

1.2 Motion

Question Paper

Level	IGCSE
Subject	Physics (0625)
Exam Board	Cambridge International Examinations(CIE)
Topic	General Physics
Sub Topic	1.2 Motion
Booklet	Question Paper

Time Allowed: 45 minutes

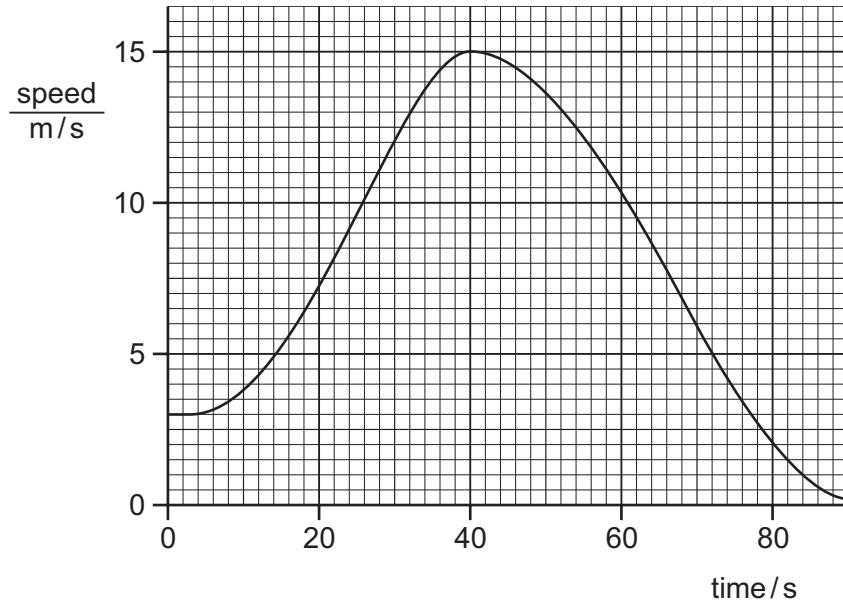
Score: /37

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

- 1 The speed-time graph shown is for a car moving in a straight line.

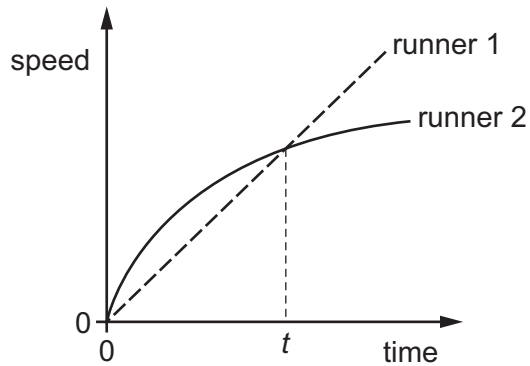


What is the acceleration of the car when the time is 40 s?

- A 0 m/s^2 B $\frac{15-3}{40} \text{ m/s}^2$ C $\frac{15}{40} \text{ m/s}^2$ D $(15-3) \text{ m/s}^2$

- 2 Two runners take part in a race.

The graph shows how the speed of each runner changes with time.



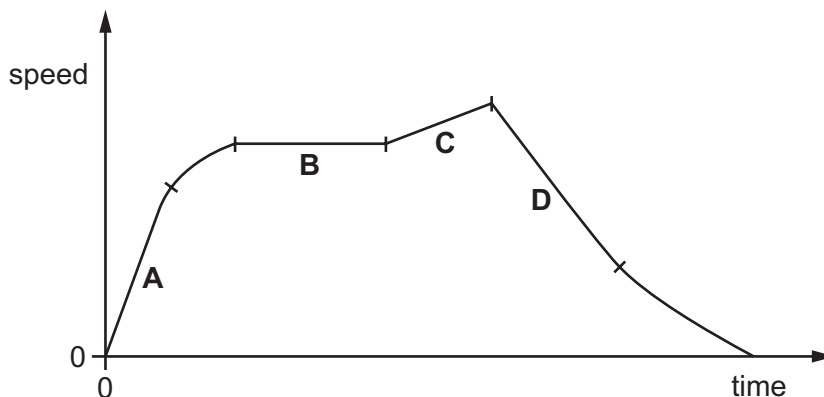
What does the graph show about the runners at time t ?

- A Both runners are moving at the same speed.
 B Runner 1 has zero acceleration.
 C Runner 1 is overtaking runner 2.
 D Runner 2 is slowing down.

- 3 A car travels along a straight road.

The speed-time graph for this journey is shown.

During which labelled part of the journey is the resultant force on the car zero?



- 4 A large stone is dropped from a bridge into a river. Air resistance can be ignored.

