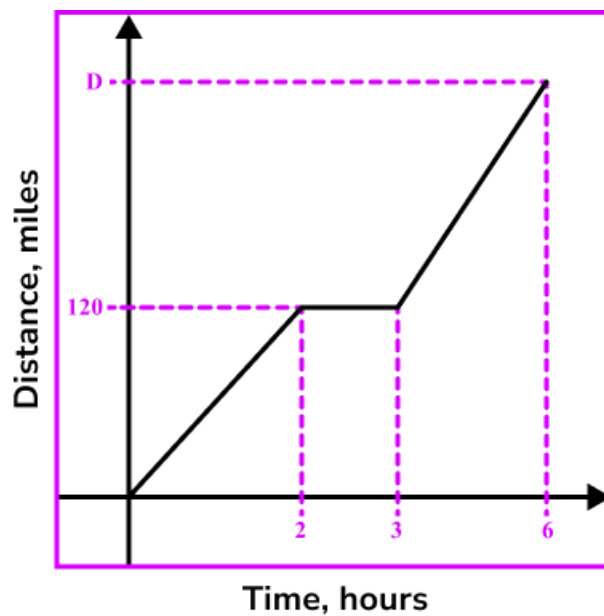
- (a) Use the axes provided to draw a distance time graph for the tram's journey after it starts moving from the Library towards the Church.



- (b) Calculate the average speed for the journey between the swimming pool and the shopping centre

Distance-time graphs - Worksheet

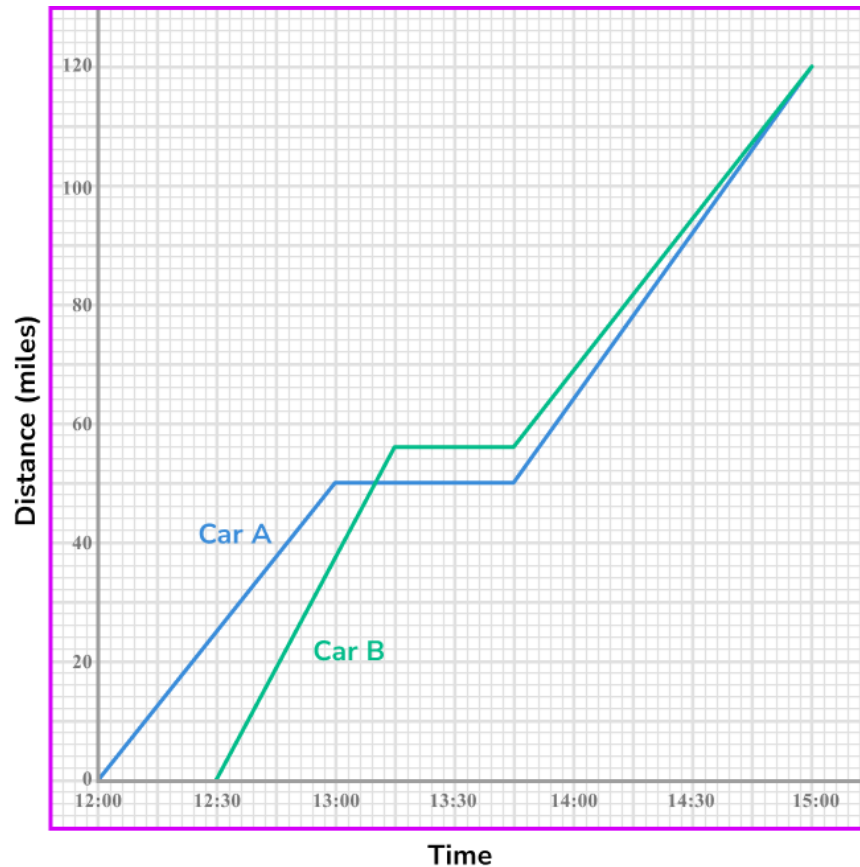
- 2) The diagram shows a distance-time graph.



- (a) The average speed for the whole journey was 50 miles per hour.
Find the value of D
- (b) Find the speed, in miles per hour, for the second part of the journey

