Speed, Distance and Time

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1) November 2013 V1

2 Emily cycles along a path for 2 minutes.

She starts from rest and accelerates at a constant rate until she reaches a speed of 5 m/s after 40 seconds. She continues cycling at 5 m/s for 60 seconds.

She then decelerates at a constant rate until she stops after a further 20 seconds.

(a) On the grid, draw a speed-time graph to show Emily's journey.



(b) Find Emily's acceleration.

- (c) Calculate Emily's average speed for the journey.

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Answer(*c*) m/s [4]

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(c) The diagram shows the speed-time graph for a car travelling between two sets of traffic lights.



(i) Calculate the deceleration of the car for the last 5 seconds of the journey.

Answer(c)(i) m/s² [1]

(ii) Calculate the average speed of the car between the two sets of traffic lights.

www.Q8Maths.com Answer(c)(ii) m/s [4]

3) June 2014 V1

2 Ali leaves home at 1000 to cycle to his grandmother's house. He arrives at 1300. The distance-time graph represents his journey.



4) November 2014 V1

2 (c) The diagram shows the speed-time graph for a car travelling along a road for *T* seconds.



To begin with the car accelerated at 0.75 m/s^2 for 20 seconds to reach a speed of v m/s.

(i) Show that the speed, v, of the car is 15 m/s.

Answer(c)(i)

(ii) The total distance travelled is 1.8 kilometres.

Calculate the total time, *T*, of the journey.

Answer(c)(ii) seconds [4]

(d) Asma runs 22 kilometres, correct to the nearest kilometre. She takes $2\frac{1}{2}$ hours, correct to the nearest half hour.

Calculate the upper bound of Asma's speed.

Answer(*d*) km/h [3]

[1]

5) March 2016 V2

3 (b) Davinder draws a speed-time graph for his bus journey to the market.



- (i) the acceleration of the bus during the first 200 seconds,
- (ii) the total distance travelled by the bus,

(iii) the average speed of the bus for the whole journey.

..... m/s^2 [1]

6) June 2019 V1

- 11 Brad travelled from his home in New York to Chamonix.
 - He left his home at 1630 and travelled by taxi to the airport in New York. This journey took 55 minutes and had an average speed of 18 km/h.
 - He then travelled by plane to Geneva, departing from New York at 2215. The flight path can be taken as an arc of a circle of radius 6400 km with a sector angle of 55.5°. The local time in Geneva is 6 hours ahead of the local time in New York. Brad arrived in Geneva at 1125 the next day.
 - To complete his journey, Brad travelled by bus from Geneva to Chamonix. This journey started at 13 00 and took 1 hour 36 minutes. The average speed was 65 km/h. The local time in Chamonix is the same as the local time in Geneva.

Find the overall average speed of Brad's journey from his home in New York to Chamonix. Show all your working and give your answer in km/h.

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