

Cambridge IGCSE[™]

CANDIDATE NAME

CENTRE NUMBER

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MATHEMATICS

0580/22

Paper 2 Non-calculator (Extended)

February/March 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.

A LEVEL

INFORMATION FOR STUDENTS, BY STUDENTS, and an admitted

- 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 20 pages.

List of formulas

Area, A, of triangle, base b, height h.

$$A = \frac{1}{2}bh$$

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.

$$A = \pi r l$$

Surface area, A, of sphere of radius r.

$$A = 4\pi r^2$$

Volume, V, of prism, cross-sectional area A, length I.

$$V = AI$$

Volume, V, of pyramid, base area A, height h.

$$V = \frac{1}{3}Ah$$

Volume, V, of cylinder of radius r, height h.

$$V = \pi r^2 h$$

Volume, V, of cone of radius r, height h.



Volume, V, of sphere of radius r. U D E N T S , B

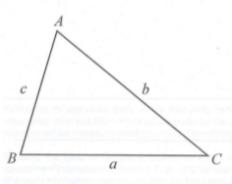
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$$V = \frac{4}{3}\pi r^3 N T$$

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,



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

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

Calculators must not be used in this paper.

1 Oranges cost 220 rupees per kilogram.

Work out the cost of 9 kg of these oranges.

..... rupees [1]

2 Aryan goes on a journey. He leaves home at 11 40 and arrives at 14 18.

Find how many hours and minutes the journey took,

..... h min [1]

3 A quadrilateral has one line of symmetry. The diagonals of the quadrilateral cross at right angles.

LEVEL

Write down the mathematical name of the quadrilateral.

.....[1]

* 0020685084104 *



4

 $4 V = 4mp^2$

(a) Find V when m = 10 and p = -3.

(b) Find the positive value of p when V = 3200 and m = 2.

$$p = \dots$$
 [2]

5 Write these lengths in order of size, starting with the smallest.

 $0.03 \, \text{m}$

2.9 cm

32 mm

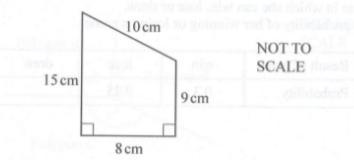
0.00002 km

CR smallest A grant of the control o

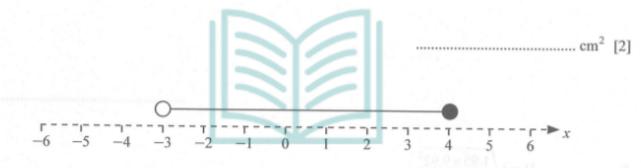
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5



Work out the area of the trapezium.



Write down the inequality for x represented on the number line.

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8 Pryanka plays a game in which she can win, lose or draw. The table shows the probability of her winning or losing a game.

Result of game	win	lose	draw
Probability	0.3	0.25	115 C1

(a) Complete the table.

[2]

(b) Pryanka plays this game 120 times.

Work out the expected number of games she wins.



.....[1]

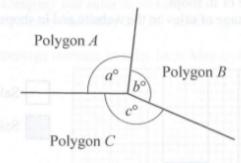
$$D = \sqrt{\frac{1.95 \times 9.92^2}{8.07}}$$

By writing each number correct to 1 significant figure, work out an estimate for D.

FOR STUDENTS, BY STUDENTS

n = [3]

10



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Three regular polygons A, B and C meet at a point. The interior angles of the polygons are in the ratio a:b:c=3:4:5.

Show that polygon C has twice the number of sides as polygon B.



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[5]

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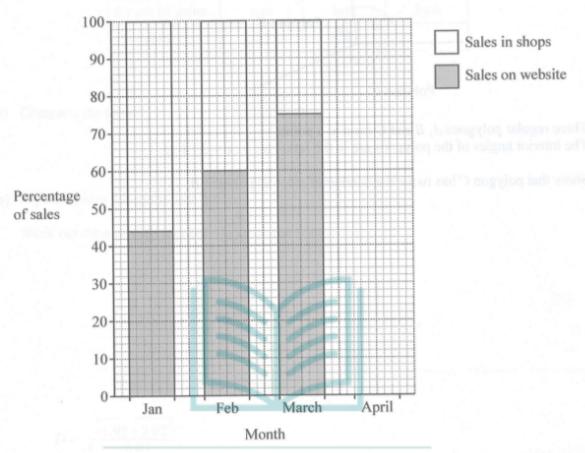


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Turn over



A company sells items either on a website or in shops.
The composite bar chart shows the percentage of sales on the website and in shops for January, February and March.



(a) In April, $\frac{17}{20}$ of the company's sales were on the website.

On the grid, draw the bar for April.

EVEL

[2]

(b) In February, the company had sales of \$3.5 million.

Work out the value of sales in shops in February.

\$..... million [3]



(c) In May, the company had sales of \$6 million. In June, the company had sales of \$7.5 million.

Find the percentage increase in sales from May to June.

% [3	R Januarés en ro ammes au	01	FO.
		%	[3

(d) In 2024, the company had total sales of \$52 million. This was an increase of 30% on the total sales for 2023.

Work out the total sales in 2023.



