3.2 Distance-Time and Velocity-Time Graphs: 10-minute Pack

Total Marks

EDEXCEL 4PH1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Describe the motion shown by a distance-time graph that is a horizontal straight line at 20 m from the origin for all times between 0 s and 10 s.

(Total for Question 1 is 2 marks)

2 Read off from the distance-time graph of a pedestrian walking along a straight path: at 0 minutes the distance is 0 m; at 5 minutes the distance is 300 m. State the average speed of the pedestrian between 0 and 5 minutes in m/s.

(Total for Question 2 is 3 marks)

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3 A distance-time graph shows an object moving away from the origin with constant speed, covering 90 m in 30 s. Read off the speed from the graph in m/s.

(Total for Question 3 is 2 marks)

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4 A cyclist starts from rest and accelerates uniformly so the distance-time graph is a curve. Explain how the shape of the curve shows the cyclist is accelerating.

(Total for Question 4 is 3 marks)

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Mark scheme · 3.2 Distance-Time and Velocity-Time Graphs: 10-minute Pack

Question 1

states that distance does not change with time	**B1**
concludes the object is stationary at 20 m from the origin	**B1**

Answer: The object is stationary; it stays at 20 m from the origin for the whole 0 s to 10 s interval.

Question 2

forms change in distance over change in time fraction, (300 - 0) / (5 min)	**M1**
converts 5 minutes to seconds or converts result to m/s, e.g. 5 min = 300 s	**M1**
gives final answer 1.0 m/s cao	**A1**

Answer: 1.0 m/s

Question 3

uses speed = distance / time = 90 / 30	**M1**
gives speed = 3.0 m/s cao	**A1**

Answer: 3.0 m/s

Question 4

notes the curve gets steeper with time	**B1**
links steeper gradient to increasing speed	**B1**
concludes speed is increasing so the cyclist is accelerating	**B1**

Answer: The curve becomes steeper over time, so the gradient, which equals speed, increases. Therefore the cyclist's speed increases and the cyclist is accelerating.

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