Motion – 2019 June

1. 0625/11/M/J/19/No.2

A long-distance runner wishes to calculate her average speed for a race.

Which calculation should she use?

A $\text{average speed} = \dfrac{\text{total distance}}{\text{total time}}$

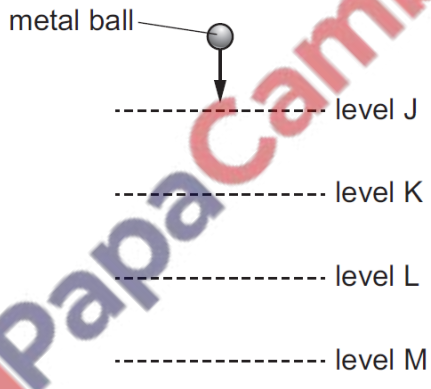
B average speed = total distance × total time

C $\text{average speed} = \dfrac{\text{total time}}{\text{total distance}}$

D average speed = total distance + total time

2. 0625/11$ 12$13/M/J/19/No.3

A heavy metal ball falls vertically downwards through air past four equally spaced levels J, K, L and M.



The times taken to fall from one level to the next are measured.

Where is the speed of the ball greatest and which time is shortest?

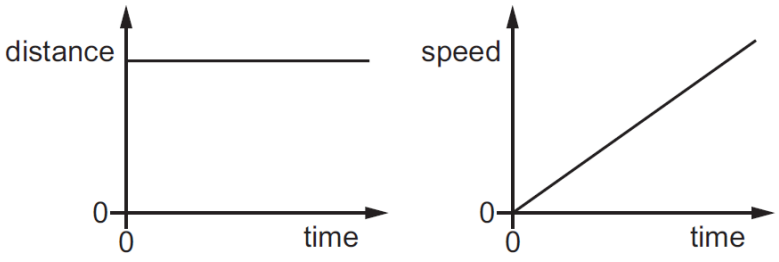
	speed is greatest between	time is shortest between
A	J and K	J and K
B	J and K	L and M
C	L and M	J and K
D	L and M	L and M

3. 0625/12/M/J/19/No.2

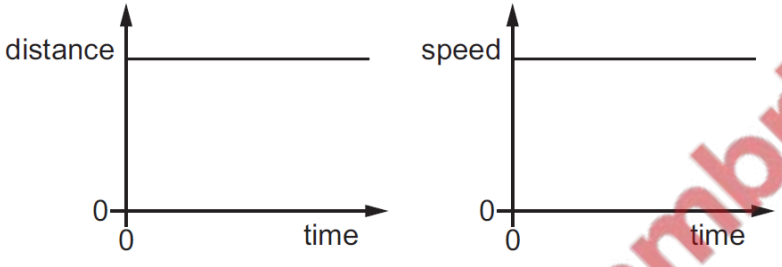
A car travels at constant speed.

Which pair of graphs show how the distance travelled by the car **and** how the car's speed vary with time?