Which row describes the acceleration and the speed of the stone as it falls?

	acceleration of the stone	speed of the stone
A	constant	constant
B	constant	increasing
C	increasing	constant
D	increasing	increasing

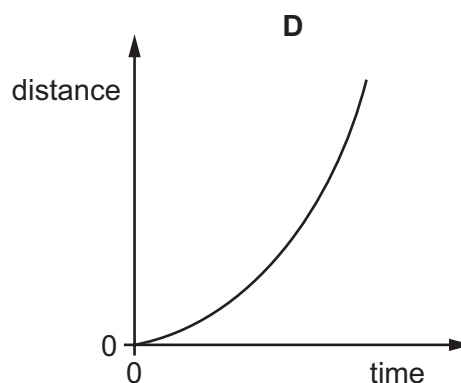
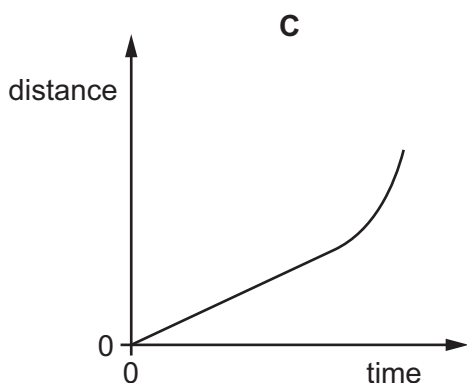
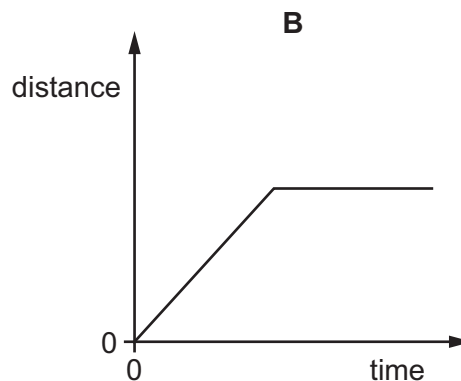
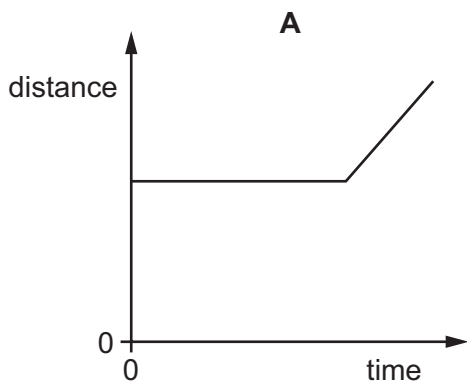
- 5 Below are four statements about acceleration.

Which statement is **not** correct?

- A** Acceleration always involves changing speed.
- B** Changing direction always involves acceleration.
- C** Changing speed always involves acceleration.
- D** Circular motion always involves acceleration.

- 6 An object moves at a constant speed for some time, then begins to accelerate.

Which distance-time graph shows this motion?



- 7 A heavy object is released near the surface of the Earth and falls freely. Air resistance can be ignored.

Which statement about the acceleration of the object due to gravity is correct?

- A** The acceleration depends on the mass of the object.
- B** The acceleration depends on the volume of the object.
- C** The acceleration is constant.
- D** The acceleration is initially zero and increases as the object falls.

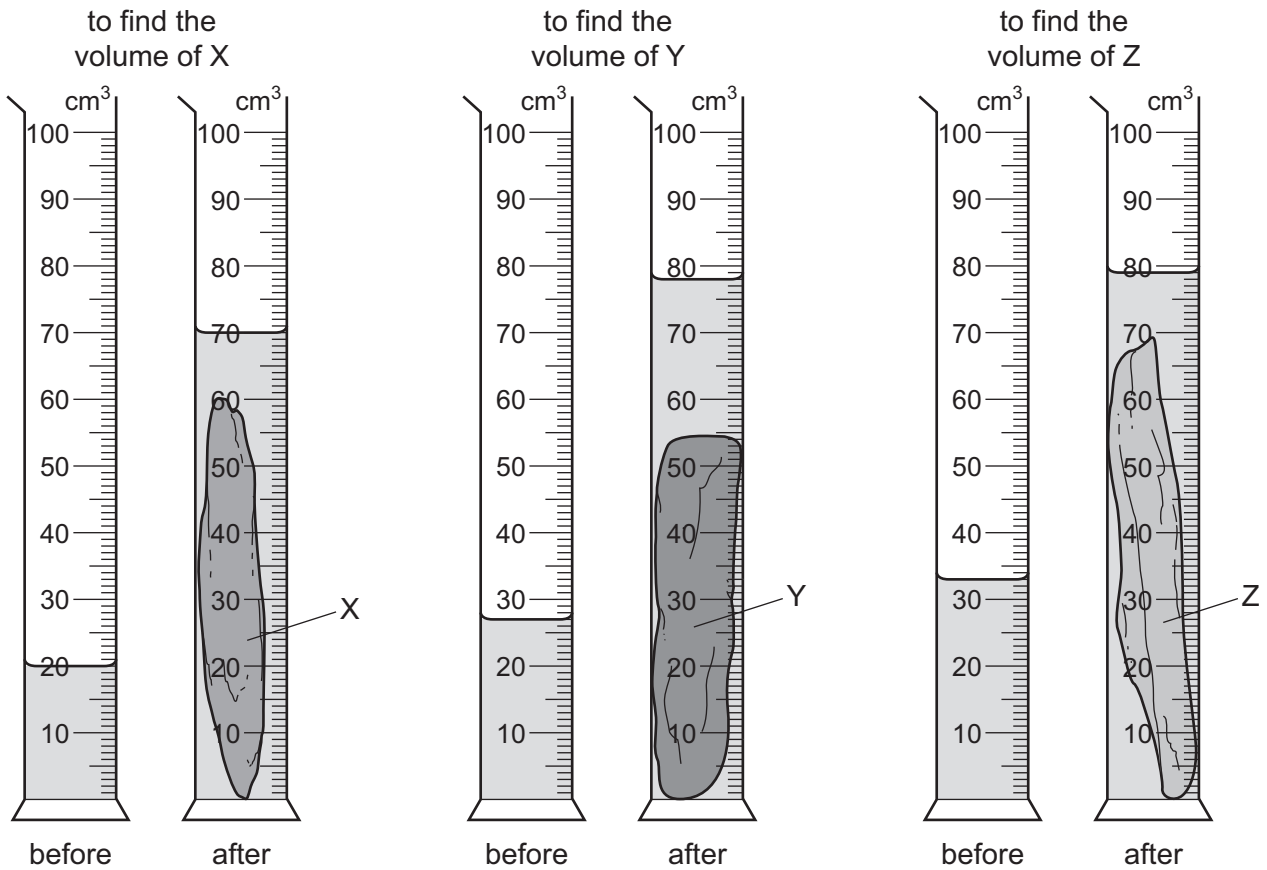
- 8 An object is released from rest and falls to Earth. During its fall, the object is affected by air resistance. The air resistance eventually reaches a constant value.

