4.4 Real Life and Distance Time Graphs: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A bus journey has three parts: first leg 10 km in 20 minutes, then a 10 minute stop, then second leg 20 km in 40 minutes.

(a) Work out the speed of the bus during the first leg in km/h. **(1)**

.....

(b) How long was the bus stopped? **(1)**

.....

(c) Work out the average speed for the whole journey, including the stop. Give your answer correct to 2 decimal places. **(2)**

.....

(Total for Question 1 is 4 marks)

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2 A family drive starts at 0 km. Their distance-time graph is: 0 to 1 hour they drive 30 km; 1 to 1.5 hours they stop for a break; 1.5 to 2.5 hours they drive and reach 95 km at 2.5 hours.

(a) Work out their average speed during the driving periods only (ignore the break time). Give your answer in km/h. **(2)**

.....

(b) Give the total time from start until they reach 95 km. **(1)**

(Total for Question 2 is 3 marks)

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3 A cyclist travels 44 km in 48 minutes.
Work out the average speed in kilometres per hour.

(Total for Question 3 is 2 marks)

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4 The distance-time graph of a bus is a straight line from the point (0 minutes, 5 km) to the point (20 minutes, 20 km).
Work out the speed of the bus in kilometres per hour.

(Total for Question 4 is 3 marks)

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5 A runner travels 32 km in 12 minutes.
Work out the average speed in kilometres per hour.

(Total for Question 5 is 2 marks)

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6 Anna leaves home at 09:00 and cycles along a straight road at 20 km/h. Ben leaves the same home at 09:11 and follows her along the same road at 30 km/h.
At what time does Ben catch up with Anna?

(Total for Question 6 is 4 marks)

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7 The distance-time graph of a bus is a straight line from the point (0 minutes, 2 km) to the point (40 minutes, 14 km).
Work out the speed of the bus in kilometres per hour.

(Total for Question 7 is 3 marks)

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8 A coach travels 13 km in 40 minutes.
Work out the average speed in kilometres per hour.

(Total for Question 8 is 2 marks)

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9 Mia cycles 30 km to the market town in 30 minutes. She rests for 30 minutes. She then cycles back the same way in 30 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 9 is 3 marks)

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10 Two towns A and B are 14 km apart on a straight road. Priya walks from A towards B at 19 km/h. At the same time Omar walks from B towards A at 9 km/h.
How far from A are they when they meet?

(Total for Question 10 is 3 marks)

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11 Mia cycles 27 km to the market town in 50 minutes. She rests for 30 minutes. She then cycles back the same way in 45 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 11 is 3 marks)

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12 Mia cycles 23 km to the lake in 40 minutes. She rests for 20 minutes. She then cycles back the same way in 40 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 12 is 3 marks)

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13 Mia cycles 12 km to the beach in 20 minutes. She rests for 10 minutes. She then cycles back the same way in 50 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 13 is 3 marks)

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14 Mia cycles 11 km to the beach in 60 minutes. She rests for 30 minutes. She then cycles back the same way in 30 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 14 is 3 marks)

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15 Mia cycles 23 km to the market town in 45 minutes. She rests for 20 minutes. She then cycles back the same way in 60 minutes.
Work out her average speed for the whole journey in kilometres per hour.

(Total for Question 15 is 3 marks)

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16 Anna leaves home at 09:00 and cycles along a straight road at 10 km/h. Ben leaves the same home at 09:22 and follows her along the same road at 20 km/h.
At what time does Ben catch up with Anna?

(Total for Question 16 is 4 marks)

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Mark scheme · 4.4 Real Life and Distance Time Graphs: 1-hour Pack

Question 1

(a) 30 km/h cao **B1**

(a) Answer: 30 km/h

(b) 10 minutes cao **B1**

(b) Answer: 10 minutes

(c) total distance = 10 + 20 = 30 km; total time = 20 + 10 + 40 = 70 min = 70/60 h; use speed = distance/time **M1**

(c) 25.71 km/h awrt cao **A1**

(c) Answer: 25.71 km/h

Question 2

(a) find total driving time = 0-1 and 1.5-2.5 so driving time = 1 + 1 = 2 h; use speed = distance / driving time **M1**

(a) 47.5 km/h awrt **A1**

(a) Answer: 47.5 km/h

(b) 2.5 hours cao **B1**

(b) Answer: 2.5 hours

Question 3

48 minutes = 0.8 hours or 44 x 60 / 48 **M1**

55 km/h **A1**

Answer: 55 km/h

Question 4

gradient = change in distance / change in time **M1**

converts minutes to hours **M1**

45 km/h **A1**

Answer: 45 km/h

Question 5

12 minutes = 0.2 hours or 32 x 60 / 12 **M1**

160 km/h **A1**

Answer: 160 km/h

Question 6

Anna's head start 11/3 km **M1**

closing speed 10 km/h **M1**

time to catch up 22 minutes **M1**

09:33 **A1**

Answer: 09:33

Question 7

gradient = change in distance / change in time **M1**

converts minutes to hours **M1**

18 km/h **A1**

Answer: 18 km/h

Question 8

40 minutes = 2/3 hours or 13 x 60 / 40 **M1**

19.5 km/h **A1**

Answer: 19.5 km/h

Question 9

total distance 60 km **M1**

total time 90 minutes = 1.5 hours **M1**

40 km/h **A1**

Answer: 40 km/h

Question 10

closing speed 28 km/h **M1**

time = 14 / 28 hours **M1**

9.5 km **A1**

Answer: 9.5 km

Question 11

total distance 54 km **M1**

total time 125 minutes = 25/12 hours **M1**

25.92 km/h **A1**

Answer: 25.92 km/h

Question 12

total distance 46 km **M1**

total time 100 minutes = 5/3 hours **M1**

27.6 km/h **A1**

Answer: 27.6 km/h

Question 13

total distance 24 km **M1**

total time 80 minutes = 4/3 hours **M1**

18 km/h **A1**

Answer: 18 km/h

Question 14

total distance 22 km **M1**

total time 120 minutes = 2 hours **M1**

11 km/h **A1**

Answer: 11 km/h

Question 15

total distance 46 km **M1**

total time 125 minutes = 25/12 hours **M1**

22.08 km/h **A1**

Answer: 22.08 km/h

Question 16

Anna's head start 11/3 km **M1**

closing speed 10 km/h **M1**

time to catch up 22 minutes **M1**

09:44 **A1**

Answer: 09:44

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