\$..... million [2]

12 (a) Write as a single fraction in its simplest form.

CRACK $A^{\frac{x}{4} + \frac{3x}{8} - \frac{x+2}{12}}$ **VEL**

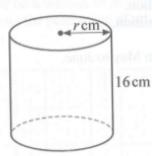
FOR STUDENTS, BY STUDENTS

.....[3

(b) Factorise.

$$3x(a+4y) - ay - 4y^2$$

.....[1]



NOT TO SCALE

The diagram shows a cylinder with radius r cm and height 16 cm. A sphere has radius 3 cm.

The volume of the cylinder is equal to the volume of the sphere.

Find the value of r.

* 0020685084110 *



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11

SCALE E20° 45° G110°

A, B, C, D and E lie on a circle. FG is a tangent to the circle at C.

Angle $BAD = 110^{\circ}$, angle $ADB = 20^{\circ}$ and angle $BEC = 45^{\circ}$

(a) Find angle BCD. Give a geometrical reason for your answer.

Angle BCD = because

(b) (i) Find angle DBC.

NOT TO

Find angle DCG.

Angle $DCG = \dots$ [1]



- 15 Point A has coordinates (-4, 1) and $\overrightarrow{BA} = \begin{pmatrix} -5 \\ -12 \end{pmatrix}$.
 - (a) Find the coordinates of point B.



(b) Point C has coordinates (5, -2).

Find the vector \overrightarrow{CA} .

$$\overrightarrow{CA} = \left(\begin{array}{c} \end{array}\right) [2]$$

(c) $\overrightarrow{EF} = 3\overrightarrow{BA}$ Find $|\overrightarrow{EF}|$.



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FOR STUDENTS, BY STUDENTS

.....[3]



16 The stem-and-leaf diagram shows the mass of each of 13 packets.

3	1	2	8			
4	0	1	2	3	3	8
5	1	2	3	4		

Key: 3 1 represents 31 g

(a) Work out the interquartile range.

.....g [3]

(b) Two of these packets are chosen at random.

Find the probability that the one packet has a mass of more than 50 g and the other packet has a mass of less than 50 g.

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FOR STUDENTS, BY STUDENTS

.....[3]





17 Work out.

$$\frac{5}{9} + 0.28$$

Give your answer as a fraction in its simplest form.



14

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15

NOT TO SCALE

18 cm

6 cm

7

17 cm

The quadrilateral ACDE is formed by two right-angled triangles ABE and BCD. AC = 17 cm, AE = 18 cm and BD = 6 cm.

(a) Show that $CD = 10 \,\mathrm{cm}$.



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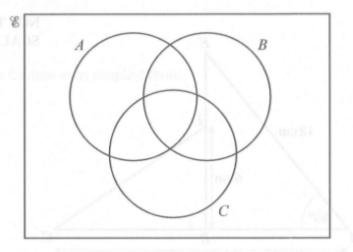
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[5]

(b) Find the perimeter of the quadrilateral *ACDE*. Give your answer in the form $p+k\sqrt{q}$.

.....cm [4]





In the Venn diagram, shade the region $(A \cup B \cup C)'$.

[1]

20 (a) Simplify.

 $\sqrt{300} + \sqrt{48}$



.... [2]

(b) Rationalise the denominator and simplify.

$$\frac{9}{2+\sqrt{7}}$$

CRACK A LEVEL

FOR STUDENTS, BY STUDENTS

.....[3]

21 (a) Write down the coordinates of the point where the graph of y = 5x - 3 crosses the y - axis.

(.....) [1]

(b) A is the point (1,7) and B is the point (5,15).

Find the equation of the perpendicular bisector of the line AB. Give your answer in the form y = mx + c.



CRACK A LEWEL [5]

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- 22 A curve has equation $y = x^3 + x^2 x$. The curve has a stationary point at $\left(\frac{1}{3}, -\frac{5}{27}\right)$.
 - (a) Find the coordinates of the other stationary point.



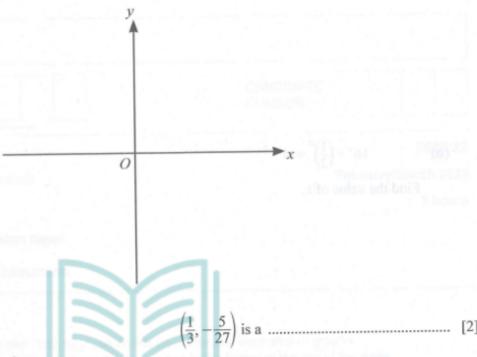
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(.....) [5]



(b) By sketching the graph of $y = x^3 + x^2 - x$, determine whether the stationary point $\left(\frac{1}{3}, -\frac{5}{27}\right)$ is a maximum or a minimum.



(c) The equation $x^3 + x^2 - x = k$ has fewer than 3 solutions.

Find the range of possible values for k.

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FOR STUDENTS, BY STUDENTS [2]

Question 23 is printed on the next page.





23 (a) Simplify $\left(\frac{x^2}{4}\right)^{\frac{3}{2}}$.



(b)
$$16^x \times \left(\frac{1}{2}\right)^x = 4^{x+3}$$

Find the value of x.



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Ouestion 23 is printed on the next page.

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