Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS   **0580/22**

Paper 2 Non-calculator (Extended)   **October/November 2025**

                                                              2 hours

You must answer on the question paper.

You will need: Geometrical instruments

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 may use tracing paper.
- You must show all necessary working clearly.

INFORMATION
- The total mark for this paper is 100.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages.

List of formulas

|	
Area, A, of triangle, base b, height h.	$A = \dfrac{1}{2}bh$
Area, A, of circle of radius r.	$A = \pi r^2$
Circumference, C, of circle of radius r.	$C = 2\pi r$
Curved surface area, A, of cylinder of radius r, height h.	$A = 2\pi rh$
Curved surface area, A, of cone of radius r, sloping edge l.	$A = \pi rl$
Surface area, A, of sphere of radius r.	$A = 4\pi r^2$
Volume, V, of prism, cross-sectional area A, length l.	$V = Al$
Volume, V, of pyramid, base area A, height h.	$V = \dfrac{1}{3}Ah$
Volume, V, of cylinder of radius r, height h.	$V = \pi r^2 h$
Volume, V, of cone of radius r, height h.	$V = \dfrac{1}{3}\pi r^2 h$
Volume, V, of sphere of radius r.	$V = \dfrac{4}{3}\pi r^3$

For the equation $ax^2 + bx + c = 0$, where $a \neq 0$,
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For the triangle shown,
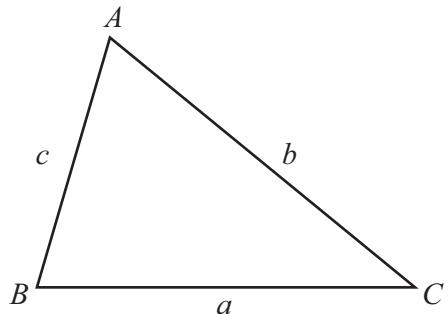
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$\text{Area} = \frac{1}{2}ab\sin C$$

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

1 The temperature at 4 am is $-12\,°C$.
The temperature at 4 pm is $21\,°C$.

Find the increase in temperature from 4 am to 4 pm.

.... °C [1]

2 Find **all** the common factors of 8 and 12.

.... [1]

3 A cuboid has length 6 cm, width 5 cm and height 2.5 cm.

Work out the volume of the cuboid.

.... cm^3 [2]

4 A computer costs $560.
In a sale, this cost is reduced by 20%.

Find the cost of the computer in the sale.

$ .... [2]

5 The pie chart shows some information about the way 600 students travel to school.
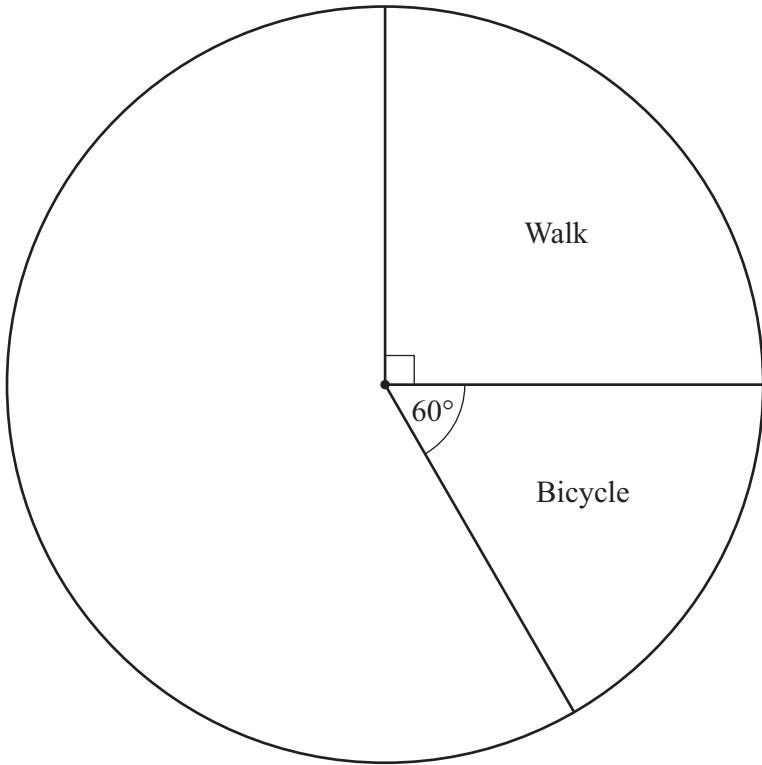
**(a)** Work out the number of students that walk to school.