Which description about successive stages of the motion of the object is correct?

- A constant acceleration, then constant deceleration
- B constant deceleration, then zero acceleration
- C decreasing acceleration, then constant deceleration
- D decreasing acceleration, then zero acceleration

- 9 A geologist compares the volumes of three rocks, X, Y and Z. Three measuring cylinders contain different volumes of water. He places each rock into one of the measuring cylinders.

The diagrams show the measuring cylinders before and after the rocks are put in.

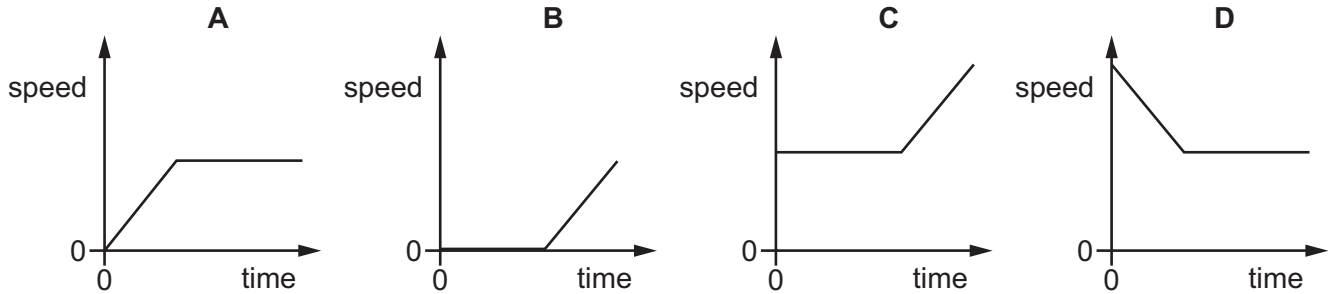


Which row shows the volumes of X, Y and Z in order, from largest to smallest?

	largest volume	→	smallest volume
A	X	Z	Y
B	Y	X	Z
C	Y	Z	X
D	Z	Y	X

- 10 A car moves with constant speed and then constant acceleration.

Which graph is the speed-time graph for the car?



- 11 What does the area under a speed-time graph represent?

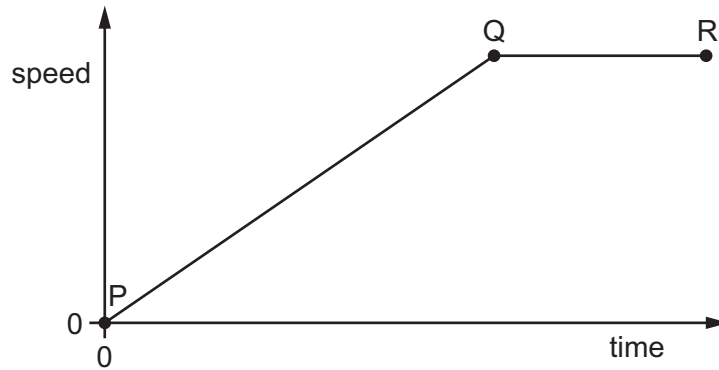
- A** acceleration
- B** average speed
- C** deceleration
- D** distance travelled

- 12 A car travels 100 km. The journey takes two hours. The highest speed of the car is 80 km/h, and the lowest speed is 40 km/h.

What is the average speed for the journey?

- A** 40 km/h
- B** 50 km/h
- C** 60 km/h
- D** 120 km/h

13 The speed-time graph shows the motion of a car.



Which row describes the motion?

