

1.1 Motion Homework Questions

1. A cyclist rides along a road. Describe a method by which the average speed of the cyclist could be measured.

Your description must include the following:

- Measurements made
- Equipment used
- Any necessary calculations (3)

2. An indoor kart track hosts a racing competition. Describe how to find the average speed of a kart for one complete lap of the track. You must state the measurements that are made and how they are used. (3)

3. In a tennis match the player hits the ball to serve. The ball travels 24m from the server's racquet to the opponent's racquet at an average speed of 40 metres per second. Calculate the time taken. (3)

4. Cameras placed at 5km intervals along a stretch of road are used to record the average speed of a car.

The car is travelling on a road which has a speed limit of 100 km/h. The car travels a distance of 5 km in 2.5 minutes.

(a) Does the average speed of the car stay within the speed limit? You must justify your answer with a calculation. (3)

(b) At one point in the journey, the car speedometer records 90 km/h. Explain why the average speed for the entire journey is not always the same as the speed recorded on the car speedometer. (2)

5. A walker wears a pedometer. A pedometer is an instrument that measures the distance walked by counting the number of steps taken. The walker measures the distance of one step as 0.8m and enters it into the pedometer.



- (a) The walker completes 9000 steps during a walk. Calculate the distance travelled. (1)
- (b) The walker completes this walk in 80 minutes. What is the average speed of the walker in ms^{-1} ? (3)
- (c) Give one reason why the distance measured by the pedometer may not be accurate. (1)

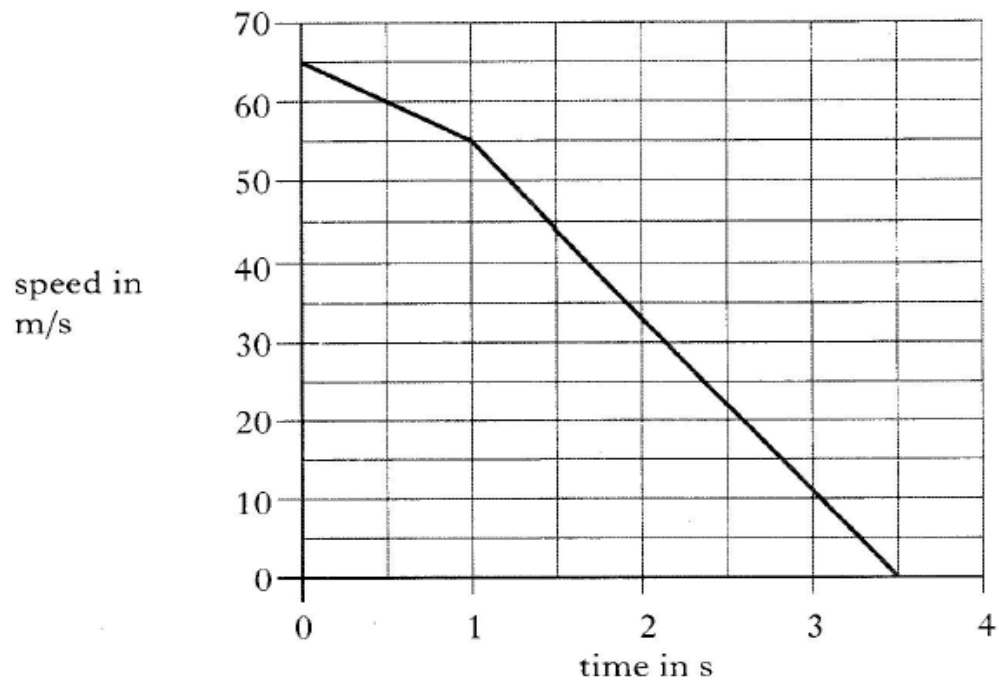
Q 6 A scientist studies a flea while it jumps. Starting from rest, the flea accelerates to 1.2 meters per second in a time of 0.001 seconds.

The flea has a mass of 0.0001 kilograms.

What is meant by the term 'acceleration'? (1)

Q7

The graph shows the motion of an aeroplane from the point when it touches down on the runway until it stops.



Calculate the distance travelled by the aeroplane on the runway.

(3)

Total Marks 23