

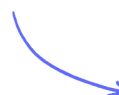
## Multiple Choice Questions

# 1.2 Motion

Speed & Velocity / Acceleration / Distance-Time Graphs / Speed-Time Graphs /  
Calculating Acceleration from Speed-Time Graphs / Freefall

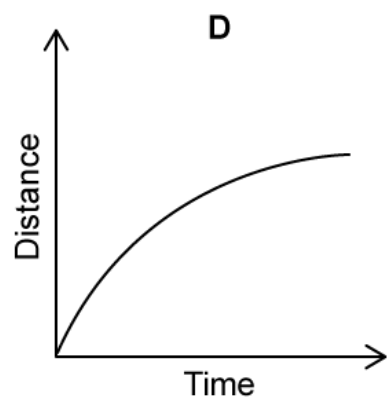
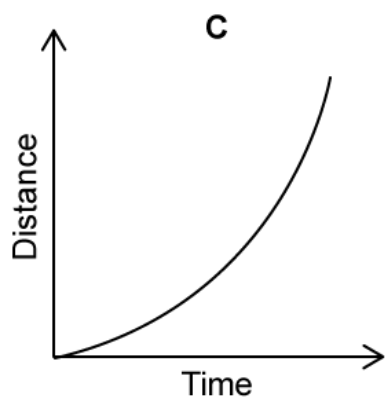
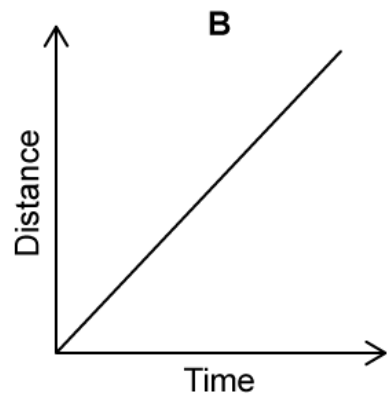
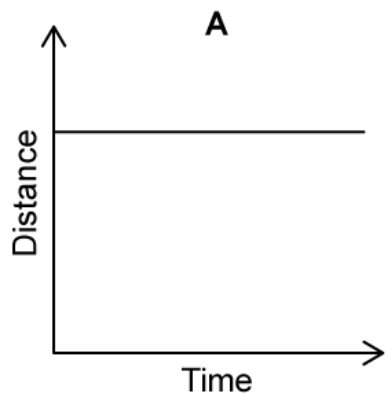
Easy (5 questions)	/5
Medium (9 questions)	/9
Hard (5 questions)	/5
<b>Total Marks</b>	<b>/19</b>

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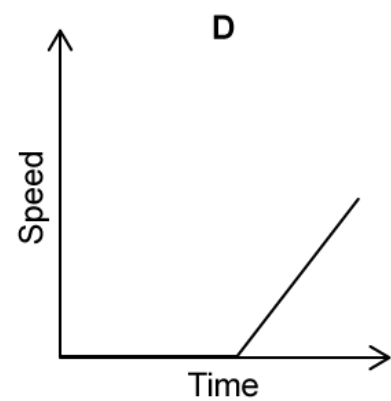
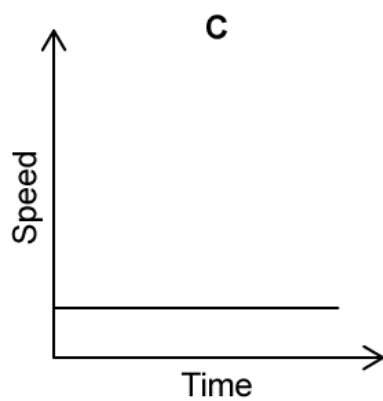
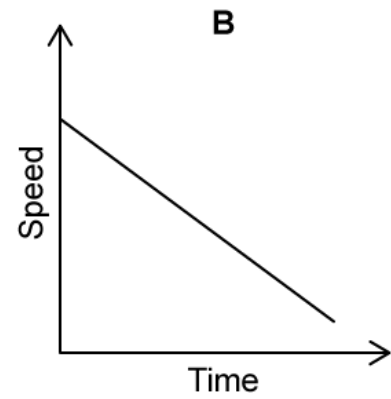
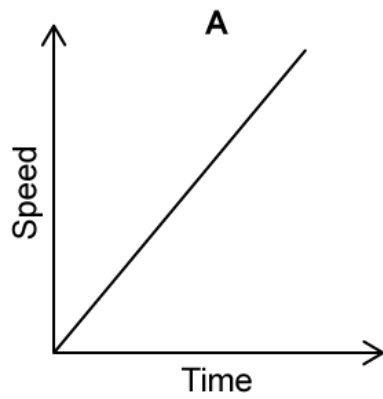
# Easy Questions

