



Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

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I declare this is my own work.

AS MATHEMATICS

Paper 1

7356/1

Time allowed: 1 hour 30 minutes

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]



- You must have the AQA Formulae for A-level Mathematics booklet.
- You should have a graphical or scientific calculator that meets the requirements of the specification.

INSTRUCTIONS

- Use black ink or black ball-point pen. Pencil should only be used for drawing.
- Answer ALL questions.
- You must answer each question in the space provided for that question. If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do NOT write on blank pages.
- Show all necessary working; otherwise marks for method may be lost.
- Do all rough work in this book. Cross through any work that you do not want to be marked.



INFORMATION

- **The marks for questions are shown in brackets.**
- **The maximum mark for this paper is 80.**

ADVICE

- **Unless stated otherwise, you may quote formulae, without proof, from the booklet.**
- **You do not necessarily need to use all the space provided.**

DO NOT TURN OVER UNTIL TOLD TO DO SO



SECTION A

Answer ALL questions in the spaces provided.

1 Express as a single logarithm

$$\log_{10} 2 - \log_{10} x$$

Circle your answer. [1 mark]

$$\log_{10} (2 + x)$$

$$\log_{10} (2 - x)$$

$$\log_{10} (2x)$$

$$\log_{10} \left(\frac{2}{x} \right)$$



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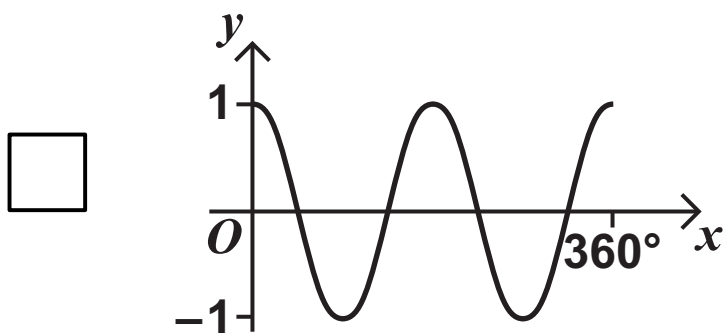
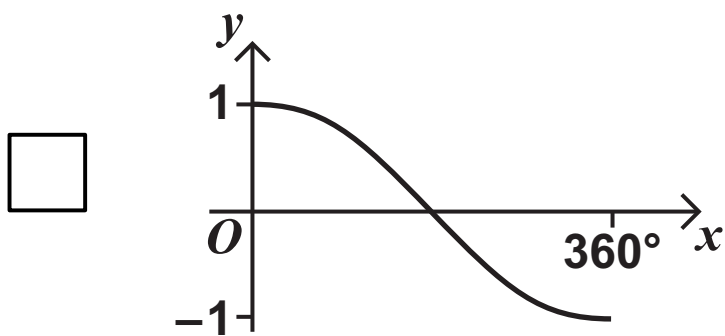
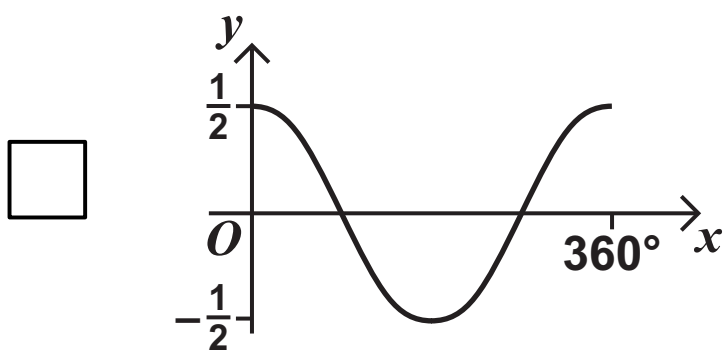
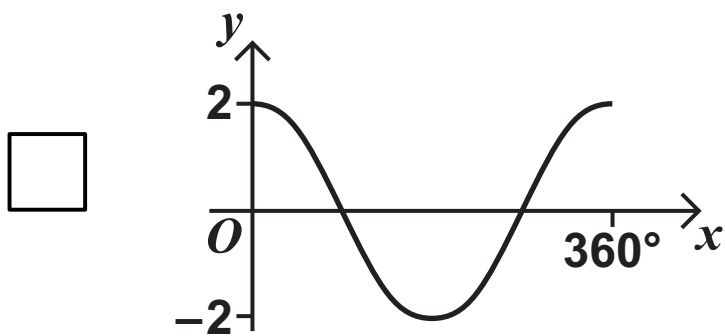


2 The graph of the function $y = \cos \frac{1}{2}x$ for $0^\circ \leq x \leq 360^\circ$ is one of the graphs shown opposite.

Identify the correct graph.



