A Level · OCR · Physics

12 mins 12 questions

Multiple Choice Questions

Kinematics

Displacement, Velocity & Acceleration / Motion Graphs / Displacement & Velocity-Time Graphs

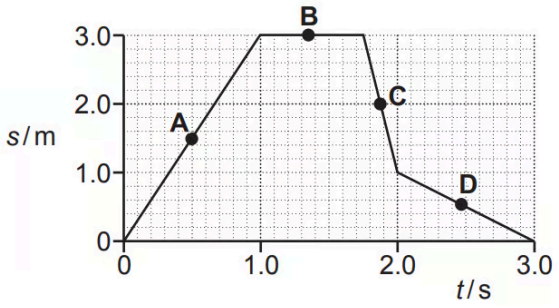
Easy (2 questions)	/2
Medium (5 questions)	/5
Hard (5 questions)	/5
Total Marks	**/12**

Scan here to return to the course
or visit savemyexams.com

Easy Questions

1 An object is moving in a straight line.

The displacement *s* against time *t* graph for this object is shown below.

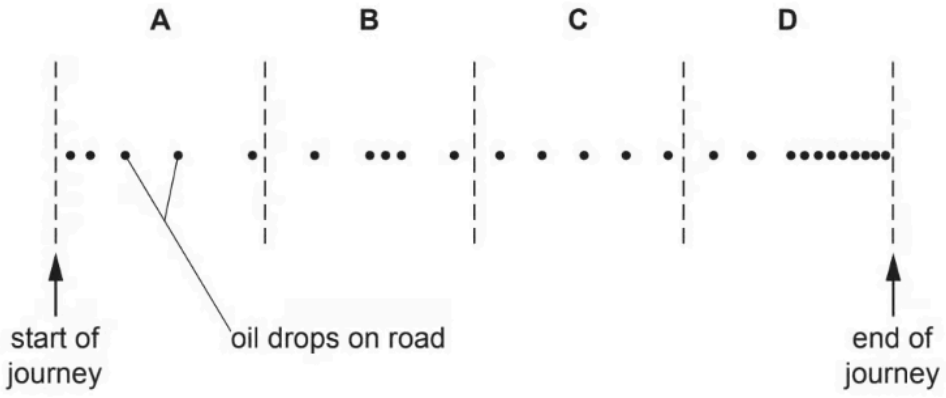


At which point **A**, **B**, **C** or **D**, does the object have the **greatest** speed?

(1 mark)

2 A car is dripping oil at a steady rate on a straight road.

The road is divided into four sections **A, B, C,** and **D**.

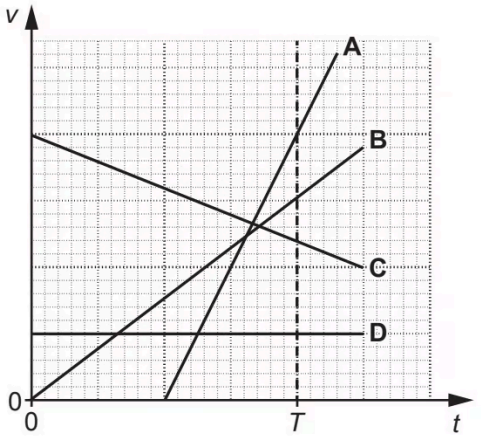


Which section of the road shows the car travelling at a constant speed?

(1 mark)