.... [2]

(b) 120 of the students travel to school by car.
The remaining students travel by bus.

Complete the pie chart.

[3]

6
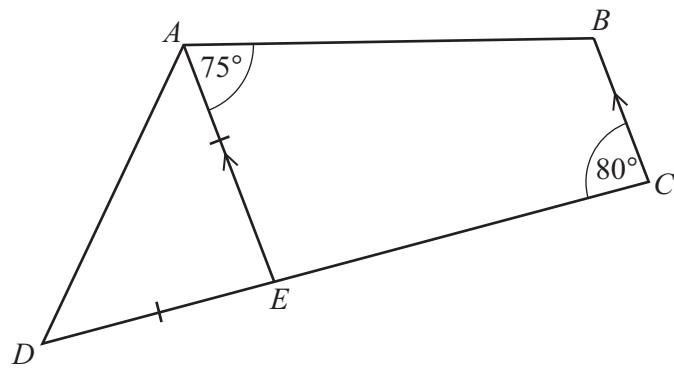
ABCD is a quadrilateral.
E lies on *CD* and *AE* is parallel to *BC*.
EA = ED.

Find

(a) angle *ABC*

Angle *ABC =* .... [1]

(b) angle *AED*

Angle *AED =* .... [1]

(c) angle *DAB*.

Angle *DAB =* .... [2]

7 Represent the inequality $-4 < x \leqslant 3$ on the number line.
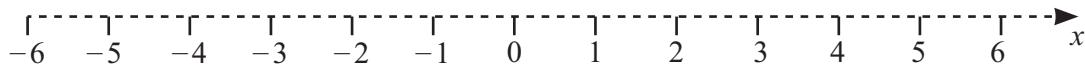
[2]

8   Kemi buys p pens that each cost 40 cents.
       She pays with $20.

       Write an expression, in terms of p, for the change, in **cents**, Kemi receives from the $20.

.... cents [2]

9   Rajid has a full bottle of juice.
       He drinks $\frac{1}{3}$ of the full bottle on Monday.

       He drinks $\frac{3}{7}$ of the full bottle on Tuesday.

       Find the fraction of the bottle of juice remaining.

.... [3]

10 $b = dm + 2mk$

   (a) $d = 3.14$, $m = 7.92$ and $k = 10.16$.

        By rounding each value correct to 1 significant figure, work out an estimate for b.

.... [3]

   (b) Rearrange the formula to make m the subject.

$m =$ .... [2]

NOT TO SCALE
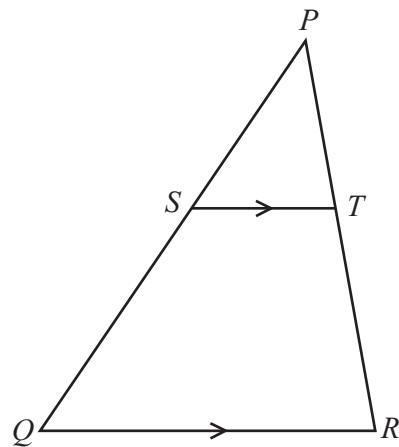
In the diagram, *S* lies on *PQ* and *T* lies on *PR*.
ST is parallel to *QR*.

(a) Explain why triangle *PQR* is mathematically similar to triangle *PST*.
Give a geometrical reason for each statement you make.

....

....

....

.... [3]

(b) *ST* = 3 cm, *QR* = 9 cm and *PS* = 5 cm.

Work out *PQ*.

PQ = ...cm [2]

(c) The area of triangle *PST* is $2k$ cm^2.

Find, in terms of *k*, the area of quadrilateral *QRTS*.