1 Which distance-time graph shows an object moving with constant speed?



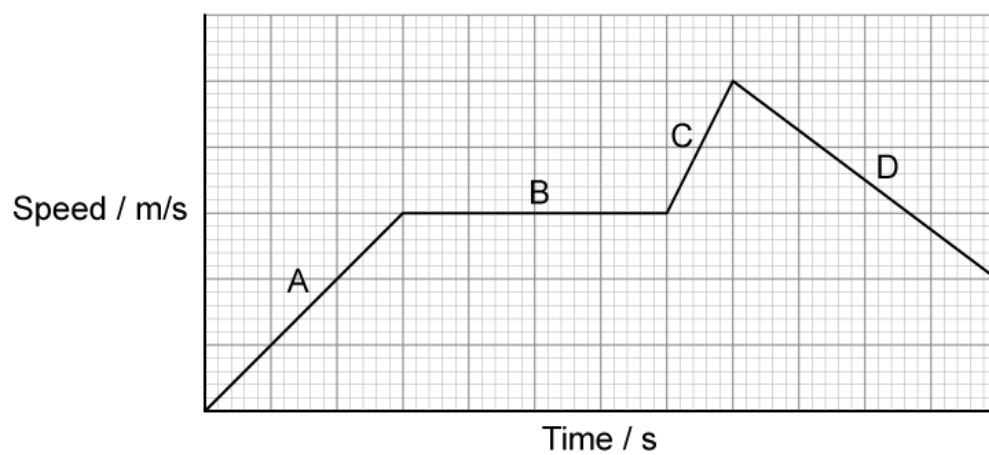
(1 mark)

2 Which speed-time graph shows an object moving with a constant speed?



(1 mark)

3 In which section of the graph is the most distance covered?



(1 mark)

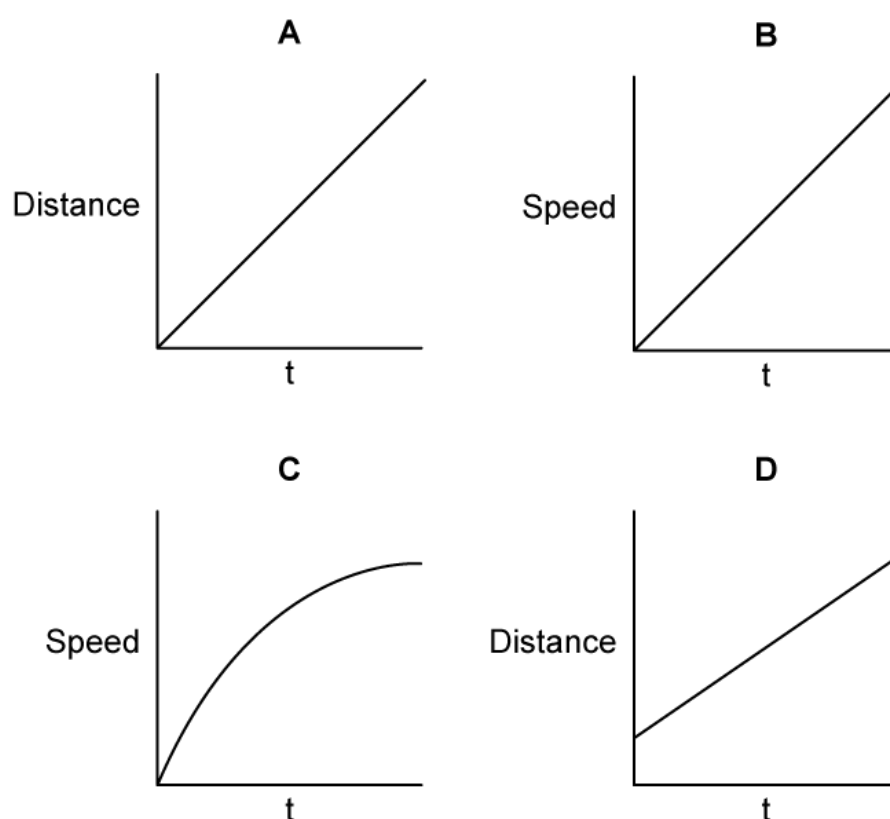
4 What is the speed of a bowling ball which travels down a 30 m lane in 2.5 seconds?