Medium Questions

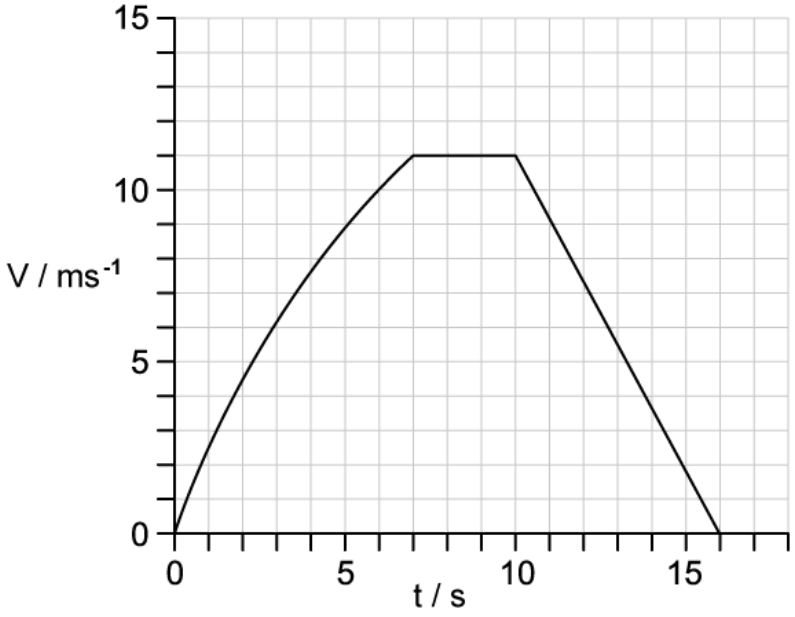
1 The velocity v against time t graphs for four objects **A**, **B**, **C** and **D** are shown below.



Which object travels the greatest distance between $t = 0$ and $t = T$?

(1 mark)

2 The velocity-time graph of a car traveling in a straight line is shown below.



Which of the following is the best estimate for the distance travelled by the car?

A. 70 m

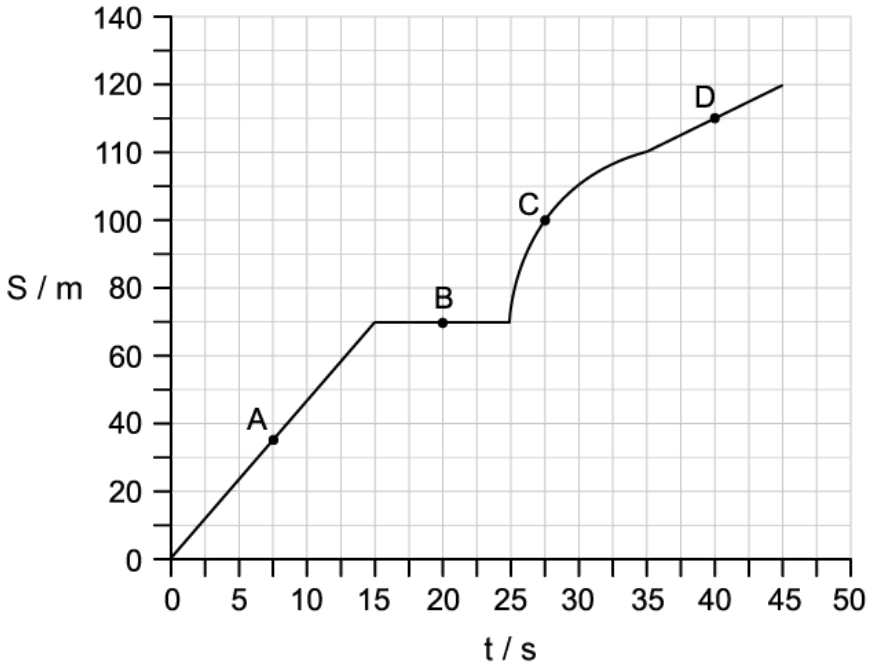
B. 100 m

C. 110 m

D. 140 m

(1 mark)

3 The distance-time graph of a cyclist's journey is shown below.



Which of the following statements are true?