Distance-time graphs - Worksheet

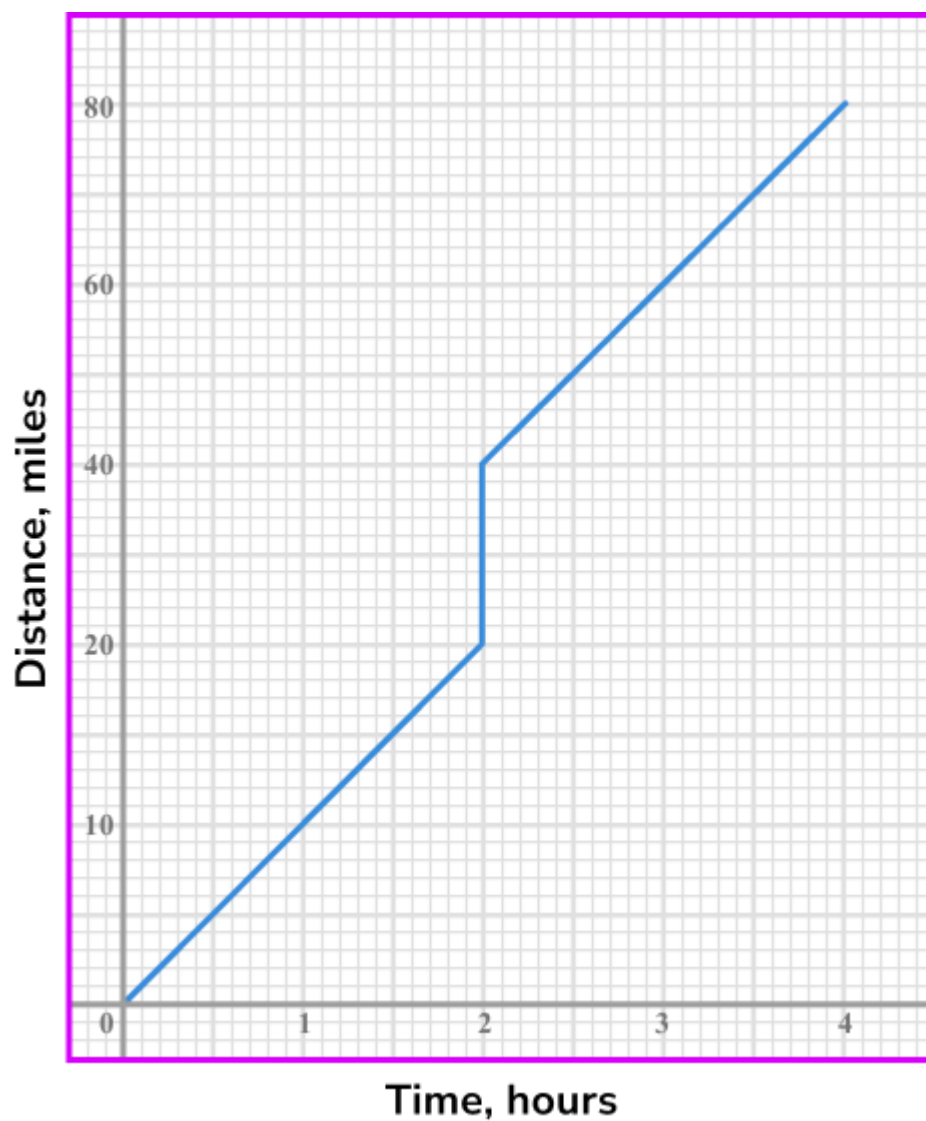
- 3) The distance-time graph shows the journeys of two cars travelling from London to Birmingham on a motorway. Both cars stop at a motorway service station on their journey.



- (a) Calculate Car A's speed for the second part of its journey,
- (b) The speed limit on the motorway is 70 miles per hour.
Does Car B exceed the speed limit in the first part of their journey?

Distance-time graphs - Worksheet

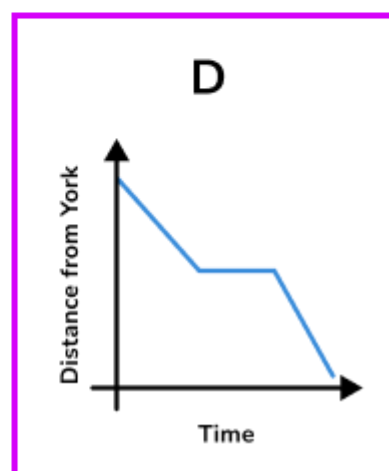
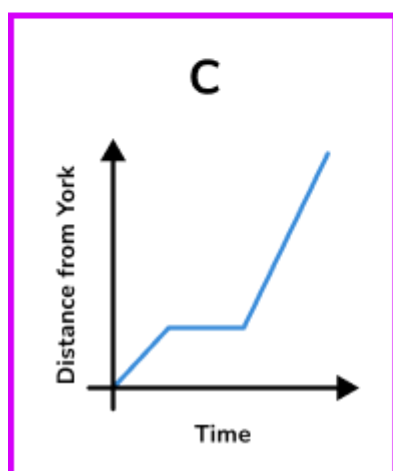
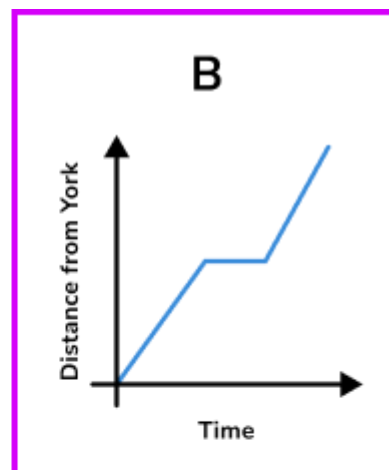
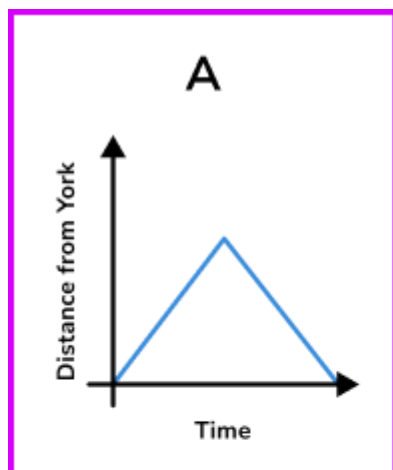
- 4) The diagram shows a distance-time graph drawn by a school student.



Describe two mistakes made by the student.

