

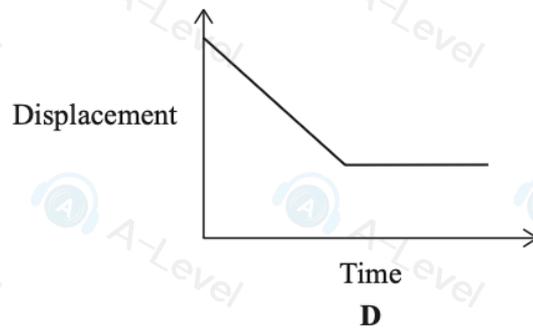
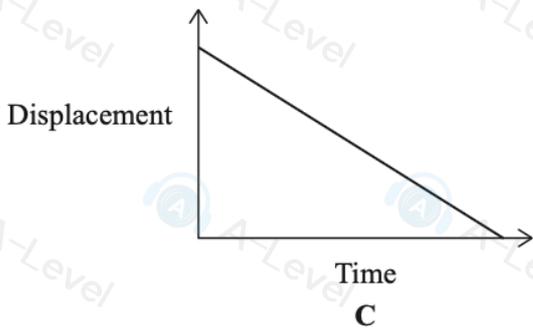
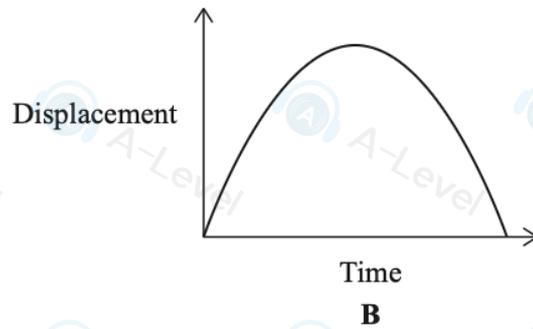
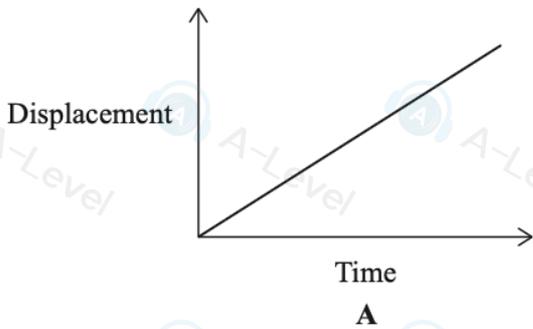
1 Which of the following quantities has the SI base units $\text{kg m}^2 \text{s}^{-3}$?

- A force
- B momentum
- C power
- D work done

(Total for Question 1 = 1 mark)

6: An object has a constant non-zero acceleration.

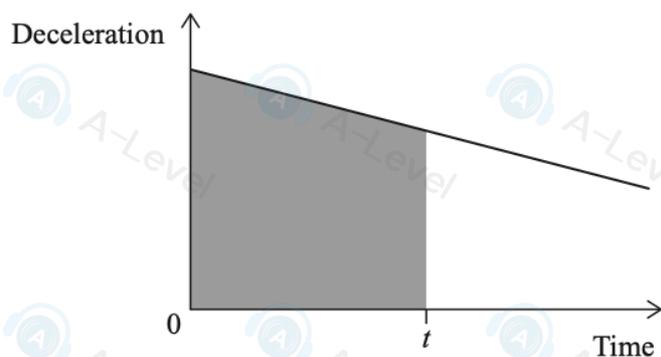
Which of the following displacement-time graphs could represent the motion of the object?



- A
- B
- C
- D

(Total for Question 6 = 1 mark)

- 5 An aeroplane lands on a runway at time 0 and then decelerates. The graph shows how the deceleration of the aeroplane varies with time.



Which of the following does the shaded area on the graph represent?

- A The displacement of the aeroplane at time t .
- B The change in displacement of the aeroplane during time t .
- C The velocity of the aeroplane at time t .
- D The change in velocity of the aeroplane during time t .

(Total for Question 5 = 1 mark)

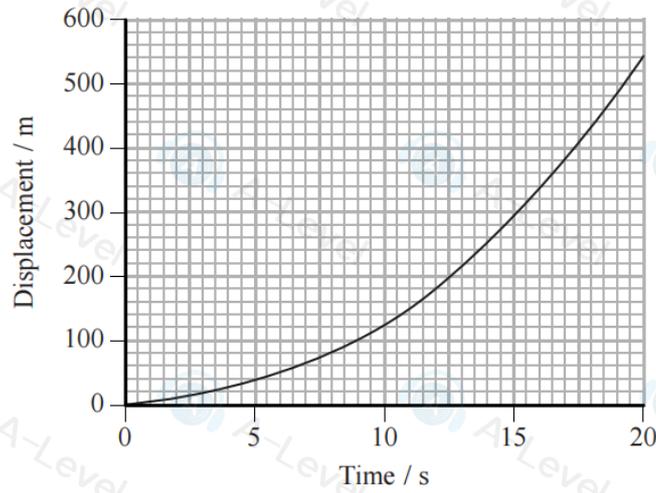
- 9 A person stands on some bathroom scales in a stationary lift. The lift begins to move upwards with a constant acceleration.

The reading on the scales will

- A increase but then remain constant.
- B increase at a constant rate.
- C decrease but then remain constant.
- D decrease at a constant rate.

(Total for Question 9 = 1 mark)

15 The graph shows how the displacement of a racing car along a straight track varies with time.



(a) A student used the graph to calculate the velocity of the car at 15 s.

The student wrote:

$$\begin{aligned}\text{Velocity} &= \text{displacement} / \text{time} \\ &= 300/15 \\ &= 20\text{m s}^{-1}\end{aligned}$$

State why this value is incorrect and calculate the correct velocity at 15 s.

(3)

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Velocity of the car at 15 s =

(b) The gradient of the graph continued to increase as the car travelled along the track. After 20 s the rate of increase of the gradient began to decrease.

Explain why the rate of increase of the gradient decreased.

(2)

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(Total for Question 15 = 5 marks)

(b) At the instant shown, car A is 100 m from the finish line.

Deduce whether car A reaches the finish line before car B.

(3)

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(Total for Question 13 = 6 marks)