1. The velocity of the cyclist at point **A** is 4.67 m s^{-1}
2. The velocity of the cyclist at point **B** is 3.75 m s^{-1}
3. The cyclist has constant velocity at point **C**
4. The cyclist has constant acceleration at point **D**

A. 1, 3 and 4

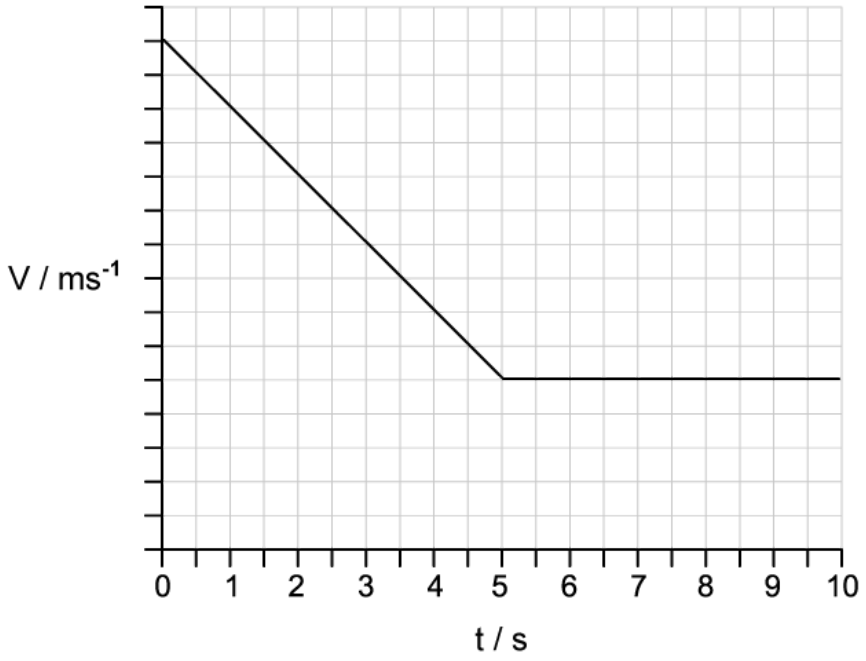
B. Only 1 and 2

C. Only 1 and 4

D. Only 1

(1 mark)

4 The graph below shows the motion of an object.



Between t = 0 s and t = 5 s, the acceleration is – 3 m s^{-2}.

By determining the scale of the y-axis, what is the velocity of the object at t = 8 s?

A. 0.3 m s^{-1}

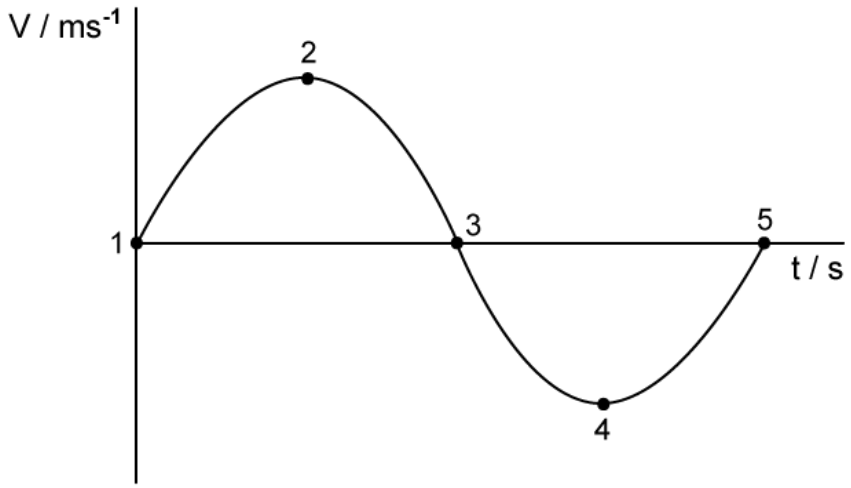
B. 7.5 m s^{-1}

C. 15 m s^{-1}

D. 1.5 m s^{-1}

(1 mark)

5 The graph below shows the velocity-time graph of a simple pendulum.



Which points on the graph lie at the point of greatest acceleration?

A. 2 and 4

B. Only 3

C. 1, 3 and 5

D. 2 and 3

(1 mark)

Hard Questions

1 An object is travelling backwards in a straight line, with a constant speed of 2 m s^{-1}. At t = 0 s, the displacement of the object is 3 m.

By taking forward motion as positive, which statement best describes the displacement-time graph of the object?

