GCSE and IGCSE Physics: Speed, Velocity and Acceleration Worksheet

Year 10-11 · GCSE (AQA 4.5.6) and Cambridge IGCSE 0625 topic 1 · Exam-style questions

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 46

Section A: Speed and distance-time graphs [14 marks]

speed = distance ÷ time | acceleration = change in velocity ÷ time | $v^2 - u^2 = 2as$ | average speed = total distance ÷ total time

1 State the difference between speed and velocity. **[2]**

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2 Calculate each missing value. Show your working. **[4]**

Distance	Time	Speed
150 m	25 s	
	40 s	12 m/s
3600 m		6 m/s
2.4 km	10 min	

3 A cyclist travels 9 km in 30 minutes. Calculate her average speed in m/s. **[3]**

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4 A distance-time graph shows a straight sloping line, then a horizontal line, then a steeper sloping line. Describe the motion in each part. **[3]**

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5 Explain how the speed is found from a distance-time graph. **[2]**

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Section B: Acceleration and velocity-time graphs [17 marks]

6 Calculate each missing value. **[4]**

Change in velocity	Time taken	Acceleration
20 m/s	5 s	
	8 s	3 m/s^2
30 m/s		2.5 m/s^2
-12 m/s	4 s	

7 A car accelerates from rest to 24 m/s in 8 s, travels at constant speed for 10 s, then brakes to rest in 6 s.

(a) Calculate the acceleration in the first 8 s. **[2]**

(b) Calculate the deceleration while braking. **[2]**

(c) Calculate the distance travelled in the first 8 s (area under the graph). **[2]**

(d) Calculate the total distance travelled in the 24 s. **[3]**

(e) Calculate the average speed for the whole journey. **[2]**

8 State what the gradient and the area under a velocity-time graph represent. **[2]**

Section C: Equations of motion [15 marks]

9 A train accelerates uniformly from 10 m/s to 30 m/s over a distance of 400 m. Calculate its acceleration. **[3]**

10 A ball is dropped from rest and falls for 3.0 s. Calculate its speed after 3.0 s. ($g = 10\ m/s^2$) **[2]**

11 Calculate the distance the ball falls in 3.0 s, ignoring air resistance. **[2]**

12 A car travelling at 15 m/s brakes with a deceleration of 5 m/s^2. Calculate the braking distance. **[3]**

13 Explain why a skydiver reaches terminal velocity. **[3]**

14 Give two factors that increase the stopping distance of a car. **[2]**