- A. 75 miles per hour
- B. 75 metres per second
- C. 12 metres per second
- D. 12 miles per hour

(1 mark)

5 A BASE jumper, initially at rest, falls from the top of El Capitan in Yosemite National Park. They reach terminal velocity before deploying their parachute.

Which graph represents their motion before they deploy their parachute?



(1 mark)

# Medium Questions

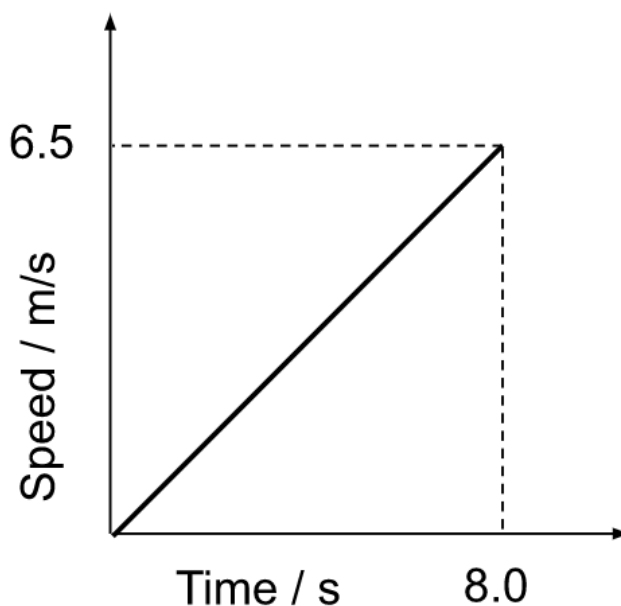
- 1 A car travels along a clear 10.0 km section of motorway in 6.0 minutes. It then drives through 3.0 km of roadworks in 3.0 minutes.

Which calculation will give the correct average speed for the journey?

- A.  $\frac{3.0}{3.0} = 1.00 \text{ km/min}$
- B.  $\frac{10.0}{6.0} = 1.67 \text{ km/min}$
- C.  $1.67 + 1.00 = 2.67 \text{ km/min}$
- D.  $\frac{13.0}{9.0} = 1.44 \text{ km/min}$

(1 mark)

- 2 The graph shows the journey undertaken by a car.



Which equation correctly gives the distance travelled by the car?

- A.  $\frac{6.5 \times 8.0}{2} = 26\text{m}$

**B.**  $6.5 \times 8.0 = 52 \text{ m}$

**C.**  $\frac{6.5}{8.0} = 0.81 \text{ m}$

**D.**  $\frac{8.0}{6.5} = 1.2 \text{ m}$

**(1 mark)**

- 3** During a Go Karting race, a car does 8 laps of a 300 m course. It takes 4.0 minutes to complete the race.

What was the average speed of the Go Kart?

