Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0123456789

ADDITIONAL MATHEMATICS **0606/01**

Paper 1 Non-calculator **For examination from 2025**

SPECIMEN PAPER B **2 hours**

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- Calculators must **not** be used in this paper.
- You must show all necessary working clearly.

INFORMATION

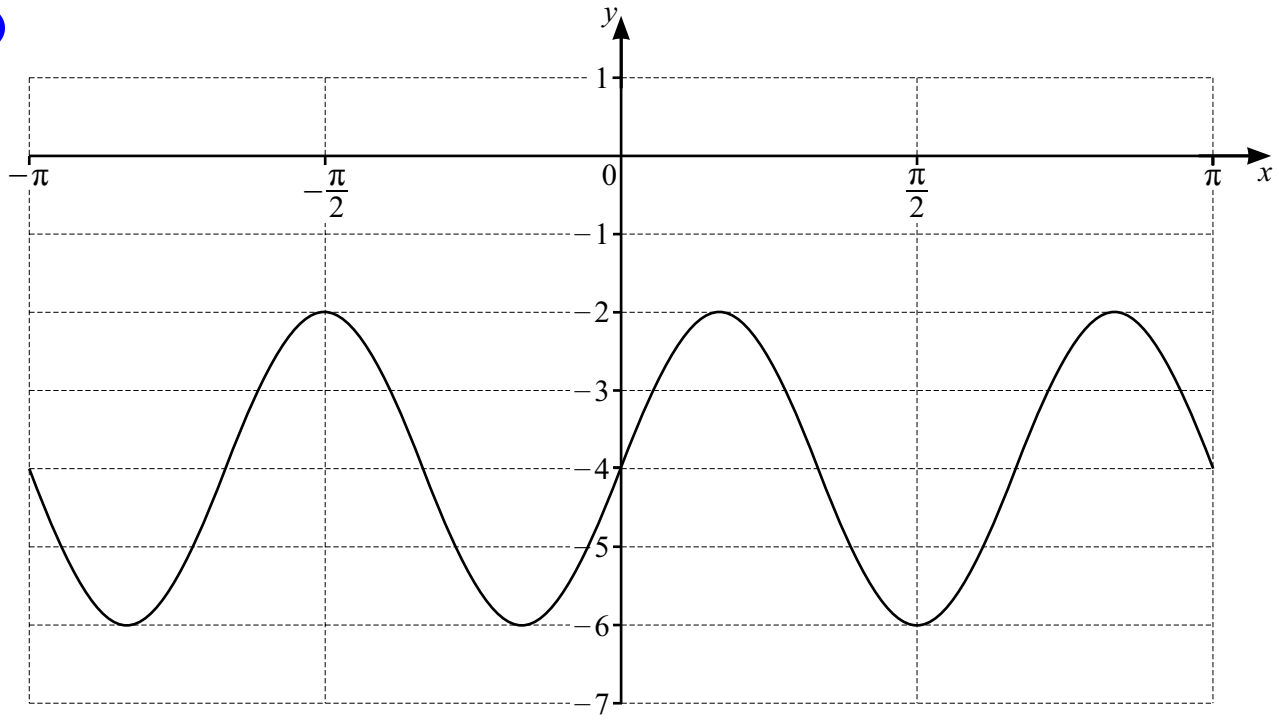
- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

[Turn over

Calculators must **not** be used on this paper.

1



The diagram shows the graph of $y = a\sin bx + c$, where a, b and c are integers.

Find the values of a, b and c. [3]

2 The solutions of the equation $|5x + 2| = |3x - 4|$ are $x = a$ and $x = b$ where $a > b$.

Find the value of $|2a - 3| - |b - 1|$. [5]

3 Find the values of k such that the line $y = 9kx + 1$ does not meet the curve $y = kx^2 + 3x(2k + 1) + 4$. [5]

4 It is given that $\cot\theta = -2\sqrt{6}$ for $\pi < \theta < 2\pi$.

(a) Find the value of $\sin\theta$. [3]

(b) Find the value of $\cos\theta$, giving your answer in surd form. [2]

5 Solve the following simultaneous equations.

$$3y - 2x + 2 = 0$$
$$xy = \frac{1}{2}$$

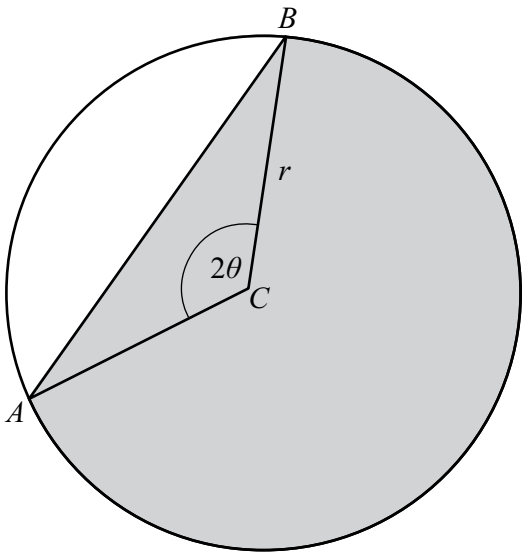
[3]

