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Cambridge International Education

Cambridge IGCSE™

CANDIDATE NAME	

CENTRE NUMBER		CANDIDATE NUMBER	

* 1 9 3 2 2 7 1 6 9 2 *

ADDITIONAL MATHEMATICS **0606/23**

Paper 2 **May/June 2026**

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. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You should use a scientific calculator where appropriate.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

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.

DC (CJ/SW) 360563/4

List of formulas

Equation of a circle with centre (a, b) and radius r. $(x-a)^2 + (y-b)^2 = r^2$

Curved surface area, A, of cone of radius r, sloping edge l. $A = \pi r l$

Surface area, A, of sphere of radius r. $A = 4\pi r^2$

Volume, V, of pyramid or cone, base area A, height h. $V = \frac{1}{3}Ah$

Volume, V, of sphere of radius r. $V = \frac{4}{3}\pi r^3$

Quadratic equation

For the equation $ax^2 + bx + c = 0$,

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Binomial theorem

$$(a+b)^n = a^n + \binom{n}{1}a^{n-1}b + \binom{n}{2}a^{n-2}b^2 + \ldots + \binom{n}{r}a^{n-r}b^r + \ldots + b^n,$$

where n is a positive integer and $\binom{n}{r} = \frac{n!}{(n-r)!r!}$

Arithmetic series

$$u_n = a + (n-1)d$$
$$S_n = \frac{1}{2}n(a + l) = \frac{1}{2}n\{2a + (n-1)d\}$$

Geometric series

$$u_n = ar^{n-1}$$
$$S_n = \frac{a(1-r^n)}{1-r} \quad (r \neq 1)$$
$$S_\infty = \frac{a}{1-r} \quad (|r| < 1)$$

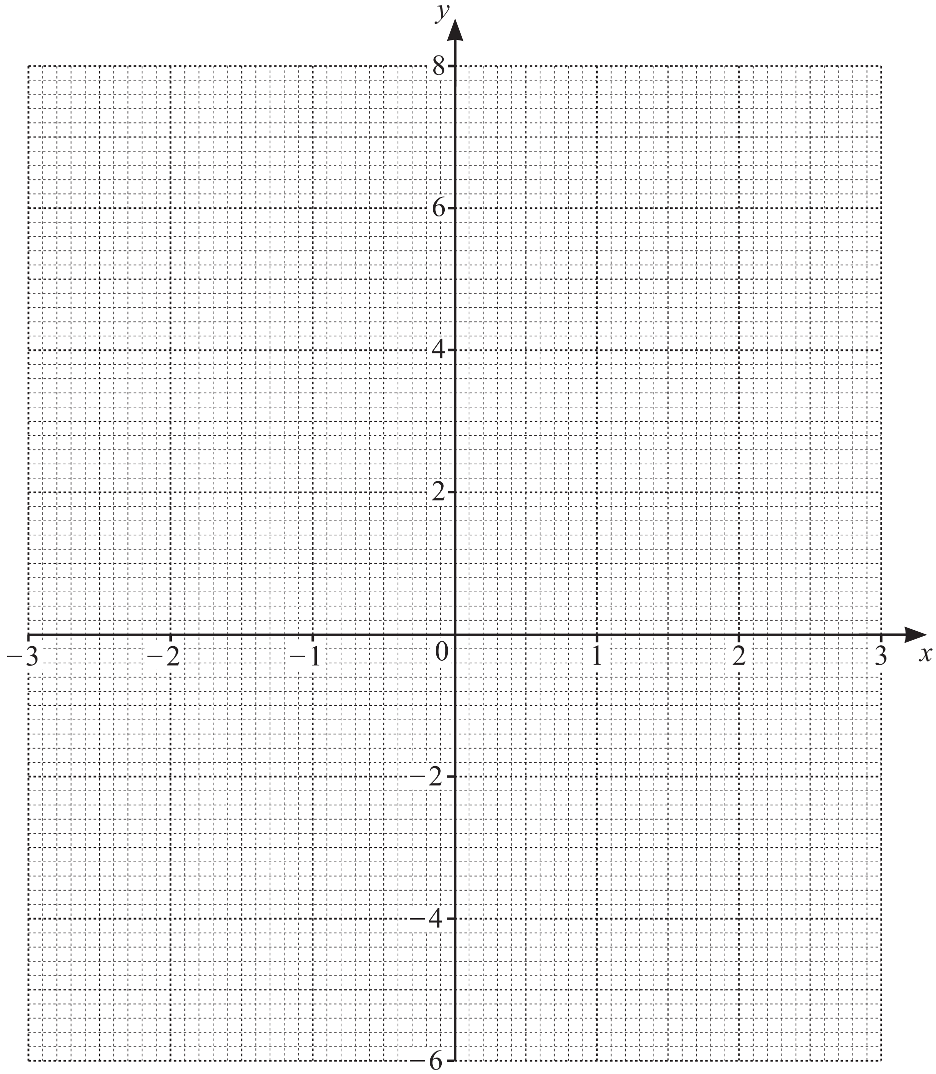
Identities

$$\sin^2 A + \cos^2 A = 1$$
$$\sec^2 A = 1 + \tan^2 A$$
$$\operatorname{cosec}^2 A = 1 + \cot^2 A$$