Distance-time graphs - Exam Questions

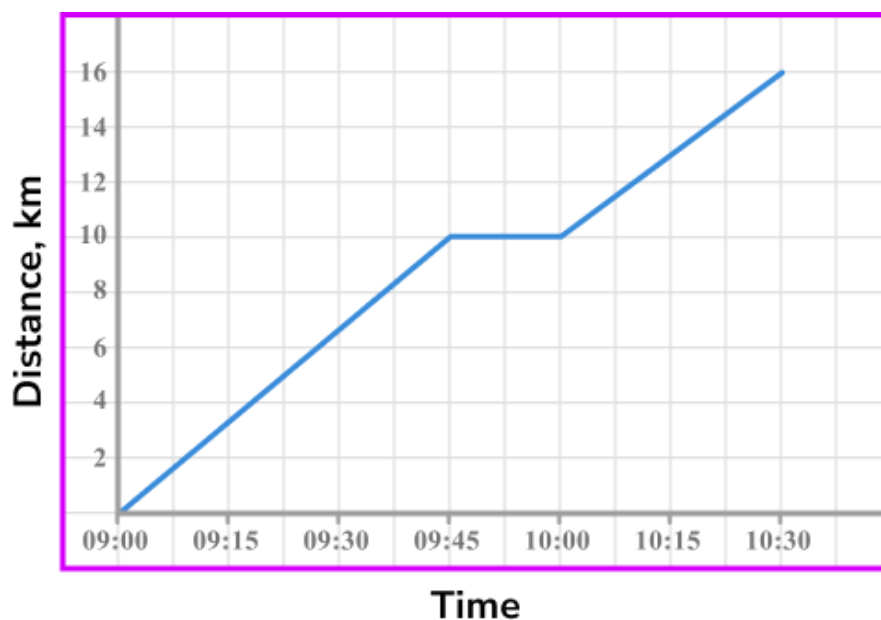
- 1) A salesperson was driving on a motorway from London to York. He stopped at a motorway service station halfway into his journey. Which of the distance-time graphs could represent his journey.



.....
(1 mark)

Distance-time graphs - Exam Questions

- 2) The distance-time graph shows part of a journey Sarah took on a bike ride.



- (a) What did Sarah do between 09:45 and 10:00?

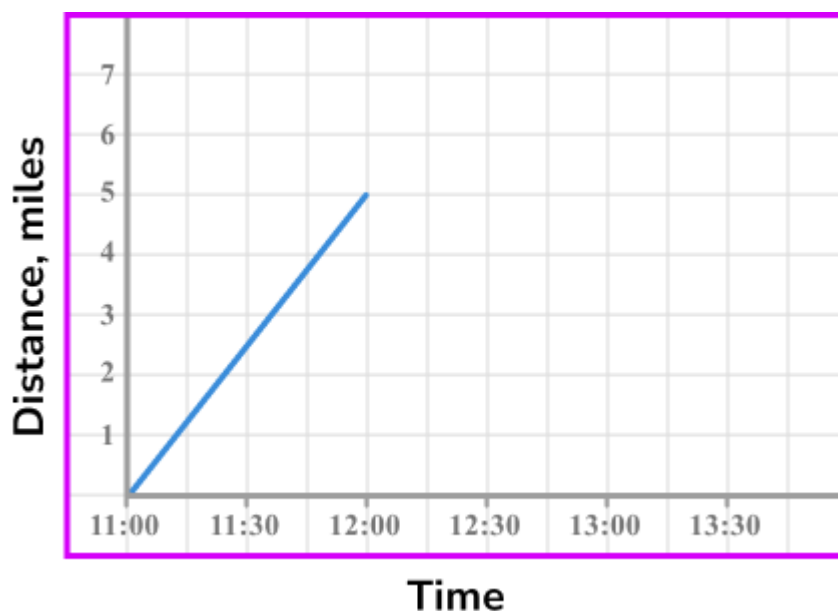
.....
(1)

- (b) What was Sarah's speed between 10:00 and 10:30, in km/h ?

.....
(2)
(3 marks)

Distance-time graphs - Exam Questions

- 3) The distance-time graph shows the first part of a journey of a person on a shopping trip.



The person walked from their home to the shop and arrived at 12:00. The person stays in the shop for 15 minutes and then catches a bus home. The bus stopped outside their door and travelled at an average speed of 20 miles per hour.

- (a) At what speed did they walk to the shops? Give your answer in miles per hour.

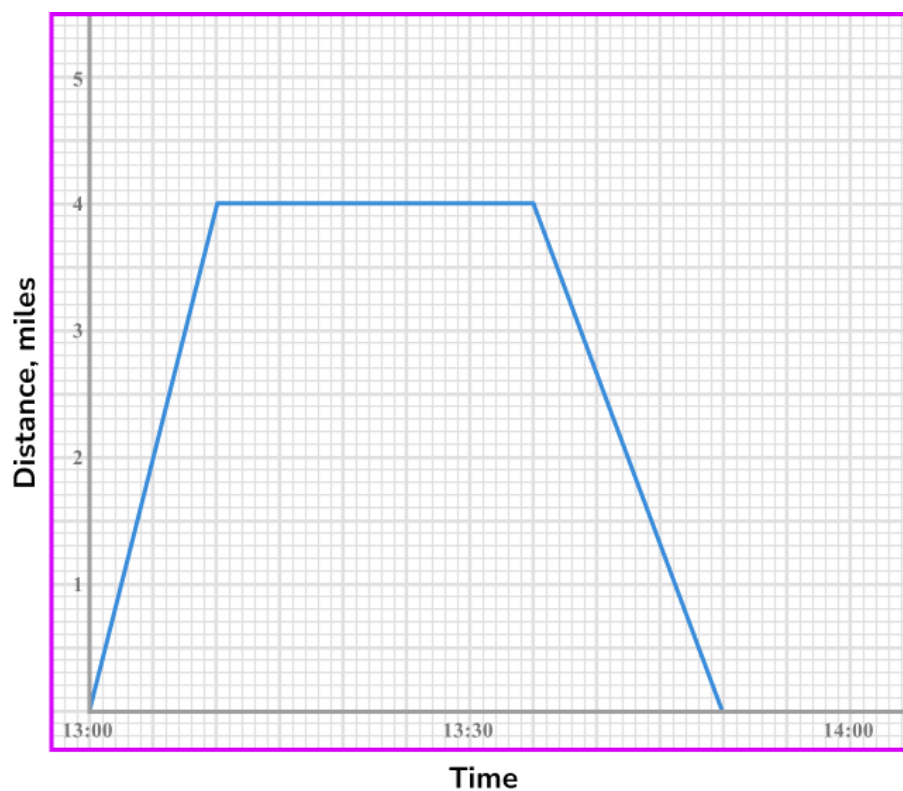
.....
(1)