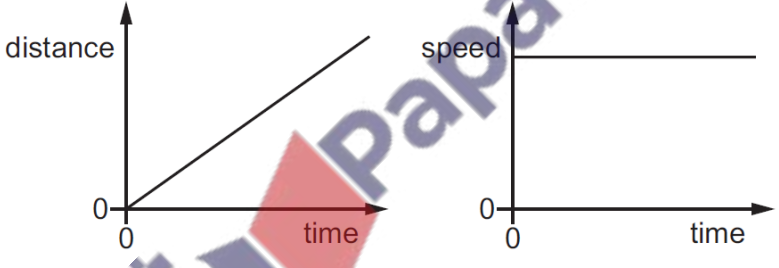
A



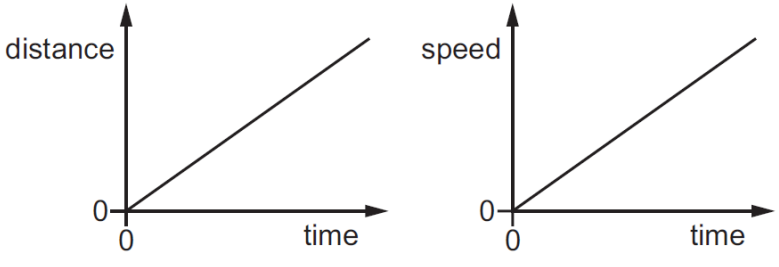
B



C

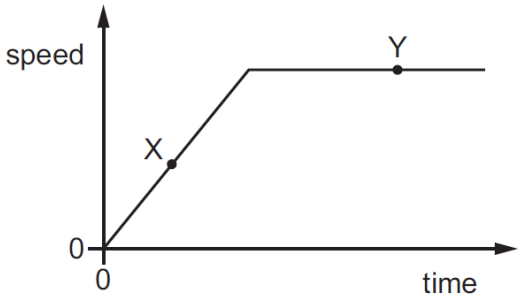


D



4. 0625/13/M/J/19/No.2

The diagram shows the speed-time graph for a car.



Which row describes the motion of the car at point X and at point Y?

	point X	point Y
A	at rest	moving with constant speed
B	moving with constant speed	at rest
C	moving with changing speed	at rest
D	moving with changing speed	moving with constant speed

5. 0625/21/M/J/19/No.2

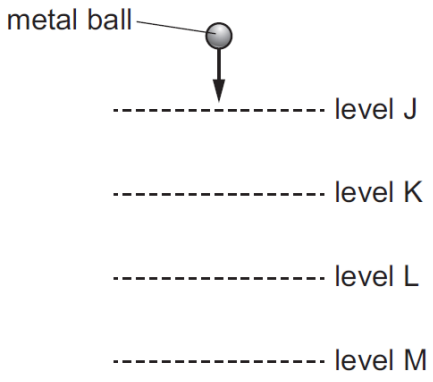
The velocity of an object increases from 30 m / s to 50 m / s in 5.0 seconds.

What is the average acceleration of the object?

A $0.10\,m/s^2$ **B** $0.25\,m/s^2$ **C** $4.0\,m/s^2$ **D** $10\,m/s^2$

6. 0625/21,22,23/M/J/19/No.3

A heavy metal ball falls vertically downwards through air past four equally spaced levels J, K, L and M.



The times taken to fall from one level to the next are measured.

Where is the speed of the ball greatest and which time is shortest?

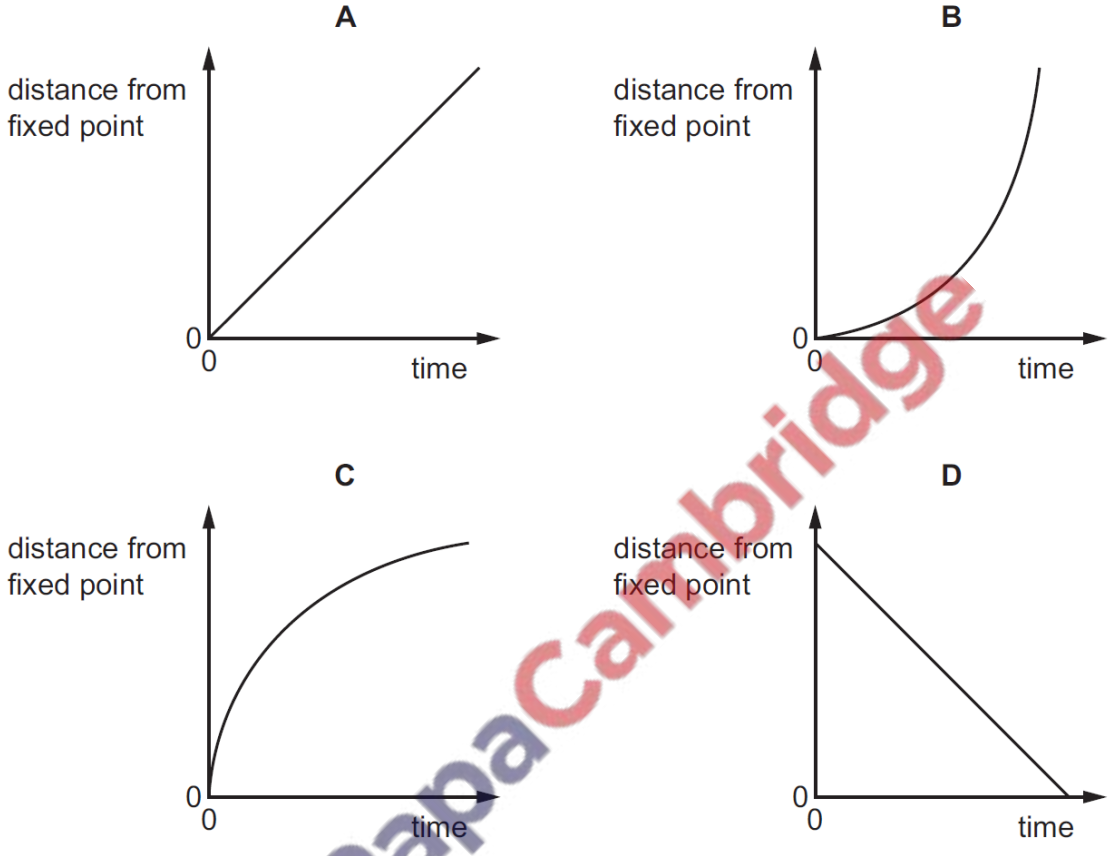
	speed is greatest between	time is shortest between
A	J and K	J and K
B	J and K	L and M
C	L and M	J and K
D	L and M	L and M