**A.** 75 m/s

**B.** 10 m/s

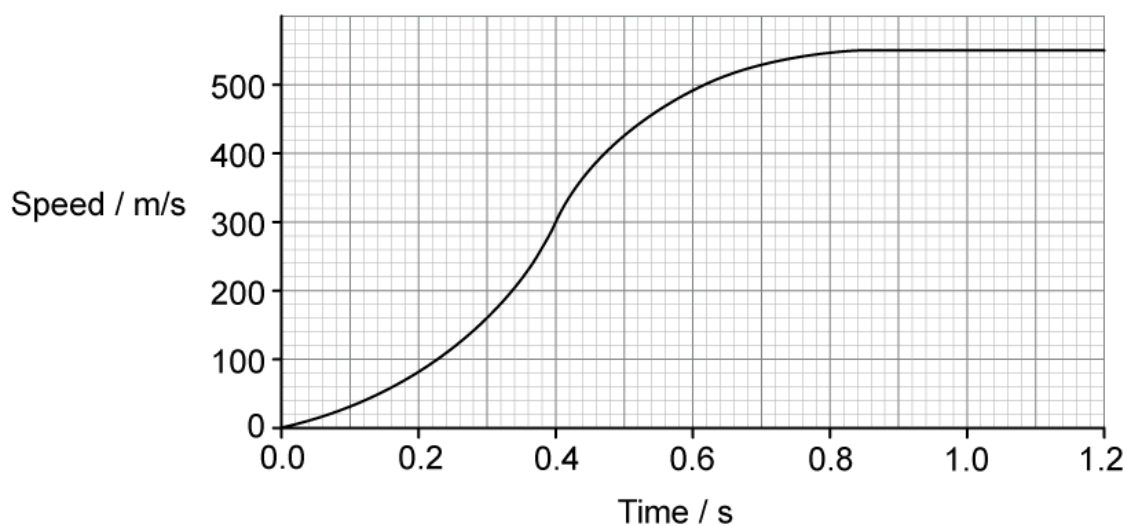
**C.** 1.25 m/s

**D.** 600 m/s

**(1 mark)**

- 4** A charged particle is accelerated when passing through an electric field.

What is the acceleration of the particle at 0.4 s?