- (b) Complete the distance-time graph showing the remaining parts of their journey.

(3)
(4 marks)

Distance-time graphs - Exam Questions

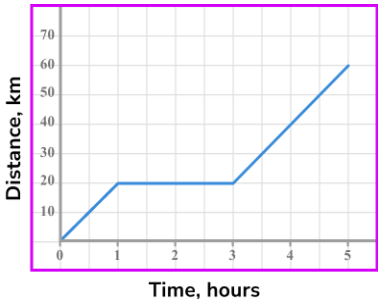
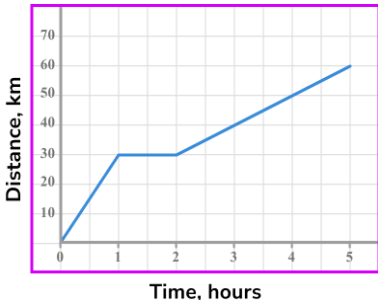
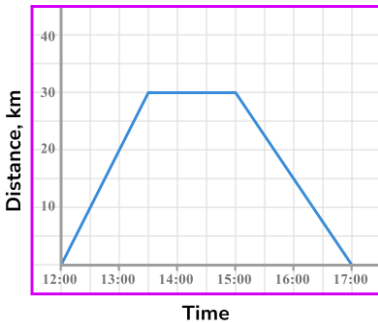
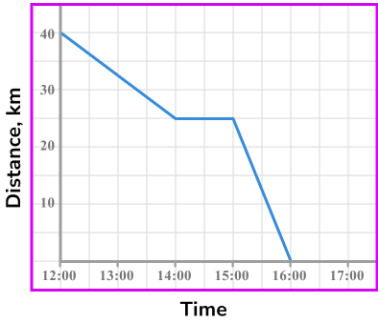
- 4) The distance-time graph shows Olivia's journey to the supermarket and then back home.



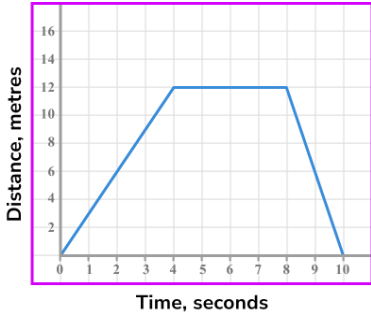
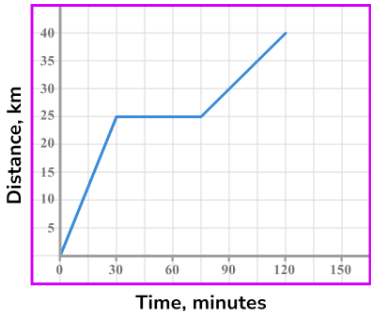
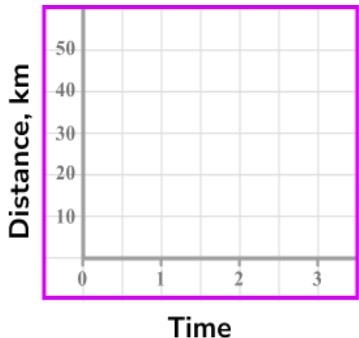
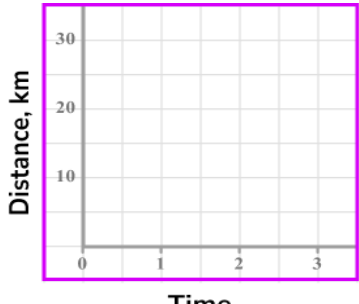
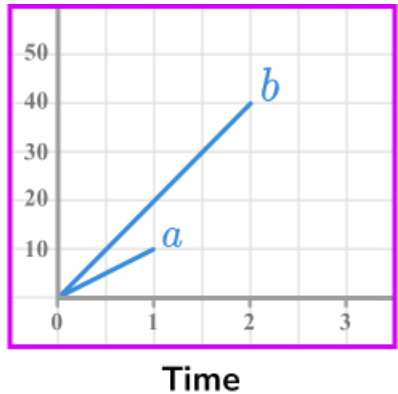
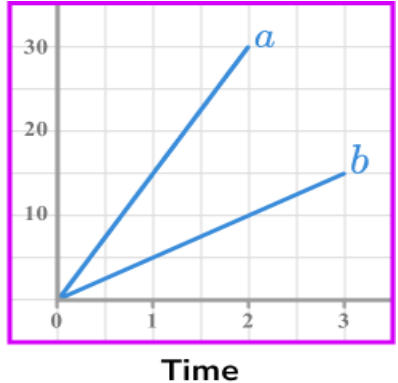
Find the difference between her speed travelling to the supermarket and her speed on her way back home.