A. A straight line with a gradient of 2 which intercepts the *x*-axis at 3 s

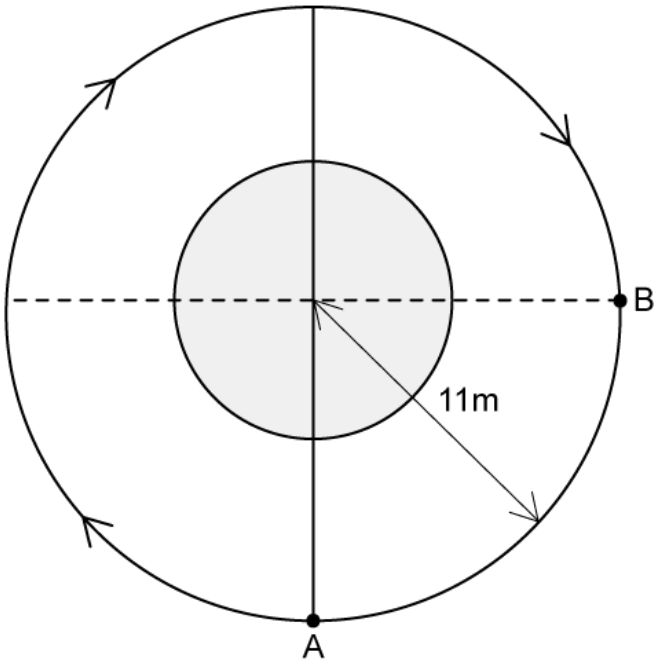
B. A curved line which intercepts the *y*-axis at 3 m

C. A straight line with a gradient of - 2 which intercepts the *x*-axis at 1.5 s

D. A straight line with a gradient of - 2 which intercepts the origin

(1 mark)

2 The diagram below shows a particle traveling clockwise in a circular path from point **A** to point **B**. The time taken is 6.5 s. The radius of the circle is 11 m.



What is the average speed of the particle?

A. 10.6 m s^{-1}

B. 71.5 m s^{-1}

C. 1.69 m s^{-1}

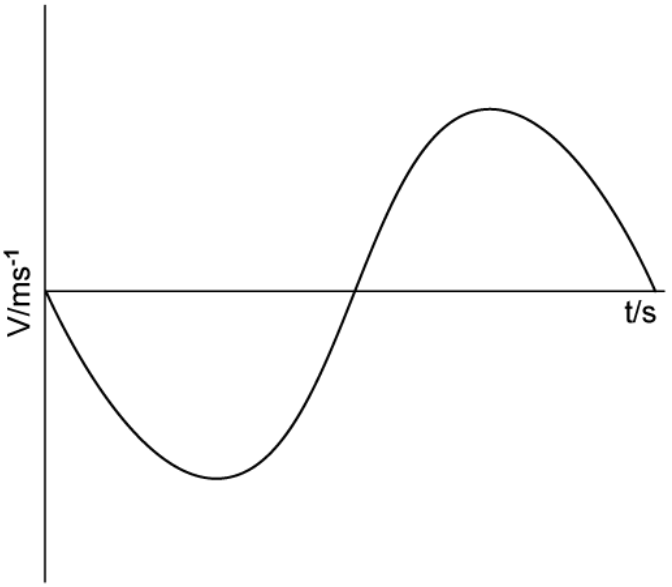
D. 7.97 m s^{-1}

(1 mark)