.. cm^2 [2]

12 A fitness club has 100 members.

60 swim (*S*).
70 cycle (*C*).
25 do not swim or cycle.
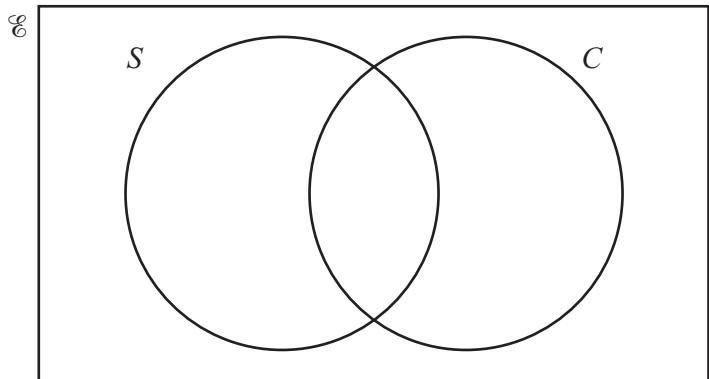
(a) Complete the Venn diagram.

[3]

(b) One member of the fitness club is chosen at random.

For this member, find

(i) P(*C*)

.... [1]

(ii) P(*S* ∩ *C*)

.... [1]

(iii) P(*S* ∪ *C′*).

.... [1]

13 $M = 2^7 \times 3^3 \times 5^2$

(a) Write $14M$ as a product of its prime factors.
Give your answer in index form.

.... [2]

(b) R is an integer.
$\dfrac{M}{R}$ is a cube number.

Find the smallest possible value of R.

$R = $ .... [2]

14 Find the value of

(a) $3^2 \div 3^{-2}$

.... [2]

(b) $16^{-\frac{3}{2}}$.

.... [2]

15 Factorise.

(a) $x^2 - 64$

.... [1]

(b) $5x(x-2y) + 6(x-2y)^2$

.... [2]

16
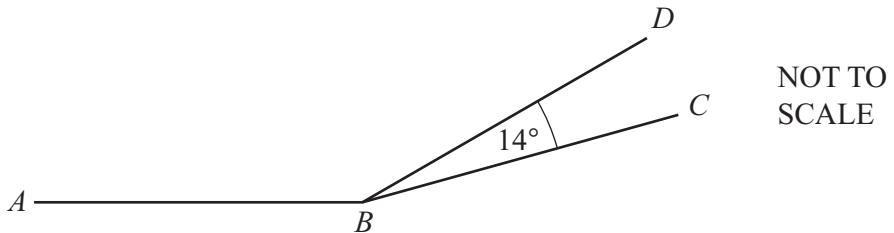
AB and *BD* are two sides of a regular 15-sided polygon.
AB and *BC* are two sides of a regular *n*-sided polygon.
Angle *DBC* = 14°.

Work out the value of *n*.

$n =$ .... [4]

17 B is the point $(-3, 1)$ and D is the point $(-5, 9)$.
BD is a diagonal of the kite $ABCD$.

(a) The ratio of the lengths of the diagonals $BD : AC = 2 : 3$.

Work out the length of AC.
Give your answer as a surd in its simplest form.

.... [5]

(b) Find the coordinates of the midpoint of BD.

(..................... , ...) [2]

(c) The diagonal AC of the kite passes through the midpoint of BD.

Find an equation of AC.
Give your answer in the form $y = mx + c$.

$y = $ .... [4]

18 Rationalise the denominator and simplify.

$$\frac{20}{4+\sqrt{6}}$$

.... [3]

19
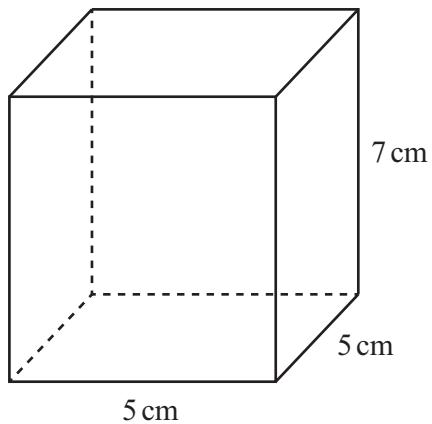
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The diagram shows a box in the shape of a cuboid.
Mala has a straight rod of length 10 cm.