.....
(3 marks)

Distance-time graphs - Answers

	Question	Answer
	Skill Questions	
Group A	<p>For the distance-time graphs find:</p> <p>(a) The distance travelled when the object first stops</p> <p>(b) The time spent stationary</p> <p>(c) The speed on the first part of the journey</p> <p>(d) The speed on the second part of the journey</p> <p>1)</p>  <p>2)</p>  <p>3)</p>  <p>4)</p> 	<p>1)</p> <p>a) 20km b) 2 hours c) 20km/h d) 20km/h</p> <p>2)</p> <p>a) 30km b) 1 hour c) 30km/h d) 10km/h</p> <p>3)</p> <p>a) 30km b) 1.5 hours c) 20km/h d) 15km/h</p> <p>4)</p> <p>a) 15km b) 1 hour c) 7.5km/h d) 25km/h</p>

Distance-time graphs - Answers

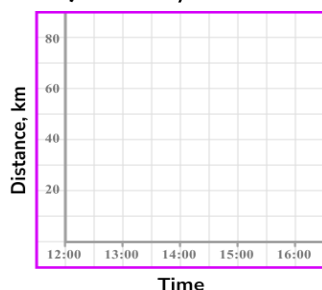
<p>Group A contd</p>	<p>5) </p> <p>6) </p>	<p>5) a) 12 metres b) 4 seconds c) $3m/s$ d) $6m/s$</p> <p>6) a) 25km b) 45 minutes c) $50km/h$ or $0.8\dot{3}km/min$ d) $20km/h$ or $0.\dot{3}km/min$</p>
<p>Group B</p>	<p>Use the starting distance and direction given to draw lines to represent the speeds:</p> <p>1) Start at $0km$, travelling away from home. a) $10km/h$ for 1 hour b) $20km/h$ for 2 hours</p> <p></p> <p>2) Start at $0km$, travelling away from home. a) $15km/h$ for 2 hours b) $5km/h$ for 3 hours</p> <p></p>	<p>1) </p> <p>2) </p>

Distance-time graphs - Answers

Group B
contd

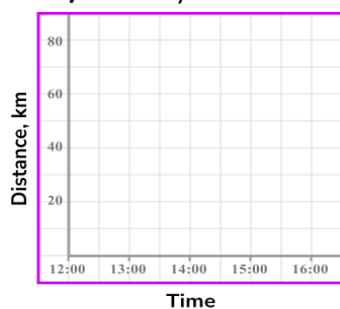
3) Start at 10km, travelling away from home.

- a) 20km/h for 3 hours
b) 30km/h for 2 hours



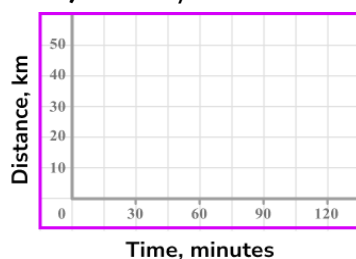
4) Start at 60km, travelling towards home.

- a) 10km/h for 2 hours
b) 20km/h for 2 hours



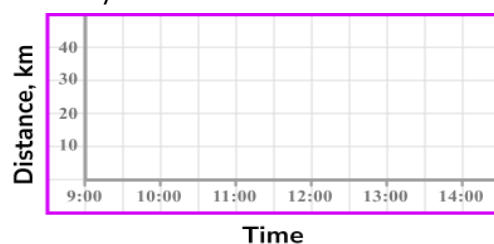
5) Start at 50km, travelling towards home.

- a) 15km/h for 2 hours
b) 25km/h for 2 hours

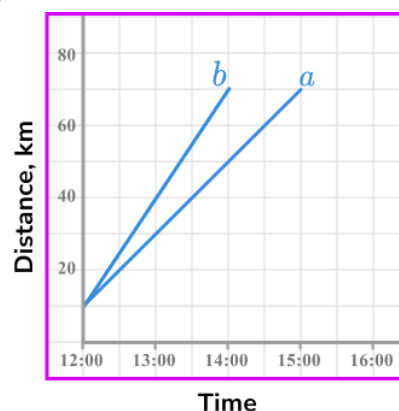


6) Start at 40km, travelling towards home.

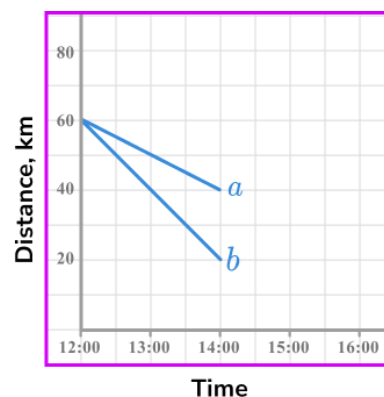
- a. 5km/h for 4 hours
b. 4km/h for 5 hours



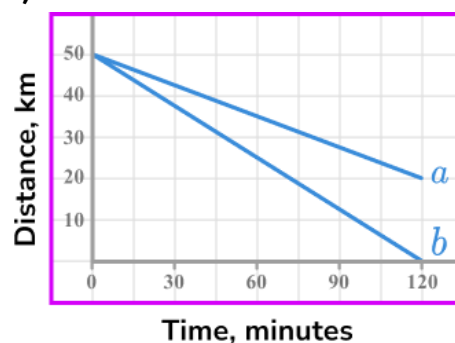
3)