**A.**  $2.0 \times 10^3 \text{ m/s}^2$

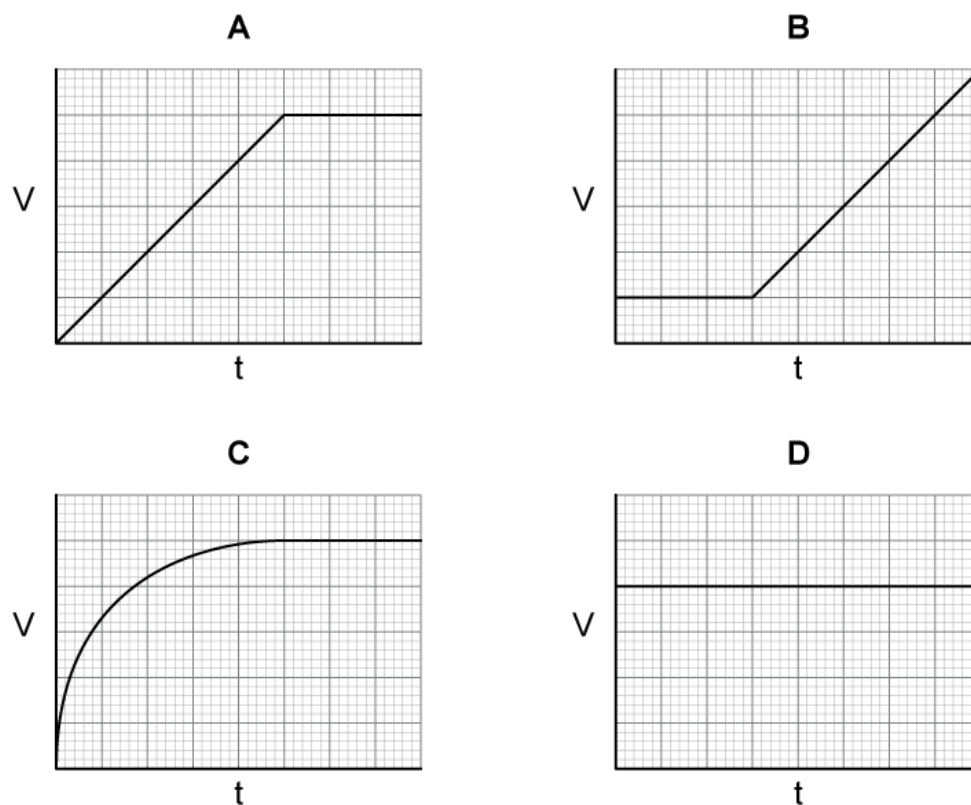
**B.**  $2.5 \text{ m/s}^2$

**C.**  $2.5 \times 10^{-3} \text{ m/s}^2$

**D.**  $2.0 \times 10^{-3} \text{ m/s}^2$

**(1 mark)**

- 5** Four speed-time graphs have axes with the same scales. Each large square has a height of  $1 \text{ m/s}$  and width of  $1 \text{ s}$ .

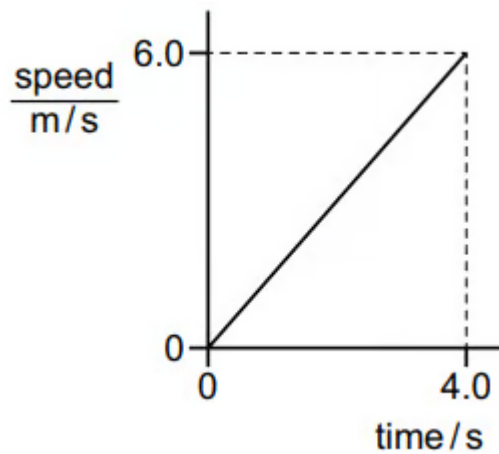


Which graph shows the greatest distance travelled?

**(1 mark)**

- 6** The diagram shows the speed-time graph for an object moving with constant

acceleration.

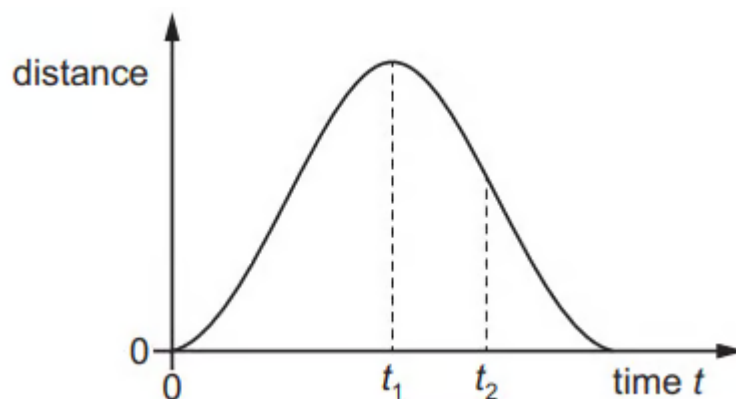


What is the distance travelled in the first 4.0s?

- A.** 0.67 m
- B.** 1.5 m
- C.** 12 m
- D.** 24 m

(1 mark)

- 7** A train sets off from a station at time  $t = 0$ . The graph shows how the distance between the train and the station varies with time.



Which statement about the movement of the train between time  $t_1$  and  $t_2$  is correct?