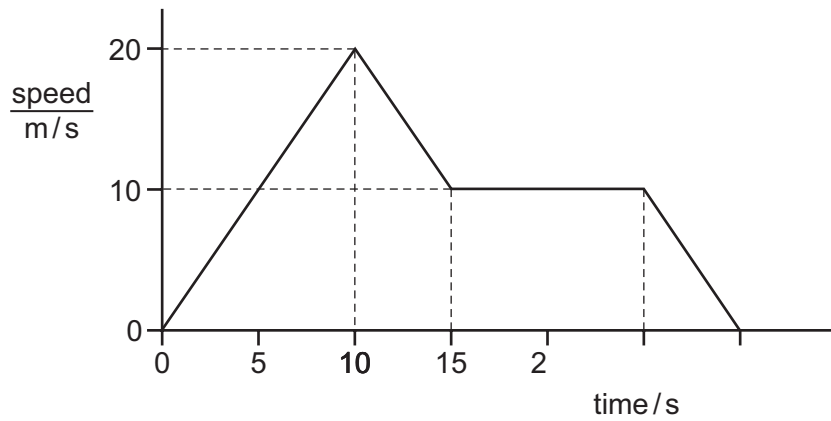
	between P and Q	between Q and R
A	accelerating	moving at constant speed
B	accelerating	not moving
C	moving at constant speed	decelerating
D	moving at constant speed	not moving

14 A car travels 100 km. The journey takes two hours. The highest speed of the car is 80 km/h, and the lowest speed is 40 km/h.

What is the average speed for the journey?

- A** 40 km/h **B** 50 km/h **C** 60 km/h **D** 120 km/h

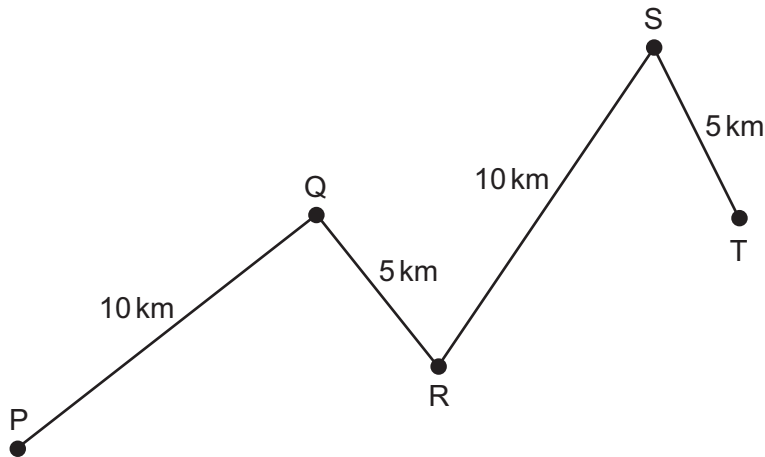
15 The graph represents the motion of a car.



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

- A** 100 m **B** 150 m **C** 250 m **D** 300 m

16 A car travels along the route PQRST in 30 minutes.



What is the average speed of the car?

- A** 10 km/hour **B** 20 km/hour **C** 30 km/hour **D** 60 km/hour

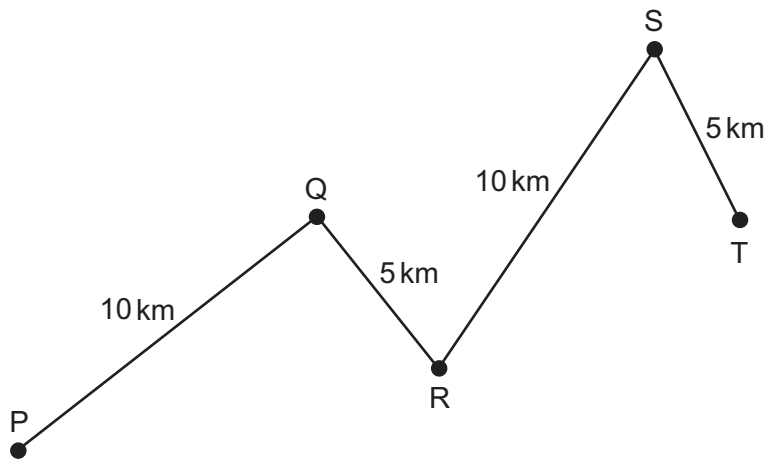
17 The table shows the readings on a car speedometer at 5 second intervals.

time / s	speed km/h
0	0
5	30
10	50
15	60
20	65

Which row describes the speed and the acceleration of the car?

	speed	acceleration
A	decreasing	zero
B	decreasing	not zero
C	increasing	zero
D	increasing	not zero

18 A car travels along the route PQRST in 30 minutes.

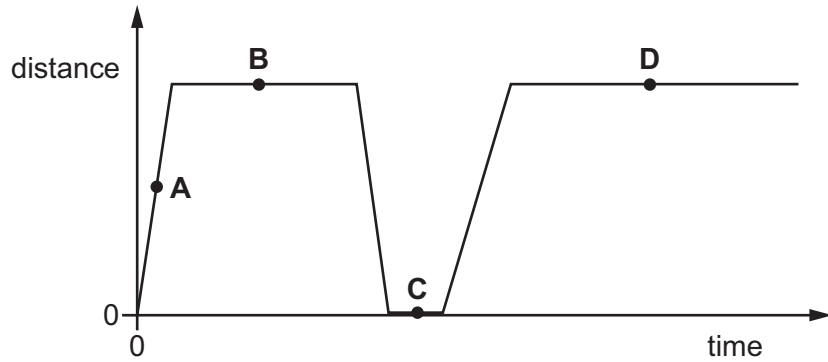


What is the average speed of the car?