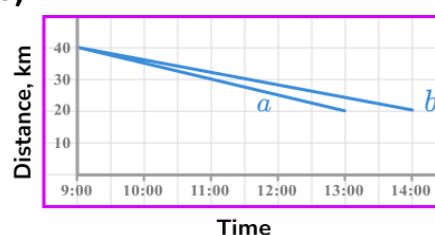
4)



5)



6)

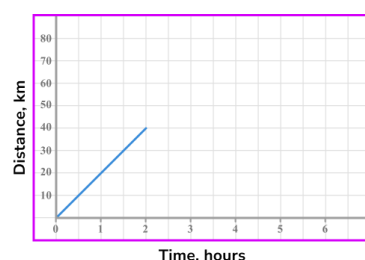


Distance-time graphs - Answers

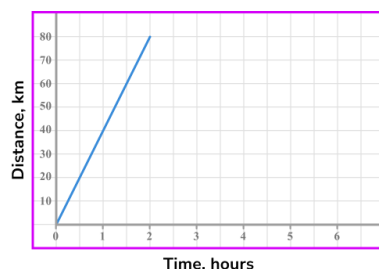
Group C

Use the information required to complete the distance-time graph and find the average speed for the whole journey.

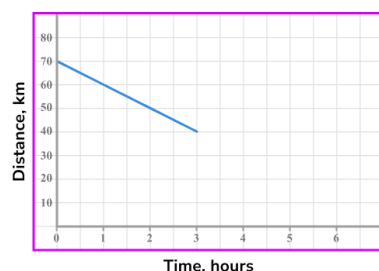
1) Jon has travelled 40km away from home which took 2 hours. He stops for 1 hour and then continues travelling away from home for a further 3 hours until he reaches a total distance of 70km .



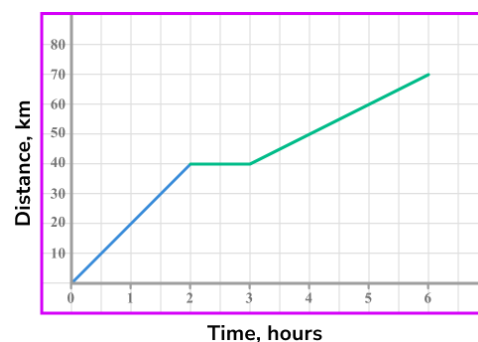
2) Jane has travelled away from home and reached a distance of 80km in 2 hours. She stops for 90 minutes and returns home after a further hour.



3) Sheikh is returning home from a distance of 70 km . He travels 30km in 3 hours and then immediately changes his speed to 20km/h for the remainder of his journey home.

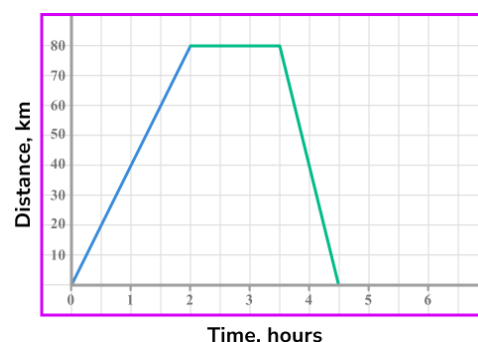


1)



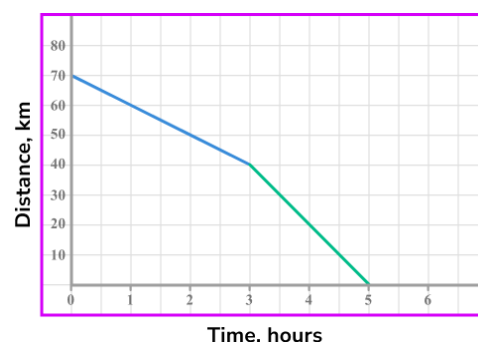
Average speed =
 11.67km/h (2 d.p.)

2)



Average speed =
 35.56km/h (2 d.p.)

3)

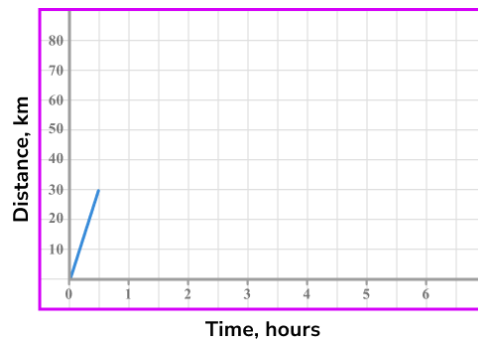


Average speed = 14km/h

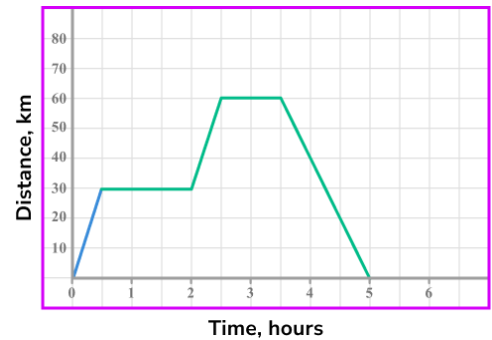
Distance-time graphs - Answers

Group C
contd

4) Nadine has travelled away from home and reached a distance of 30 km after 30 minutes. She stops for 90 minutes and then continues moving away from home at a speed of 60 km/h for 30 minutes. She again stops for 1 hour before returning home at a speed of 40 km/h .