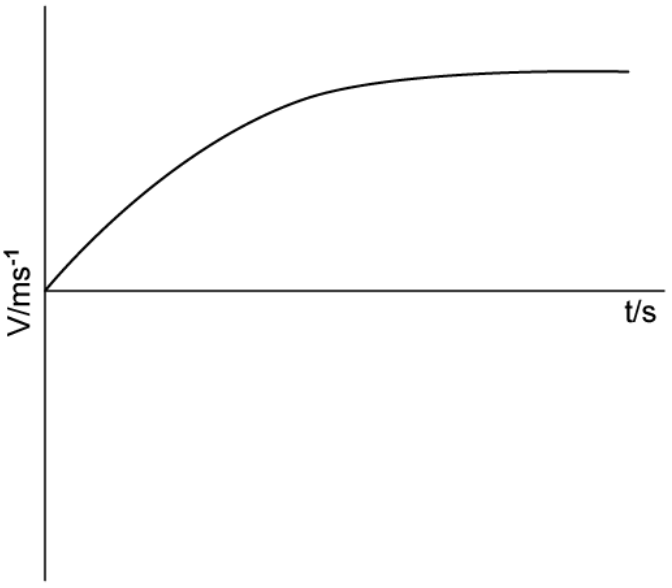
3 A child on a swing is released from rest, *x* cm away from its equilibrium position.

Which graph describes the velocity of the swing?

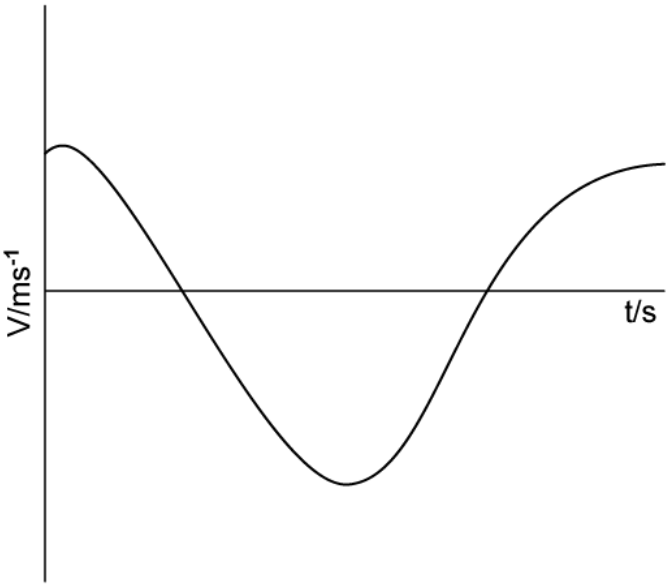
A.



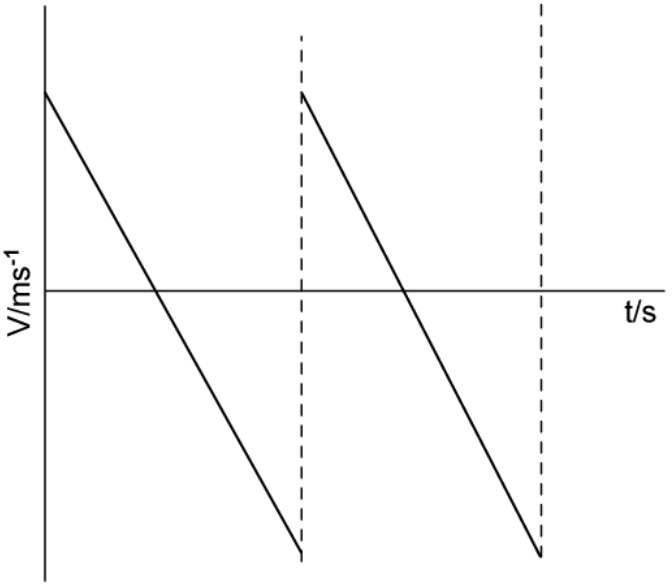
B.



C.



D.



(1 mark)

4 A particle has a constant acceleration of - 4.4 m s^{-2}. At t = 0, the velocity u of this particle is 15 m s^{-1}.

What is the value of t when the velocity has halved?

A. 3.4 s

B. 1.7 s

C. 0.29 s

D. 0.59 s

(1 mark)

5 Car **X** and Car **Y** have velocities of v_X and v_Y respectively. Car **X** takes three quarters of the time that Car **Y** takes to reach distance s.

What is the value of the ratio $\frac{v_X}{v_Y}$?

A. $\frac{4}{3}$

B. $\frac{3}{4}$

C. $\frac{2}{3}$

D. $\frac{1}{4}$

(1 mark)