Tick (✓) ONE box. [1 mark]



[Turn over]



6 ***AB* is a diameter of a circle where *A* is (1, 4) and *B* is (7, -2)**

6 (a) **Find the coordinates of the midpoint of *AB*.**
[1 mark]

6 (b) **Show that the equation of the circle may be written as**

$$x^2 + y^2 - 8x - 2y = 1$$

[4 marks]



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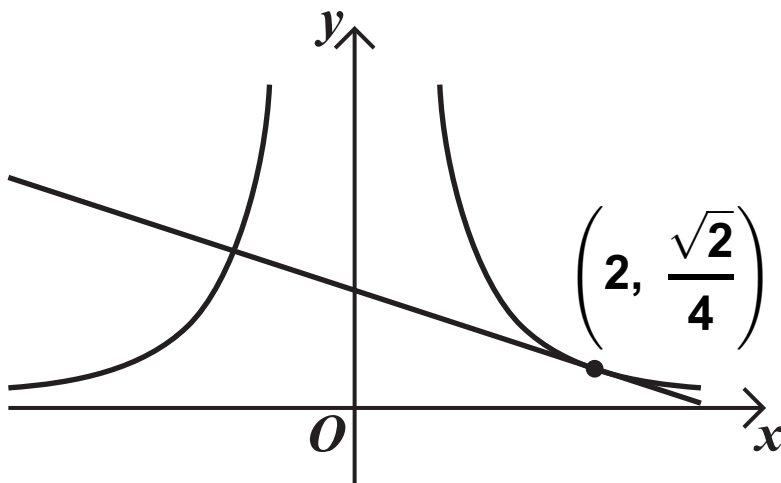
8 (d) Write down the equation of a line which is a tangent to the curve in two places. [1 mark]

[Turn over]

[Turn over]



- 10 (b) Show that the tangent to C at the point $\left(2, \frac{\sqrt{2}}{4}\right)$ is also a normal to the curve at a different point.



[5 marks]

[Turn over]



SECTION B

Answer ALL questions in the spaces provided.

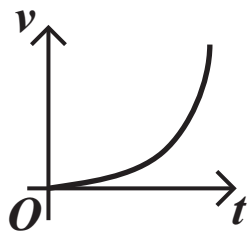
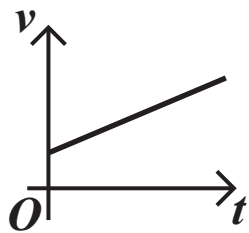
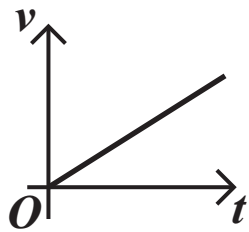
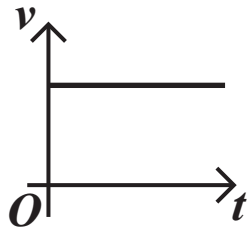
- 11 **A car, initially at rest, moves with constant acceleration along a straight horizontal road.**

One of the graphs opposite shows how the car's velocity, $v \text{ m s}^{-1}$, changes over time, t seconds.

Identify the correct graph.



Tick (✓) ONE box. [1 mark]



[Turn over]



12

A horizontal force of 30 N causes a crate to travel with an acceleration of 2 m s^{-2} , in a straight line, on a smooth horizontal surface.

Find the **WEIGHT** of the crate.

Circle your answer. [1 mark]

15 kg

15g N

15 N

15g kg



16 Jermaine and his friend Meena are walking in the same direction along a straight path.

Meena is walking at a constant speed of $u \text{ m s}^{-1}$

Jermaine is walking 0.2 m s^{-1} more slowly than Meena.

When Jermaine is d metres behind Meena he starts to run with a constant acceleration of 2 m s^{-2} , for a time of t seconds, until he reaches her.

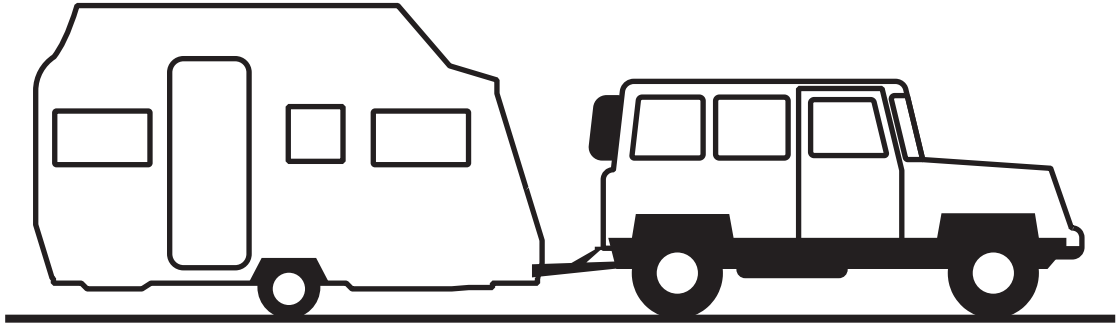
16 (a) Show that

$$d = t^2 - 0.2t$$

[4 marks]



17



A car and caravan, connected by a tow bar, move forward together along a horizontal road.

Their velocity $v \text{ m s}^{-1}$ at time t seconds, for $0 \leq t < 20$, is given by

$$v = 0.5t + 0.01t^2$$

- 17 (a) Show that when $t = 15$ their acceleration is 0.8 m s^{-2} [2 marks]

17 (b) The car has a mass of 1500 kg

The caravan has a mass of 850 kg

When $t = 15$ the tension in the tow bar is 800 N and the car experiences a resistance force of 100 N

17 (b) (i) Find the total resistance force experienced by the caravan when $t = 15$ [2 marks]

[Turn over]



17 (c) State one assumption you have made about the tow bar. [1 mark]

END OF QUESTIONS

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