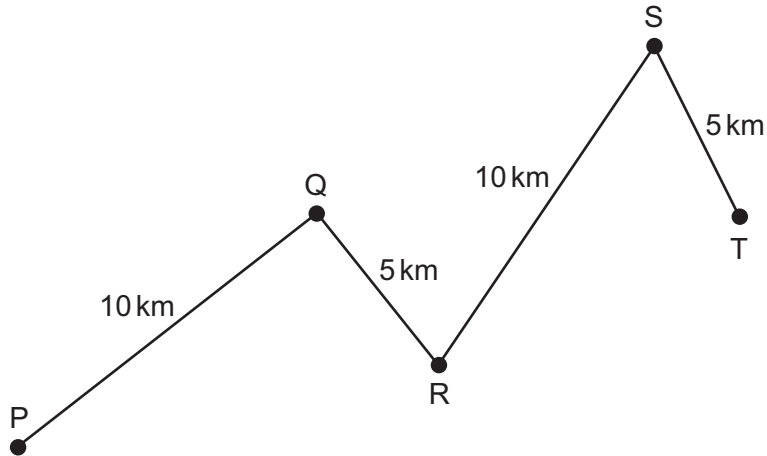
- A** 10 km/hour **B** 20 km/hour **C** 30 km/hour **D** 60 km/hour

19 The diagram shows the distance-time graph for a car.

At which labelled point is the car moving with constant speed?



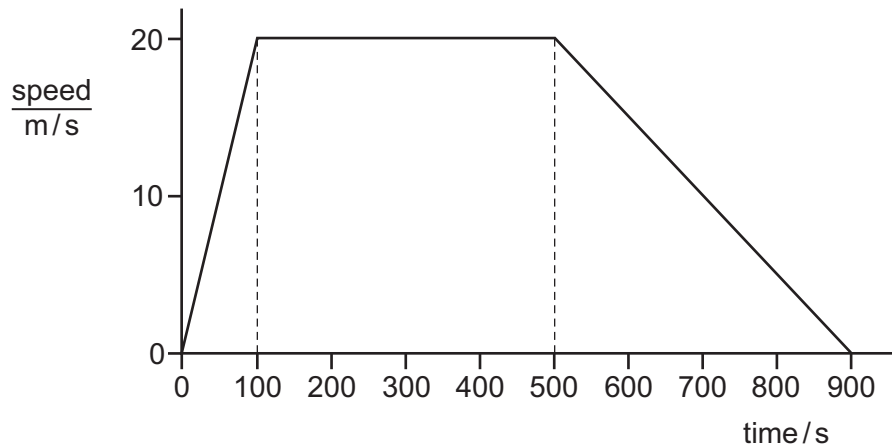
20 A car travels along the route PQRST in 30 minutes.



What is the average speed of the car?

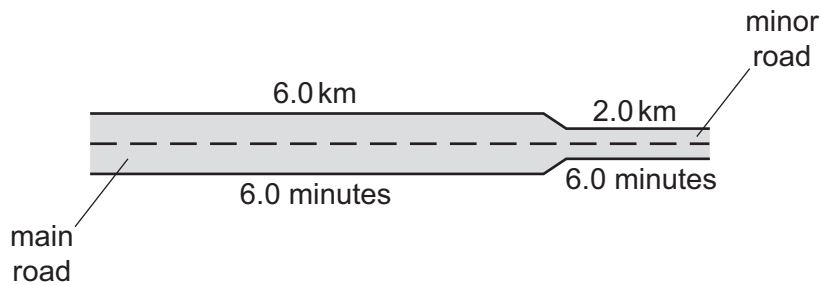
- A** 10 km/hour **B** 20 km/hour **C** 30 km/hour **D** 60 km/hour

- 21 The graph represents the motion of a train travelling between two stations.



Which statement about the train is correct?

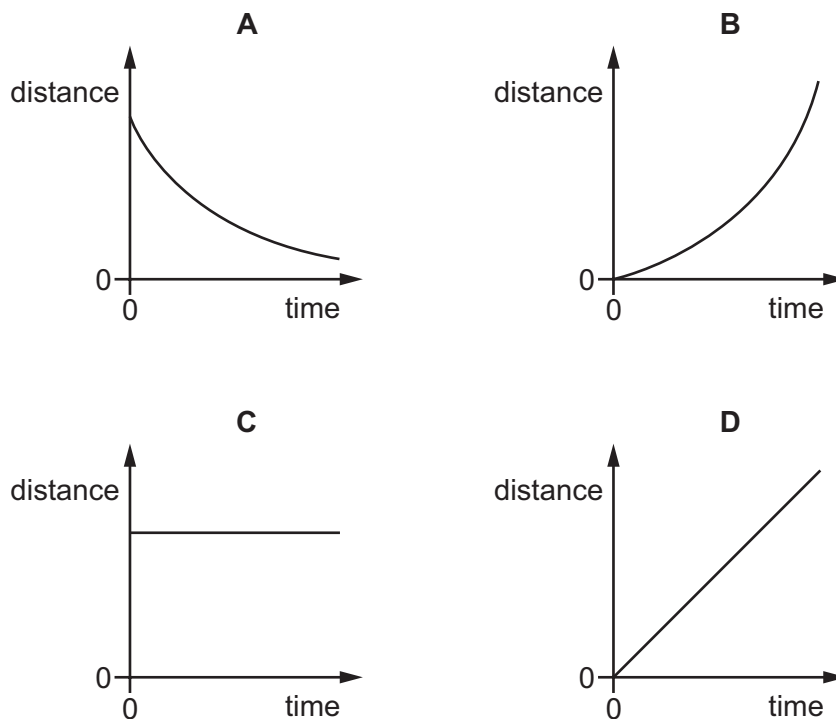
- A Its acceleration takes a longer time than its deceleration.
 - B It travels at constant speed for less than half of its journey time.
 - C It travels 2000 m in the first 100 s.
 - D It travels 10 000 m at constant speed.
- 22 A car travels 6.0 km along a main road in 6.0 minutes. It then travels 2.0 km along a minor road in 6.0 minutes.