6 Points P, Q and R have coordinates $P\,(-4, -8)$, $Q\,(2, 4)$ and $R\,(10, 0)$.

(a) Show that the line PQ is perpendicular to the line QR. [2]

(b) Hence find the equation of the circle which passes through P, Q and R. [5]

7 In this question, all lengths are in centimetres and all angles are in radians.



The diagram shows the circle with centre C and radius r.
The points A and B lie on the circumference of the circle such that angle ACB is 2θ radians, where $\theta < \frac{\pi}{2}$.

(a) Find, in terms of r and θ, the perimeter of the shaded region. [3]

(b) Find, in terms of r and θ, the area of the shaded region. [3]

8

$$\sin\frac{\pi}{3}=\frac{\sqrt{3}}{2} \qquad \cos\frac{\pi}{3}=\frac{1}{2} \qquad \tan\frac{\pi}{3}=\sqrt{3}$$

It is given that $y=\tan x\sin 3x$.

(a) Find the exact value of $\frac{\mathrm{d}y}{\mathrm{d}x}$ when $x=\frac{\pi}{3}$. [4]

(b) It is given that x is increasing at the rate of 3 units per second.

Find the corresponding rate of change in y when $x=\frac{\pi}{3}$.
Give your answer in its simplest surd form. [2]

(c) Find the approximate change in y as x increases from $\frac{\pi}{3}$ to $\frac{\pi}{3}+h$ where h is small. [1]

9 **(a)** Show that $\frac{1}{2x+1}-\frac{1}{(2x+1)^2}+\frac{4}{4x-1}=\frac{24x^2+14x+4}{(2x+1)^2(4x-1)}$. [2]

(b) Hence find $\int_{\frac{1}{2}}^{1}\frac{24x^2+14x+4}{(2x+1)^2(4x-1)}\mathrm{d}x$.

Give your answer in the form $\frac{1}{2}\ln p+q$ where p and q are rational numbers. [7]

10 A particle P is initially at the point with position vector $\begin{pmatrix}30\\10\end{pmatrix}$ and moves with a constant speed of $10\,\text{ms}^{-1}$ in the same direction as $\begin{pmatrix}-4\\3\end{pmatrix}$.

(a) Find the position vector of P at time t seconds. [3]

As P starts moving, a particle Q starts to move such that its position vector at time t seconds is given by $\begin{pmatrix}-80\\-90\end{pmatrix}+t\begin{pmatrix}5\\12\end{pmatrix}$.

(b) Find the speed of Q. [1]

(c) Find the distance between P and Q when $t = 10$.

Give your answer in its simplest surd form. [3]

11 Given that $40 \times {}^{n}C_{5} = 2(n-1) \times {}^{n+1}C_{6}$, find the value of n. [3]

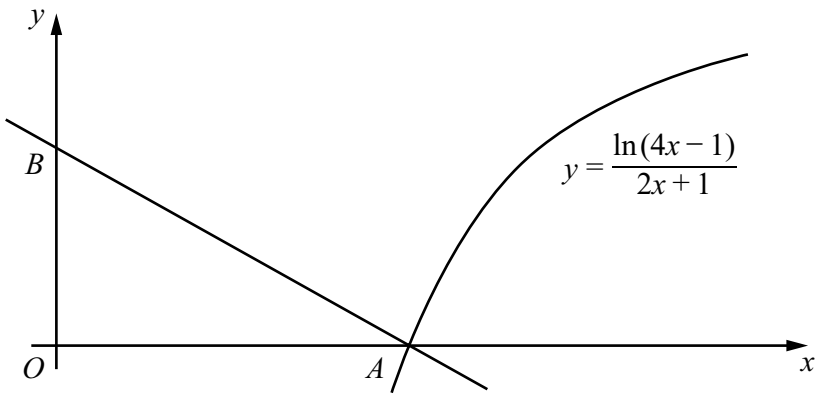
12 Solve the equation $3 + \log_3 x = 10 \log_x 3$, giving your answers as powers of 3. [4]

13 A curve is such that $\frac{d^2y}{dx^2} = 6e^{3x} + 4x$.

The curve has a gradient of 5 at the point $\left(0, \frac{5}{3}\right)$.

Find the equation of the curve. [7]

14



The diagram shows part of the curve $y = \frac{\ln(4x-1)}{2x+1}$ and the normal to the curve at the point A.
The curve crosses the x-axis at A.
The normal to the curve at A meets the y-axis at the point B.

Find the equation of this normal and hence the coordinates of B. [9]