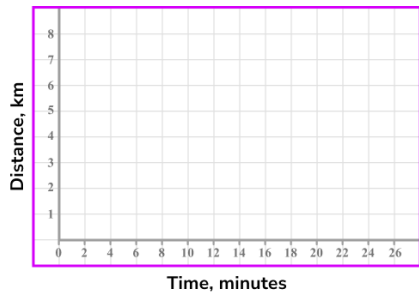
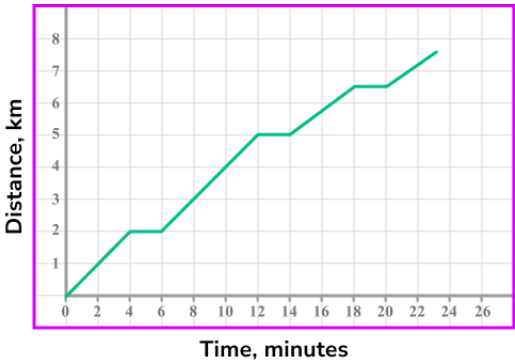


4)



Average speed = 24 km/h

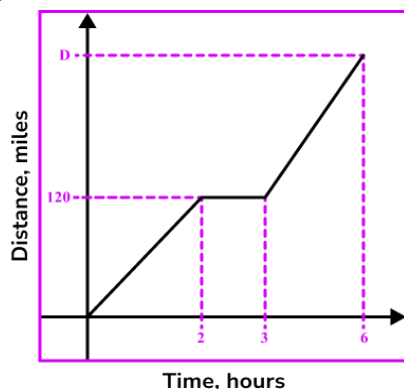
Distance-time graphs - Answers

	Question	Answer
	Applied Questions	
1)	<p>A town has a straight tram line through its town centre. The diagram shows the distances between each destination and the journey times. The tram stops at each destination for 2 minutes before moving to the next at a constant speed.</p>  <p>a) Use the axes provided to draw a distance time graph for the tram's journey after it starts moving from the Library towards the Church.</p>  <p>b) Calculate the average speed for the journey between the swimming pool and the shopping centre</p>	<p>a)</p>  <p>b) 4.5km in 12 minutes gives 22.5km/h</p>

Distance-time graphs - Answers

2)

The diagram shows a distance-time graph.



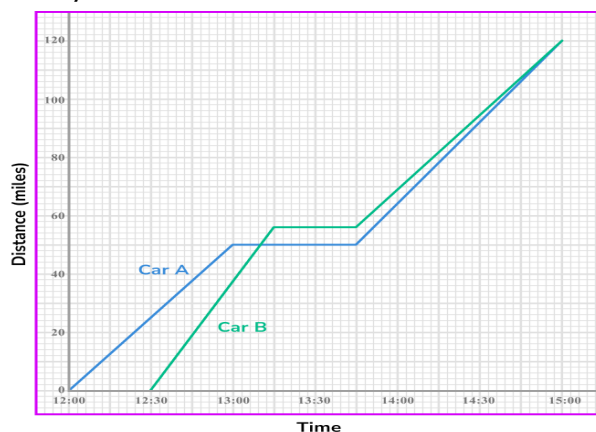
- a) The average speed for the whole journey was 50 miles per hour. Find the value of D
- b) Find the speed, in miles per hour, for the second part of the journey

a) 300

b) 60mph

3)

The distance-time graph shows the journeys of two cars travelling from London to Birmingham on a motorway. Both cars stop at a motorway service station on their journey.



- a) Calculate Car A's speed for the second part of its journey,
- b) The speed limit on the motorway is 70 miles per hour. Does Car B exceed the speed limit in the first part of their journey?

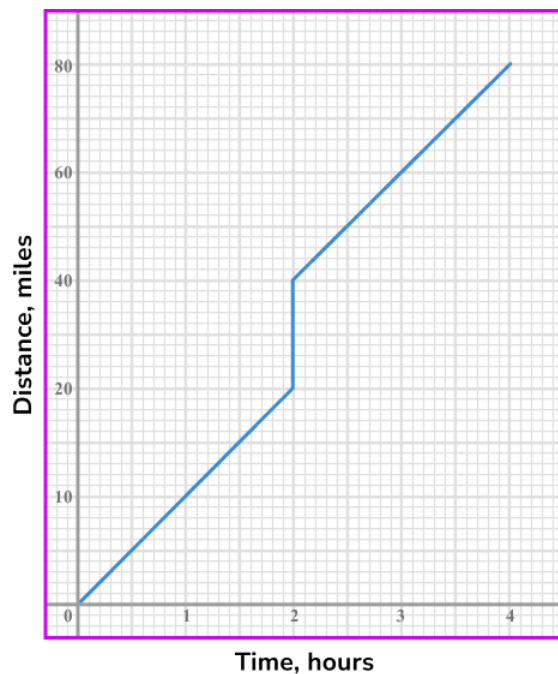
a) 56mph

b) 56 miles in 45 minutes gives a speed of 74.666... mph
Yes, Car B exceeds the speed limit.

