4.4 Real Life and Distance Time Graphs: 30-minute Pack

Total Marks

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A walker goes from home to a park in 40 minutes at a steady speed of 4 km/h. Another walker takes 60 minutes to reach the same park along the same route.

(a) Work out the distance from home to the park. **(2)**

.....

(b) Which walker was faster? Give a reason. **(1)**

.....

(Total for Question 1 is 3 marks)

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2 A toy car's distance-time graph shows it travels 50 m in the first 10 seconds.
Work out the speed in m/s and in km/h.

(Total for Question 2 is 2 marks)

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3 From a distance-time graph a car travels from 0 hours to 2 hours and its distance increases from 0 km to 90 km. Work out the average speed of the car in km/h for this period.

(Total for Question 3 is 2 marks)

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4 A distance-time graph for a short bus journey shows the following information from the start of the journey:

0 to 10 minutes: bus is stationary at 0 km.

10 to 25 minutes: bus travels at a steady speed and reaches 6 km at 25 minutes.

25 to 30 minutes: bus is stationary for a short stop.

30 to 40 minutes: bus travels and reaches 10 km at 40 minutes.

Work out the total distance travelled by the bus from 0 to 40 minutes.

(Total for Question 4 is 3 marks)

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5 A runner's distance-time graph shows these points: 0 min = 0 m, 5 min = 1000 m, 8 min = 1000 m, 12 min = 3000 m, 14 min = 2000 m.

(a) Work out the runner's speed during the first running section (0 to 5 min) in m/s, correct to 2 decimal places. **(2)**

.....

(b) Describe what happens to the runner between 12 min and 14 min. **(1)**

.....

(c) Work out the total distance the runner travelled during the whole 14 minutes. **(1)**

.....

(Total for Question 5 is 4 marks)

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6 A coach travels 16 km in 50 minutes.

Work out the average speed in kilometres per hour.

(Total for Question 6 is 2 marks)

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7 Anna leaves home at 09:00 and cycles along a straight road at 10 km/h. Ben leaves the same home at 09:12 and follows her along the same road at 14 km/h.
At what time does Ben catch up with Anna?

(Total for Question 7 is 4 marks)

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8 Two towns A and B are 18 km apart on a straight road. Priya walks from A towards B at 6 km/h. At the same time Omar walks from B towards A at 18 km/h.
How far from A are they when they meet?

(Total for Question 8 is 3 marks)

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Mark scheme · 4.4 Real Life and Distance Time Graphs: 30-minute Pack

Question 1

(a) use distance = speed x time, convert 40 minutes to hours 40/60 = 2/3	**M1**
(a) 8/3 km or 2.67 km awrt	**A1**

(a) Answer: 8/3 km (2.67 km, awrt)

(b) first walker faster because they took less time for same distance (or higher speed 4 km/h vs 8/3 km in 60 min gives 8/3 km/h) oe	**B1**

(b) Answer: The first walker was faster. Reason: they reached the park in 40 minutes at 4 km/h, which is a higher speed than the other walker who took 60 minutes for the same distance.

Question 2

calculate 50/10 = 5 m/s	**M1**
5 m/s and 18 km/h cao	**A1**

Answer: 5 m/s and 18 km/h

Question 3

use speed = distance / time, e.g. 90 / 2	**M1**
45 km/h cao	**A1**

Answer: 45 km/h

Question 4

identify distances at 25 and 40 minutes (6 km and 10 km) and subtract starting 0 km	**M1**
note that final position 10 km is total distance from start	**M1**
10 km cao	**A1**

Answer: 10 km

Question 5

(a) use speed = distance / time: 1000 m / (5*60) s or show 1000/300	**M1**
(a) 3.33 m/s awrt cao	**A1**

(a) Answer: 3.33 m/s

(b) runner returns towards the start (distance decreases) or turns back oe	**B1**

(b) Answer: The runner turns and runs back towards the start; the distance decreases.

(c) 4000 m cao	**A1**

(c) Answer: 4000 m

Question 6

50 minutes = 5/6 hours or 16 x 60 / 50	**M1**
19.2 km/h	**A1**

Answer: 19.2 km/h

Question 7

Anna's head start 2 km	**M1**
closing speed 4 km/h	**M1**
time to catch up 30 minutes	**M1**
09:42	**A1**

Answer: 09:42

Question 8

closing speed 24 km/h	**M1**
time = 18 / 24 hours	**M1**
4.5 km	**A1**

Answer: 4.5 km

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