Formulas for ΔABC

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$
$$a^2 = b^2 + c^2 - 2bc\cos A$$
$$\Delta = \frac{1}{2}ab\sin C$$

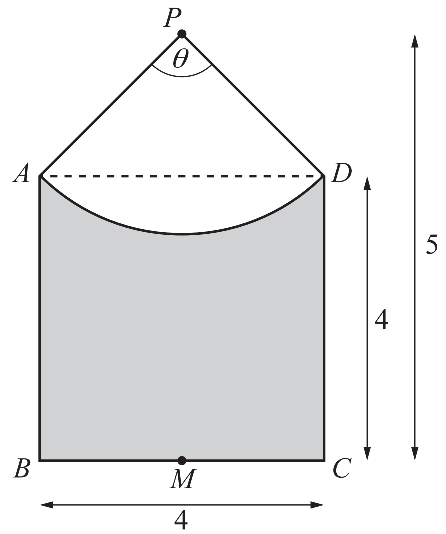
1



(a) On the grid, draw the graph of $y = |2x+1|$ for $-3 \leqslant x \leqslant 3$. [2]

(b) By drawing a suitable graph on the grid, solve the inequality $|2x+1| > x+2$. [3]

2 In this question lengths are in centimetres.



The diagram shows a shape $ABCDP$.
AB, BC and CD are three sides of a square.
The arc AD is part of a circle centre P.
M is the midpoint of BC.
$AB = BC = CD = 4$ and $MP = 5$.
Angle $APD = \theta$ radians.

(a) Show that $\theta = 2.21$ to 3 significant figures. [2]

(b) Find the area of the shaded region. [5]

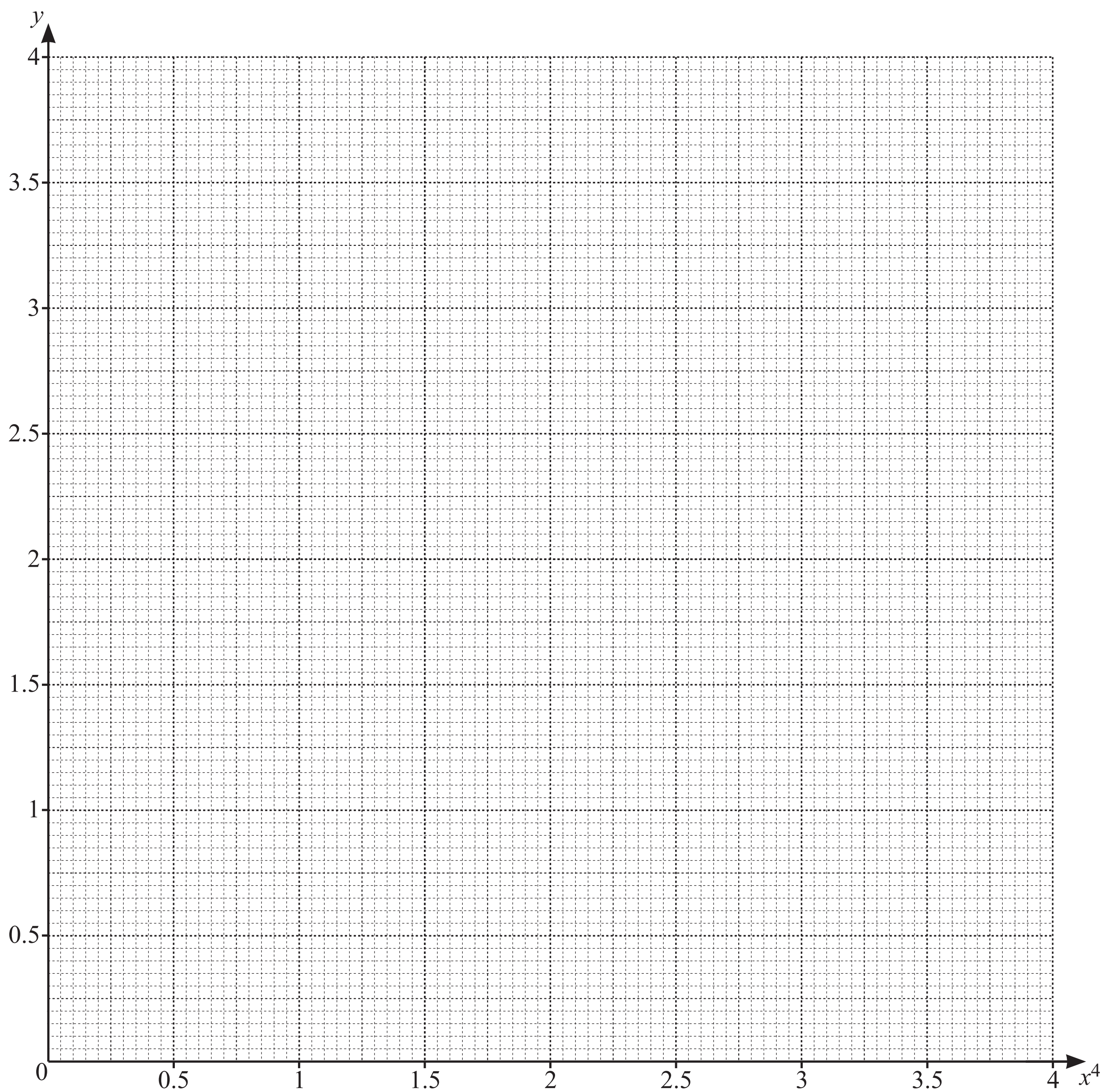
3 **(a)** Expand $(1+2x)(1-2x)$. [1]

