3.13 Motion: Speed, Velocity and Acceleration: 10-minute Pack

AQA 8464 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Chloe runs 300 m along a straight track in a time of 250 s. Use average speed = distance / time to calculate her average speed.

(Total for Question 1 is 2 marks)

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2 The average speed of a car driving through a UK town centre is about 13 m/s.

(a) Convert this speed to km/h, using 1 m/s = 3.6 km/h. **(1)**

.....

(b) A driver claims this speed is 'about 30 miles per hour'. Given that 1 km/h is approximately 0.62 mph, calculate this speed in mph and comment on whether the driver's claim is reasonable. **(2)**

.....

(Total for Question 2 is 3 marks)

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3 Motion graphs and their gradients carry specific physical meanings.

(a) State what is represented by the gradient of a distance-time graph. **(1)**

(b) State what is represented by the gradient of a velocity-time graph. **(1)**

(c) State what is represented by the area under a velocity-time graph. **(1)**

(d) State the SI unit of acceleration. **(1)**

(Total for Question 3 is 4 marks)

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Mark scheme · 3.13 Motion: Speed, Velocity and Acceleration: 10-minute Pack

Question 1

substitutes: speed = 300 / 250 **M1**

1.2 m/s cao **A1**

Answer: 1.2 m/s

Question 2

(a) 46.8 km/h (accept 47 km/h to 2 s.f.) **B1**

(a) Answer: 46.8 km/h (47 km/h to 2 s.f.)

(b) ft substitutes: 46.8 x 0.62 (allow use of their part (a) answer) **M1**

(b) awrt 29 mph, with a valid comment, e.g. 'this is close to the claimed 30 mph (within about 1 mph), so the claim is reasonable', oe **B1**

(b) Answer: Approximately 29 mph; this is close to the driver's claim of 30 mph, so the claim is reasonable.

Question 3

(a) speed (oe average speed) **B1**

(a) Answer: Speed

(b) acceleration **B1**

(b) Answer: Acceleration

(c) displacement from the signed area; distance travelled is the sum of the absolute areas when velocity changes sign **B1**

(c) Answer: Displacement (signed area)

(d) m/s^2 (oe metres per second squared) **B1**

(d) Answer: m/s^2

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