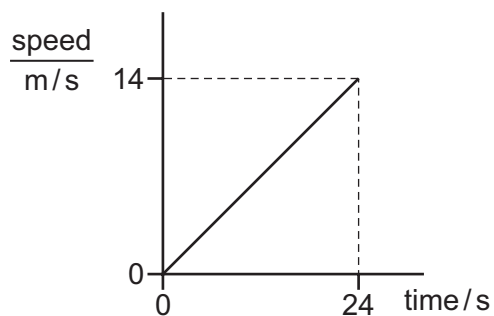
Which calculation of average speed for the whole journey is correct?

- A $8.0 \div 12.0 = 0.67 \text{ km/minute}$
- B $12.0 \div 8.0 = 1.5 \text{ km/minute}$
- C $8.0 + 12.0 = 20 \text{ km/minute}$
- D $8.0 \times 12.0 = 96 \text{ km/minute}$

23 Which distance/time graph represents the motion of an object moving at constant speed?



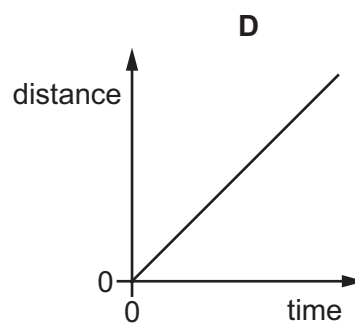
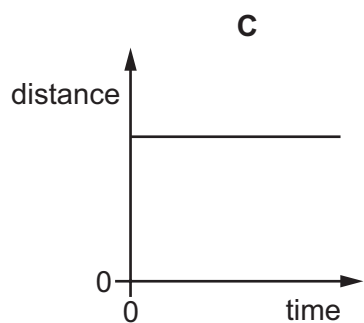
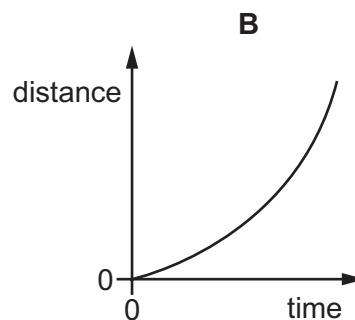
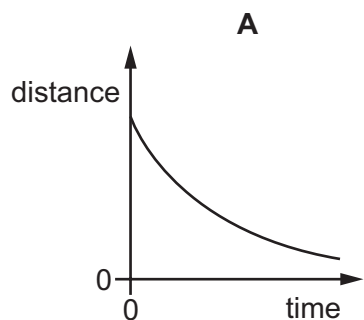
24 The graph shows how the speed of a car changes with time.



Which calculation gives the distance travelled by the car in 24 seconds?

- A $\left(\frac{14}{24}\right)\text{m}$
- B $\left(\frac{24}{14}\right)\text{m}$
- C $\left(\frac{24 \times 14}{2}\right)\text{m}$
- D $(24 \times 14)\text{m}$

25 Which distance/time graph represents the motion of an object moving at constant speed?

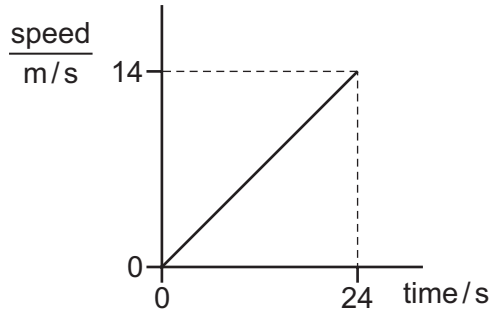


26 A car takes 15 minutes to travel along a road that is 20 km long.

What is the average speed of the car?

- A** 0.75 km/h **B** 5.0 km/h **C** 80 km/h **D** 300 km/h

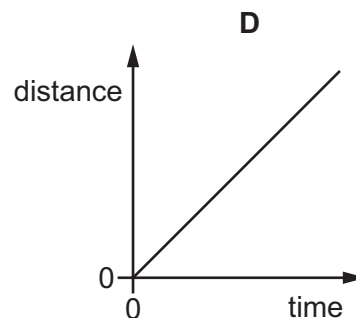
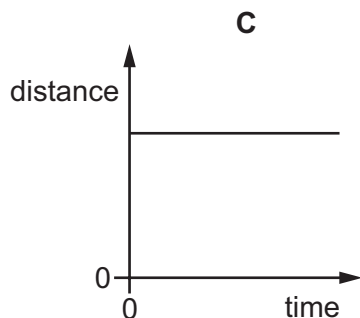
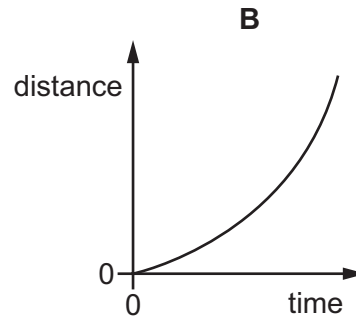
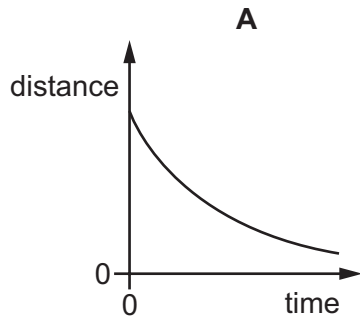
27 The graph shows how the speed of a car changes with time.