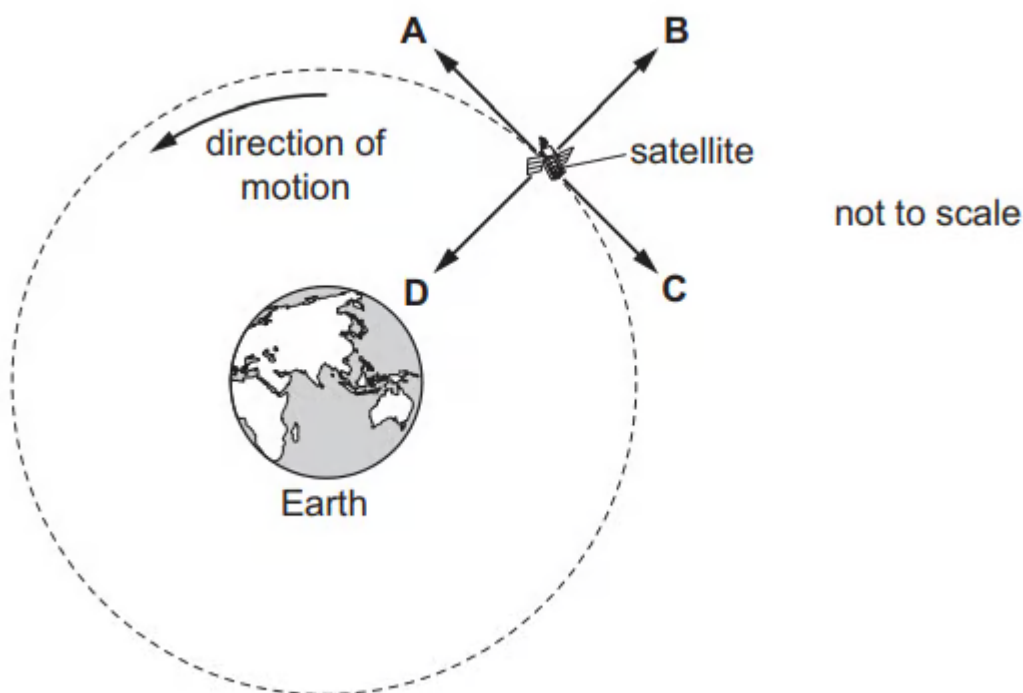
- A.** Its speed is decreasing and it is moving away from the station.



- B.** Its speed is decreasing and it is moving towards the station.
- C.** Its speed is increasing and it is moving away from the station.
- D.** Its speed is increasing and it is moving towards the station.

**(1 mark)**

- 8** A satellite is shown moving around the Earth in a circular path at a constant speed.



Which arrow shows the direction of the force on the satellite?

**(1 mark)**

- 9** A skydiver is falling at terminal velocity.



Which row describes the acceleration of the skydiver and the velocity of the skydiver?

	Acceleration of the skydiver	Velocity of the skydiver
<b>A</b>	downwards	constant
<b>B</b>	downwards	zero
<b>C</b>	zero	constant
<b>D</b>	zero	zero

(1 mark)

# Hard Questions

- 1 A cannonball is dropped from a three story building.

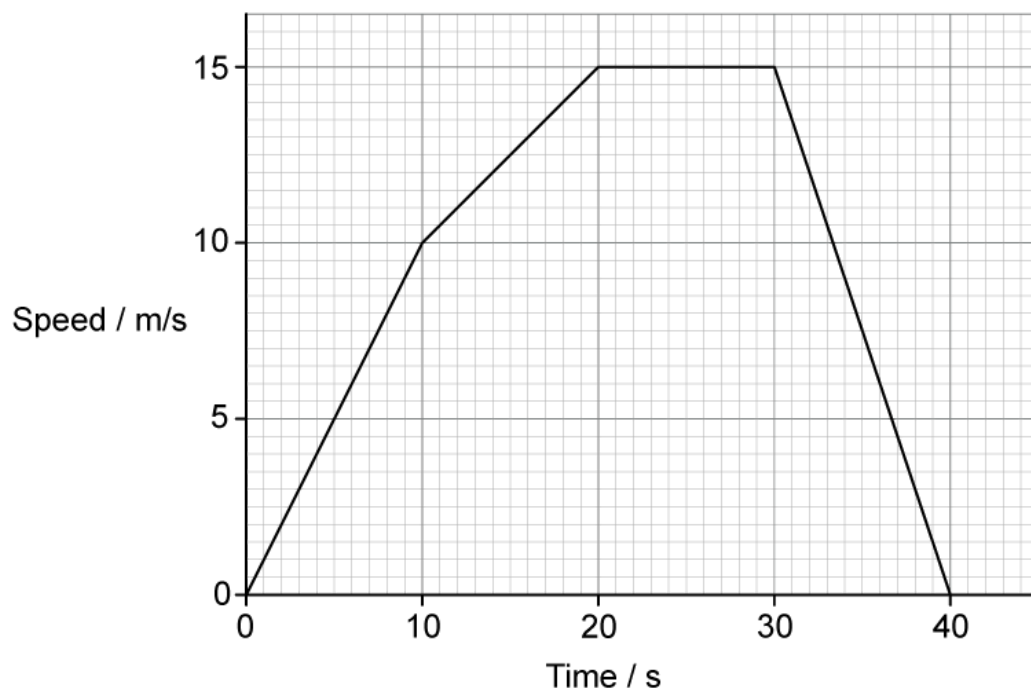
Which row of the table correctly describes both the speed and the acceleration of the cannonball as it falls?