(b) Hence find the coefficient of x^5 in the expansion of $(1+2x)^{10}(1-2x)^{12}$. [4]

4 Two variables, x and y, are known to be related by an equation of the form $y = Px^4 + Q$, where P and Q are constants.
In an experiment, the following values of x and y were recorded.

x	0.48	0.95	1.19	1.34	1.40
y	0.23	0.61	1.20	1.81	2.12

(a) On the axes, draw a straight-line graph for y against x^4. [2]



(b) Hence estimate the values of P and Q. [3]

(c) Use your graph to estimate y when $x = 1.05$. [1]

5 In this question time t is in seconds and lengths are in metres.

A particle moves in a straight line.
When $t = 0$ the particle starts from rest.
The particle moves with constant acceleration until, at $t = T$, it reaches a velocity of V.
From $t = T$ until $t = 3T$ the particle moves with constant velocity V.
Then the particle decelerates uniformly and comes to rest at $t = 60$.

(a) Sketch the velocity-time graph for the motion, showing all the information given above. [2]

(b) It is given that the acceleration during the first part of the journey is 1.5, and the total distance travelled is 1104.

Find the values of T and V. [6]

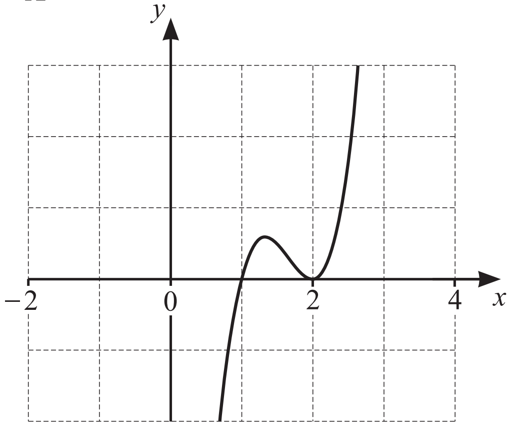
6 **(a)** Show that $\dfrac{\sin\theta}{\sec\theta-\tan\theta}+\dfrac{\sin\theta}{\sec\theta+\tan\theta}=2\tan\theta$. [3]

(b) Hence solve the equation $\dfrac{\sin\theta}{\sec\theta-\tan\theta}+\dfrac{\sin\theta}{\sec\theta+\tan\theta}=\cos\theta$ for $0^\circ \leqslant \theta \leqslant 360^\circ$. [5]

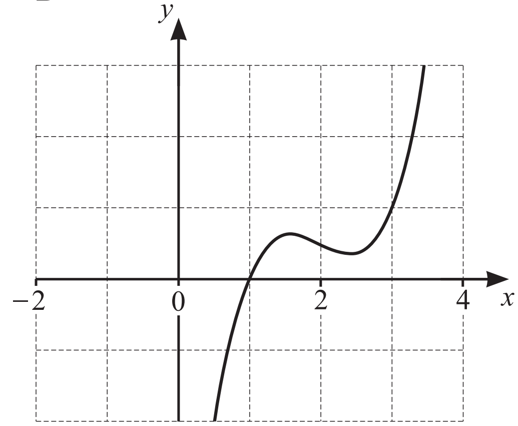
7 Two of the graphs **A**, **B**, **C** and **D** have equations of the form $y = (x-1)(x-p)(x-q)$ where p and q are constants such that $q \geqslant p$ and $q > 1$.