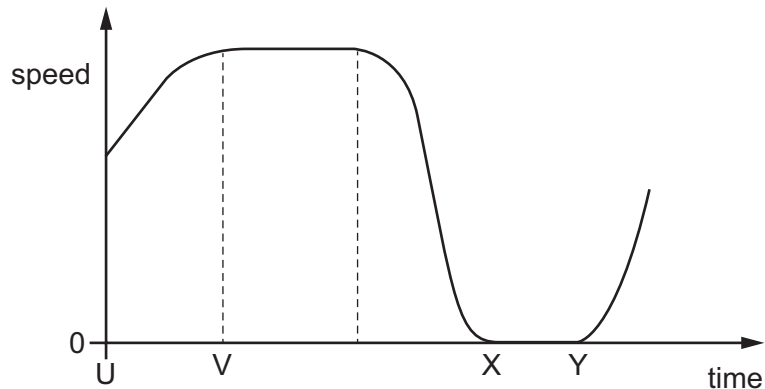
Which calculation gives the distance travelled by the car in 24 seconds?

- A $\left(\frac{14}{24}\right)\text{m}$
- B $\left(\frac{24}{14}\right)\text{m}$
- C $\left(\frac{24 \times 14}{2}\right)\text{m}$
- D $(24 \times 14)\text{m}$

28 Which distance/time graph represents the motion of an object moving at constant speed?



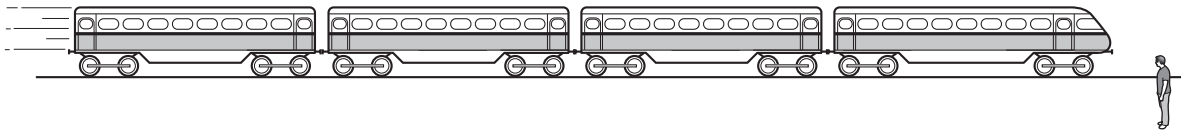
- 29 The graph shows how the speed of a car changes with time.



Between which two times is the car stationary?

- A** U and V **B** V and W **C** W and X **D** X and Y

- 30 A man stands by a railway track.

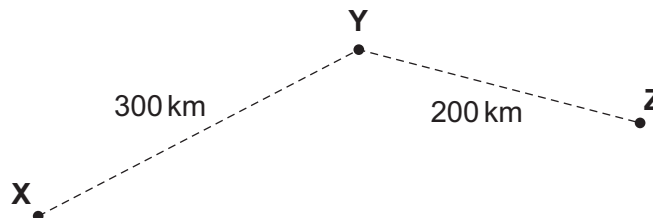


A train travelling at 40 m/s takes 2.0 s to pass the man.

What is the length of the train?

- A** 20 m **B** 38 m **C** 40 m **D** 80 m

- 31 An aeroplane flies from town **X** to town **Z**, stopping for 1 hour at town **Y** to pick up more passengers. The distances between the towns are shown in the diagram.

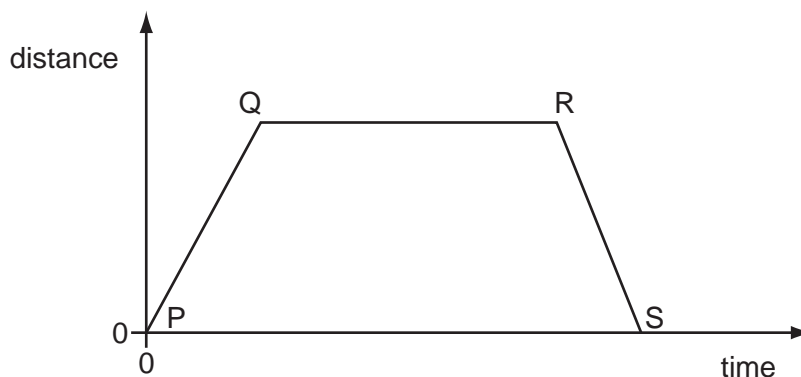


The total time taken between leaving **X** and arriving at **Z** is 3 hours.

What is the average speed of the aeroplane **in the air**?

- A** $\frac{500}{4}$ km/h **B** $\frac{500}{3}$ km/h **C** $\frac{500}{2}$ km/h **D** $\frac{500}{1}$ km/h

32 The graph shows how the distance travelled by a vehicle changes with time.



Which row describes the speed of the vehicle in each section of the graph?