7. 0625/22/M/J/19/No.2

Four objects are moving along a straight line.

The distance of an object from a fixed point on the line is plotted against time for each object.

Which object is decelerating?



8. 0625/23/M/J/19/No.2

A brass ball and a feather are released at the same time.

On Earth, the ball reaches the ground first.

On the Moon, they reach the ground at the same time.

What is the explanation for this?

A Both weigh the same on the Moon.

B Both weigh less on the Moon.

C There is a greater air resistance on the Moon.

D There is no air resistance on the Moon.

9. 0625/12/F/M/19/No.2

An object is moving with uniform deceleration.

Which statement describes its motion?

A Its rate of change of speed is decreasing.

B Its speed is constant.

C Its speed is decreasing.

D Its speed is increasing.

10. 0625/12/F/M/19/No.3

A ball rolls down a ramp. The time it takes to move from X to Y is measured.

Which other quantity must be measured in order to calculate the average speed of the ball between point X and point Y?

A angle of slope

B diameter of ball

C distance between X and Y

D height of ramp

11. 0625/22/F/M/19/No.2

An object is moving with uniform deceleration.

Which statement describes its motion?

A Its rate of change of speed is decreasing.

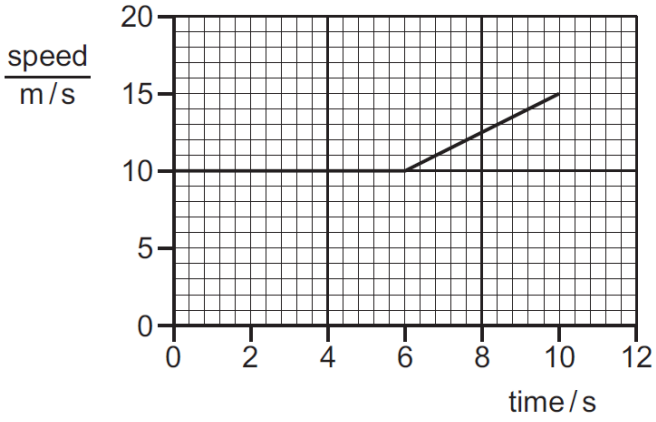
B Its speed is constant.

C Its speed is decreasing.

D Its speed is increasing.

12. 0625/22/F/M/19/No.3

The graph shows how the speed of a car varies during part of its journey.



What is the value of the car's acceleration between 6 s and 10 s?

A $0.50\,m/s^2$ **B** $0.80\,m/s^2$ **C** $1.25\,m/s^2$ **D** $1.50\,m/s^2$