Show that this rod does **not** fit completely inside the box.

[3]

20 $f(x) = \dfrac{21}{2x-1}$, $x \neq \dfrac{1}{2}$ $g(x) = 3x+4$

(a) Find

(i) g(2)

.... [1]

(ii) gf(−1)

.... [2]

(iii) $f^{-1}(x)$.

$f^{-1}(x) =$ .... [3]

(b) Solve   f(x) = g(x).

$x =$ .... or $x =$ .... [5]

21 **(a)**
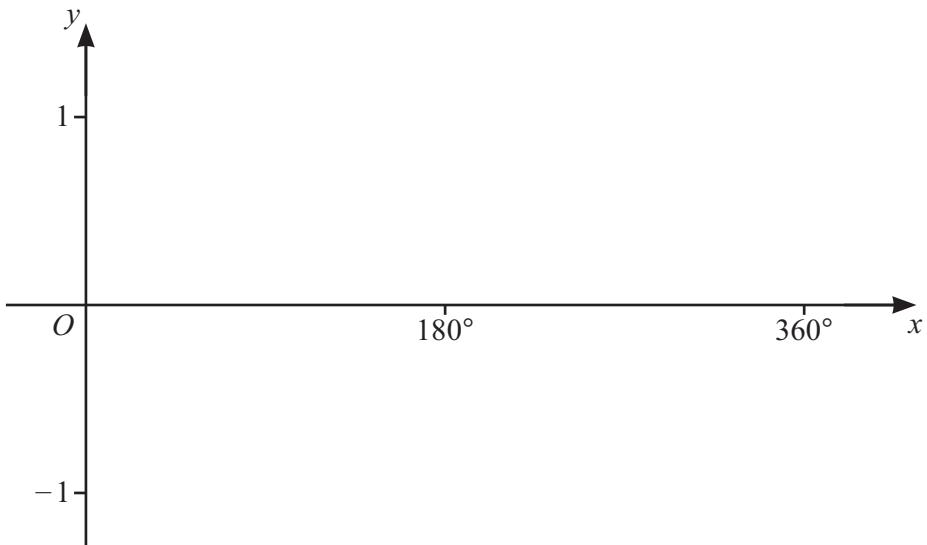
On the diagram, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve the equation $2\cos x + \sqrt{3} = 0$ for $0° \leqslant x \leqslant 360°$.

$x =$ .... or $x =$ .... [3]

22 A graph with equation $y = x^2 + bx + c$ has a minimum point at $(-5, 12)$.

Find the value of b and the value of c.

$b =$ ....

$c =$ ....
[3]

23
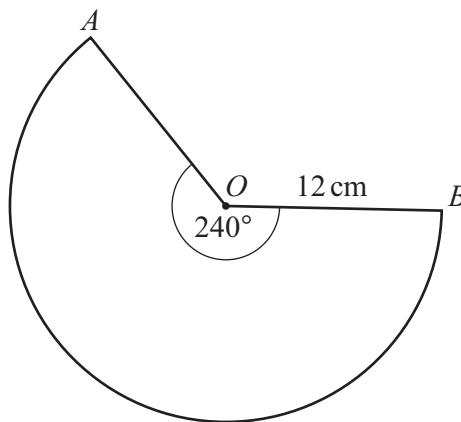
NOT TO
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The diagram shows a major sector, *AOB*, of a circle.
The sector angle is 240° and the radius is 12 cm.

(a) Show that the length of the major arc *AB* is 16π cm.

[1]

(b) *OA* is joined to *OB* to form a cone.

Work out the volume of the cone.

Give your answer in the form $\dfrac{\left(a\sqrt{b}\right)\pi}{3}$ where *a* is an integer and *b* is a prime number.

.... cm^3 [6]

Question 24 is printed on the next page.

24 $\qquad 27^{nx} = (9^x)^2$

Find the value of n.

$n =$ .... [2]