	P to Q	Q to R	R to S
A	constant	zero	constant
B	constant	zero	decreasing
C	increasing	constant	decreasing
D	increasing	zero	decreasing

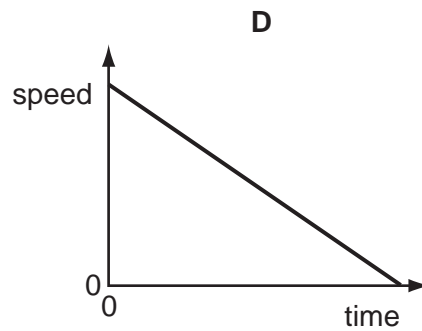
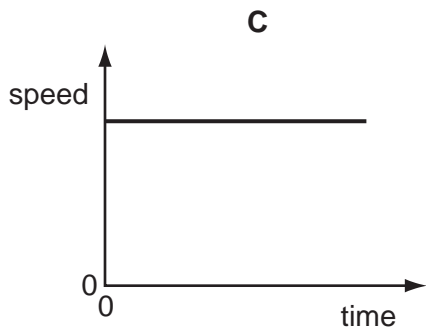
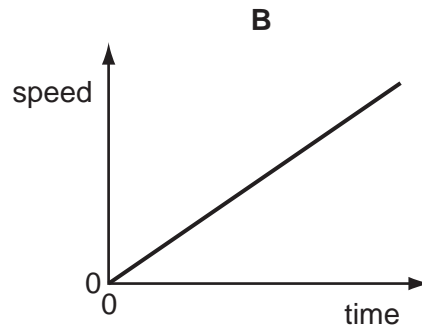
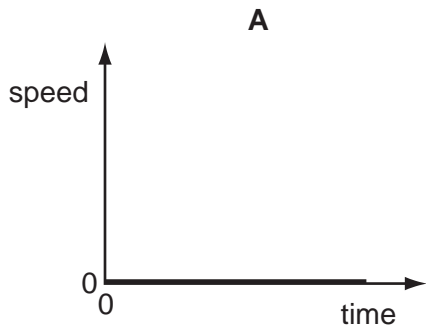
33 A small steel ball is dropped from a low balcony.

Ignoring air resistance, which statement describes its motion?

- A** It falls with constant acceleration.
- B** It falls with constant speed.
- C** It falls with decreasing speed.
- D** It falls with increasing acceleration.

34 A car is moving downhill along a road at a constant speed.

Which graph is the speed/time graph for the car?



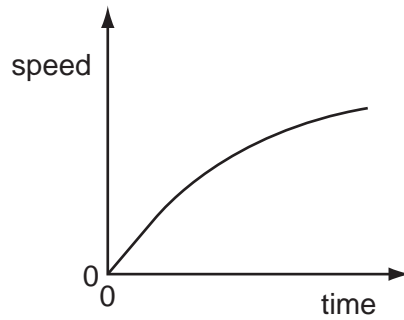
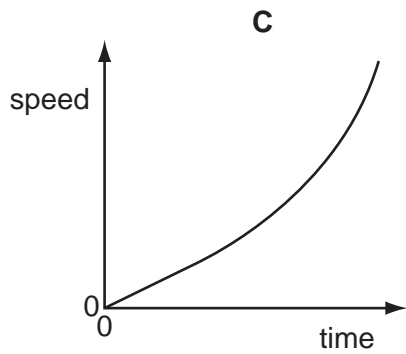
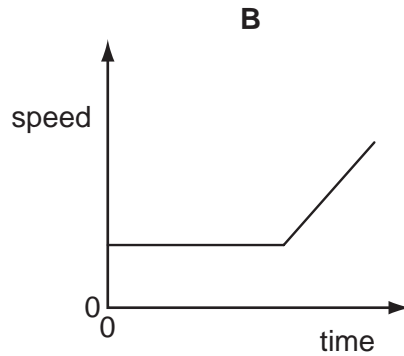
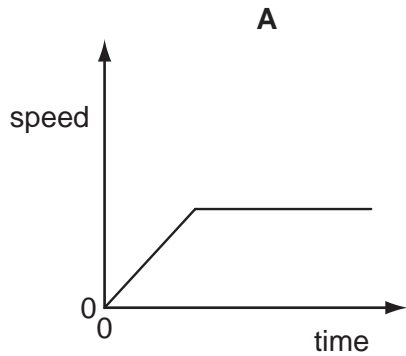
35 In a race, a car travels 60 times around a 3.6 km track. This takes 2.4 hours.

What is the average speed of the car?

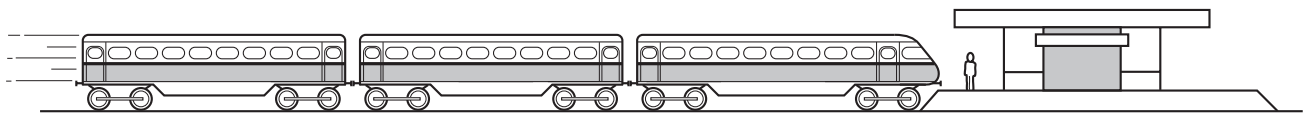
- A** 1.5 km/h **B** 90 km/h **C** 144 km/h **D** 216 km/h

36 An object moves initially with constant speed and then with constant acceleration.

Which graph shows this motion?



37 A child is standing on the platform of a station.



A train travelling at 30 m/s takes 3.0 s to pass the child.

What is the length of the train?

- A** 10 m **B** 27 m **C** 30 m **D** 90 m