You can ignore air resistance for this question.

	Speed	Acceleration
A	constant	constant
B	increasing	constant
C	increasing	increasing
D	constant	increasing

(1 mark)

2 The graph shows the motion of a motorbike.



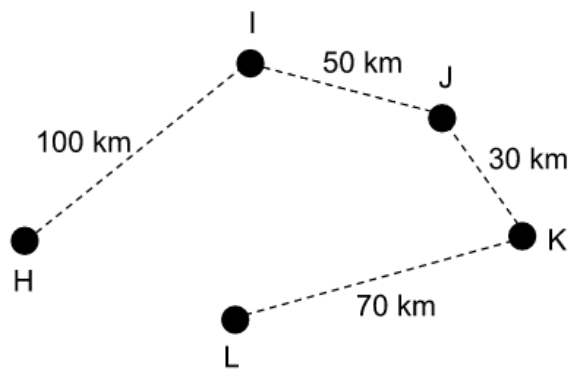
What is the distance travelled by the motorbike while it is moving at a constant speed?

- A. 150 m
- B. 50 m
- C. 300 m
- D. 750 m

(1 mark)

3 A helicopter flies the route shown below.

It stops at point I for 30 minutes to pick up some cargo.



The total time the helicopter takes between taking off from **H** and landing at **L** is 4.0 hours.

Calculate the average speed of the helicopter **when it is flying**.

- A.** 55.6 km/h
- B.** 250 km/h
- C.** 62.5 km/h
- D.** 71.4 km/h

**(1 mark)**

- 4** A man claps in a forest. There is nobody around to hear the sound.

However, there is a very flat cliff face some distance away, and the man hears an echo from the clap 0.84 s later.

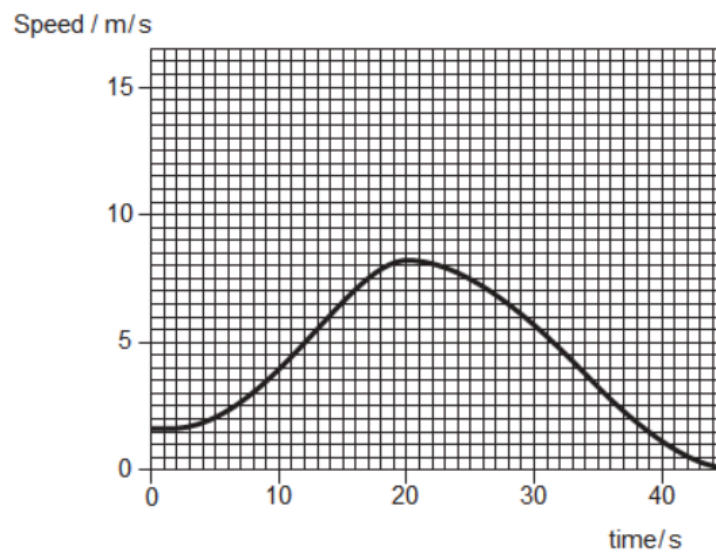
The speed of sound in air is 343 m/s.

How far away was the man from the cliff?

- A.** 408 m
- B.** 288 m
- C.** 144 m
- D.** 204 m

**(1 mark)**

5 The graph shows the speed-time graph of a cyclist who is moving in a straight line.



What is the acceleration of the cyclist at a time of 20 seconds?

- A.  $0.5 \text{ m/s}^2$
- B.  $-0.5 \text{ m/s}^2$
- C.  $0 \text{ m/s}^2$
- D.  $11.5 \text{ m/s}^2$

(1 mark)