Distance-time graphs - Answers

4)

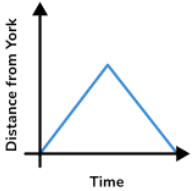
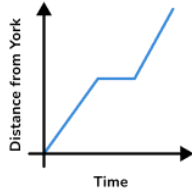
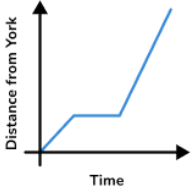
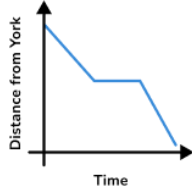
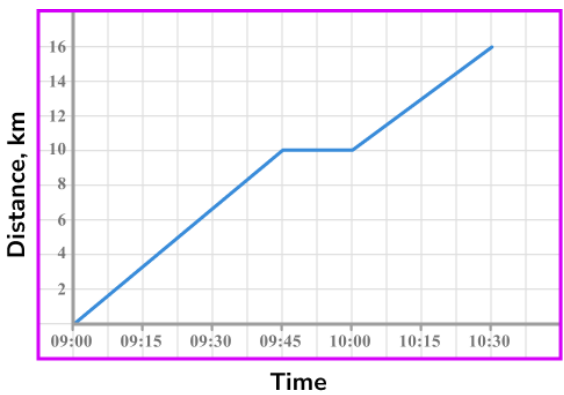
The diagram shows a distance-time graph drawn by a school student.



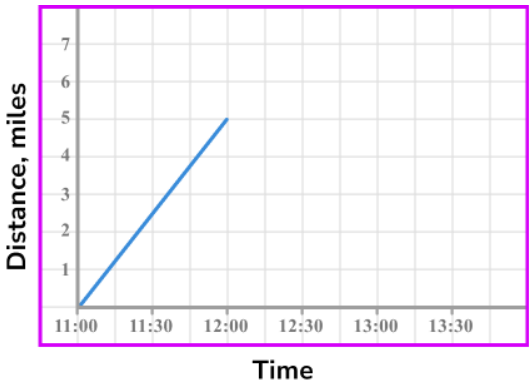
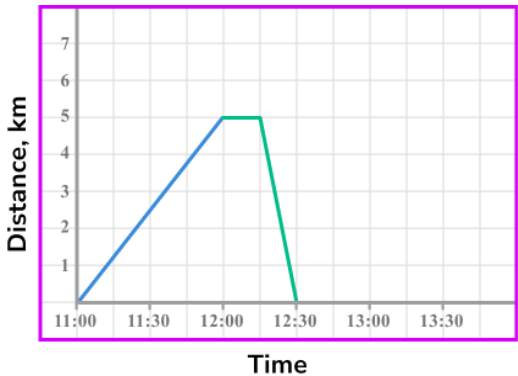
Describe two mistakes made by the student.

- 1)** Vertical scale incorrect, inconsistent gaps.
- 2)** Vertical line at 2 hours impossible

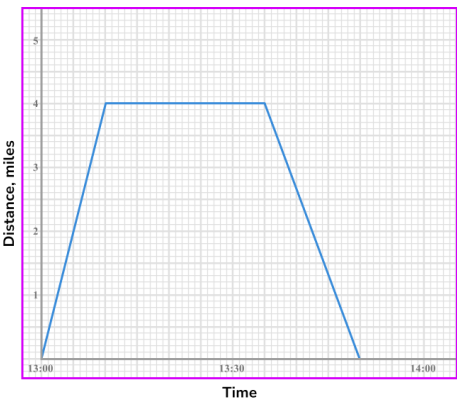
Distance-time graphs - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	<p>A salesperson was driving on a motorway from London to York. He stopped at a motorway service station halfway into his journey. Which of the distance-time graphs could represent his journey.</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="border: 1px solid #800080; padding: 5px; margin: 5px;"> <p style="text-align: center;">A</p>  </div> <div style="border: 1px solid #800080; padding: 5px; margin: 5px;"> <p style="text-align: center;">B</p>  </div> <div style="border: 1px solid #800080; padding: 5px; margin: 5px;"> <p style="text-align: center;">C</p>  </div> <div style="border: 1px solid #800080; padding: 5px; margin: 5px;"> <p style="text-align: center;">D</p>  </div> </div>	B	(1)
2)	<p>The distance-time graph shows part of a journey Sarah took on a bike ride.</p> 		
(a)	What did Sarah do between 09: 45 and 10: 00?	(a) She stopped moving/was stationary	(1)
(b)	What was Sarah's speed between 10: 00 and 10: 30, in km/h?	(b) $6 \div 0.5$ oe 12km/h	(1) (1)

Distance-time graphs - Mark Scheme

<p>3)</p>	<p>The distance-time graph shows the first part of a journey of a person on a shopping trip.</p>  <p>The person walked from their home to the shop and arrived at 12:00 The person stays in the shop for 15 minutes and then catches a bus home. The bus stopped outside their door and travelled at an average speed of 20 miles per hour.</p> <p>(a) At what speed did they walk to the shops? Give your answer in miles per hour.</p>	<p>(a) 5mph</p>	<p>(1)</p>
<p>(b)</p>	<p>Complete the distance-time graph showing the remaining parts of their journey.</p>	<p>(b) Horizontal line to (12:15, 5) $5 \div 20 = \frac{1}{4}$ hour oe Line from (12:15, 5) to (12:30, 0)</p> 	<p>(1) (1) (1)</p>

Distance-time graphs - Mark Scheme

4)	<p>The distance-time graph shows Olivia's journey to the supermarket and then back home.</p>  <p>Find the difference between her speed travelling to the supermarket and her speed on her way back home.</p>	<p>24mph or 16mph 24mph and 16mph $24 - 16 = 8\text{mph}$</p>	<p>(1) (1) (1)</p>
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