Find the two correct graphs, giving the values of p and q for each. [2]

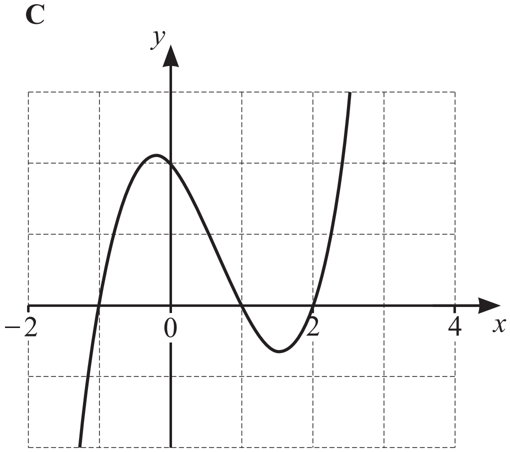
A



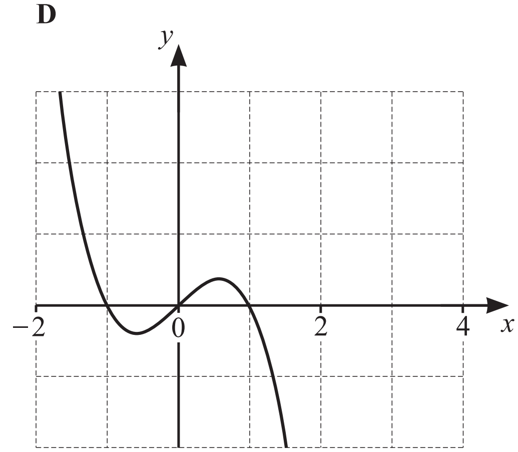
B



C



D



Graph .... $p =$ .... $q =$ ....

Graph .... $p =$ .... $q =$ ....

8 **(a)** The letters A, B, C, D, E are to be arranged in a straight line.

Find the number of possible arrangements if the first letter is A or B and the last letter is **not** E. [2]

(b) Five digits are selected from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9.
No digit may be used more than once in any selection.
The order of the digits in any selection does not matter.

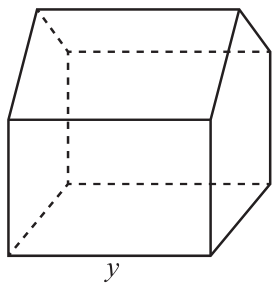
Find how many of these selections can be formed if

(i) the selection contains one even digit and at least three odd digits, [2]

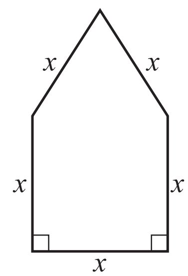
(ii) the selection contains at least one digit greater than 6. [2]

9 In this question lengths are in centimetres.

Prism



Cross-section



The diagram shows a prism whose cross-section is formed by a square of side x and an equilateral triangle of side x.
The length of the prism is y.
The total surface area of the prism is A.

The volume of the prism is $250\left(1+\frac{\sqrt{3}}{4}\right)$.

(a) Show that $A=\left(2+\frac{\sqrt{3}}{2}\right)x^2+\frac{1250}{x}$. [5]

(b) **(i)** Given that x varies, find the minimum value of A. [5]

(ii) Use $\frac{d^2A}{dx^2}$ to show that your value is a minimum. [2]

10 **(a)** Differentiate $x\sin(2x-3)$ with respect to x. [2]

(b) Hence find $\int_0^{\frac{1}{2}} x\cos(2x-3)\,dx$. [4]

DO NOT WRITE IN THIS MARGIN

11 A geometric progression has first term a and common ratio r, where $a \neq 0$, $r > 0$ and $r \neq 1$.
The terms of the geometric progression are denoted by $u_1, u_2, u_3, \ldots$.

(a) Given that $u_{n+1} - u_n = \frac{1}{6}\left(u_{n+3} - u_{n+1}\right)$ show that $r^2 + r - 6 = 0$. [4]

(b) It is also given that $u_{k+2} - u_k = 48a$ for some integer k.

Find the value of r and the value of k. [4]

Question 12 is on the back page.

12 Solve the equation $\operatorname{cosec}^2 2x + \dfrac{2}{\tan 2x} = 1$ for $-\dfrac{\pi}{2} \leqslant x \leqslant \dfrac{\pi}{2}$. [7]