Extra Content for Foundation GCSE

110. Understanding Speed-Time Graphs and Connections to Acceleration, Speed, and Distance

Practice Questions

1. A car's speed-time graph has a constant gradient of 2 m/s². What does this represent?
2. A cyclist accelerates from 5 m/s to 15 m/s in 5 seconds. Find the acceleration.
3. A speed-time graph shows a flat horizontal line at 10 m/s. What does this mean?
4. A vehicle moves at 20 m/s for 10 seconds, then stops instantly. How far did it travel?
5. A speed-time graph has a gradient of -4 m/s². What does this mean?
6. Find the total distance covered in a speed-time graph where speed = 8 m/s for 6 seconds.
7. A car accelerates from 0 m/s to 20 m/s in 10 seconds. Find the gradient of the graph.
8. A bus moves at 12 m/s for 4 seconds, then accelerates to 24 m/s over 6 seconds. Find the total distance travelled.
9. A motorbike decelerates at 3 m/s² for 4 seconds from a speed of 18 m/s. What is its final speed?

Scenario Questions

1. A car accelerates from rest to 30 m/s in 6 seconds. Find the acceleration and the total distance travelled using a speed-time graph.
2. A cyclist starts at 10 m/s and maintains constant speed for 12 seconds before decelerating to stop over 4 seconds. Sketch and describe the graph.
3. A runner's speed-time graph shows a triangular area with a base of 8 seconds and a peak of 6 m/s. Calculate the total distance run.
4. A train moves at 20 m/s for 15 seconds, then slows down to rest over 5 seconds. Find the total distance travelled.
5. A jet takes off and follows a speed-time graph where it accelerates from 0 to 200 m/s in 20 seconds. Find its acceleration.
6. A speedboat moves at 30 m/s for 5 seconds, then accelerates to 50 m/s over 10 seconds. Find the total distance travelled.
7. A child on a scooter starts at 4 m/s and decelerates uniformly to rest over 6 seconds. Find the deceleration and the distance travelled.
8. A rocket accelerates at 10 m/s² from rest for 12 seconds, then moves at constant speed for another 5 seconds. Find the total distance covered.
9. A speed-time graph shows a car moving at 20 m/s for 8 seconds, then decelerating to stop in 4 seconds. Find the total distance travelled.
10. A lorry moves at 15 m/s for 10 seconds, then accelerates at 2 m/s² for 5 seconds. Find its final speed and total distance covered.

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Practice Questions

1. The gradient represents an acceleration of 2 m/s².
2. Acceleration: 2 m/s²
3. The cyclist is moving at a constant speed of 10 m/s.
4. Distance: 200 metres
5. The gradient represents a deceleration of 4 m/s².
6. Distance: 48 metres
7. Gradient: 2 m/s²
8. Total distance: 168 metres
9. Final speed: 6 m/s

Scenario Questions

1. Acceleration: 5 m/s²; Total distance: 90 metres
2. The graph has a horizontal line at 10 m/s for 12 seconds, then a straight line decreasing to 0 m/s over 4 seconds.
3. Total distance: 24 metres
4. Total distance: 350 metres
5. Acceleration: 10 m/s²
6. Total distance: 650 metres
7. Deceleration: 0.67 m/s²; Distance: 12 metres
8. Total distance: 840 metres
9. Total distance: 200 metres
10. Final speed: 25 m/s; Total distance: 212.5 metres