

**Cambridge IGCSE™**CANDIDATE
NAMECENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

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.

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 **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 .

$$A = \pi rl$$

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 .

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

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

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

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

$$V = \frac{1}{3}\pi r^2 h$$

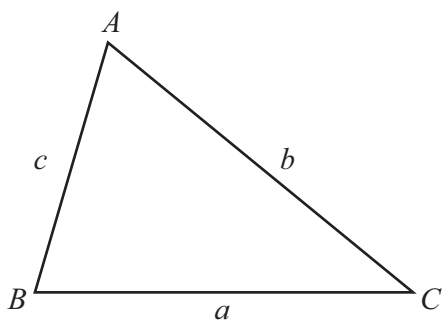
Volume, V , of sphere of radius r .

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

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 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.

Write down the mathematical name of the quadrilateral.

..... [1]





4

$$V = 4mp^2$$

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

$$V = \dots\dots\dots [2]$$

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

$$p = \dots\dots\dots [2]$$

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

0.03 m

2.9 cm

32 mm

0.000 02 km

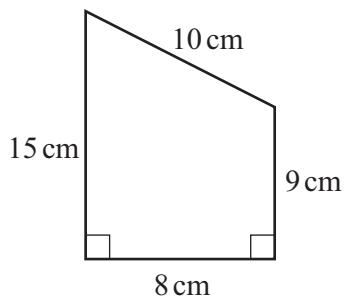
.....,,, [2]
smallest





5

6

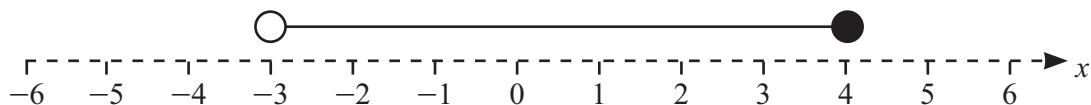


NOT TO
SCALE

Work out the area of the trapezium.

..... cm^2 [2]

7



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

..... [2]





- 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	

- (a) Complete the table.

[2]

- (b) Pryanka plays this game 120 times.

Work out the expected number of games she wins.

..... [1]

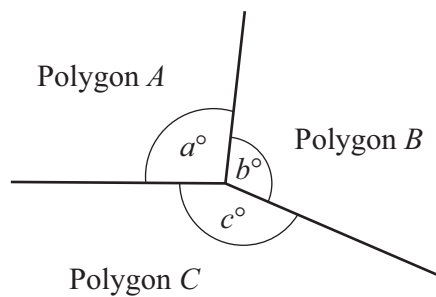
9

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

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

$D =$ [3]





NOT TO
SCALE

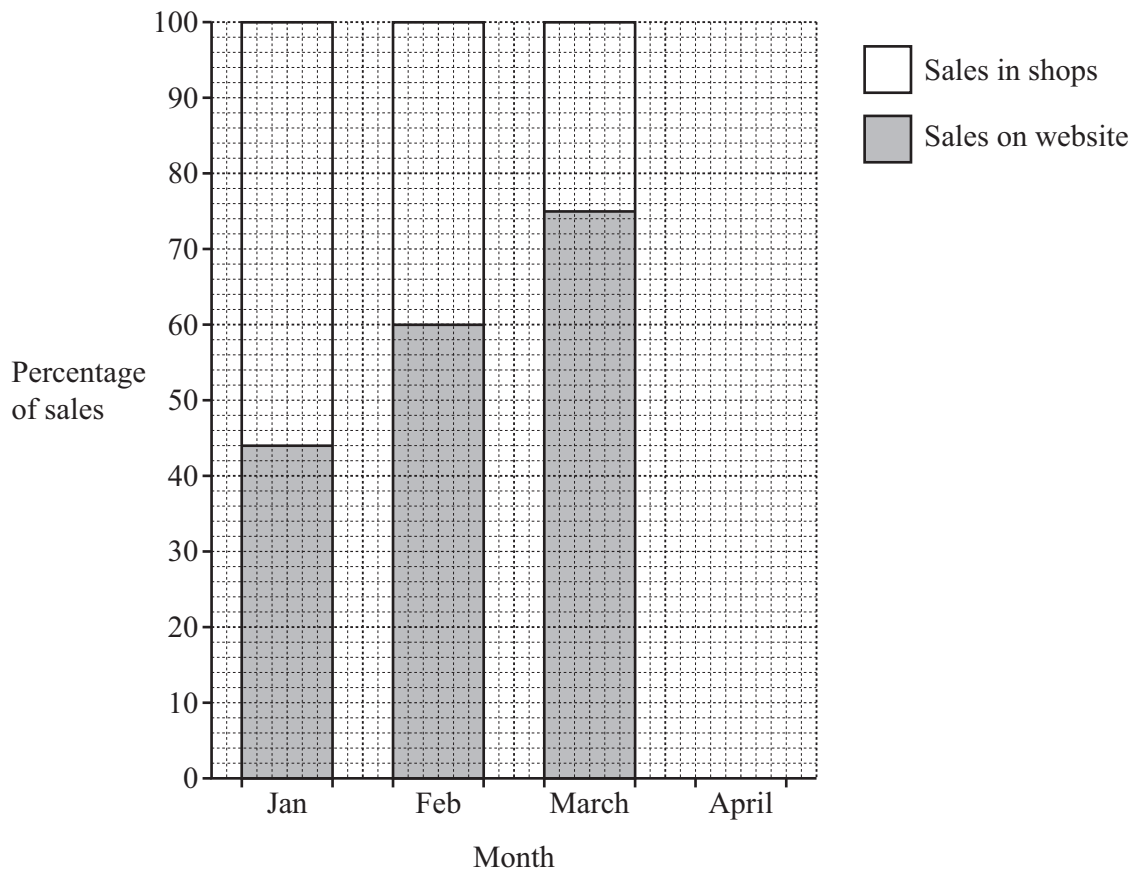
Three regular polygons A , B and C meet at a point.
The interior angles of the polygons are in the ratio $a : b : c = 3 : 4 : 5$.

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

[5]



- 11 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.

[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]

- (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.

$$\frac{x}{4} + \frac{3x}{8} - \frac{x+2}{12}$$

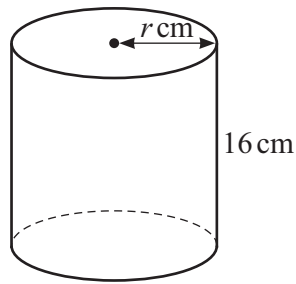
..... [3]

- (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.

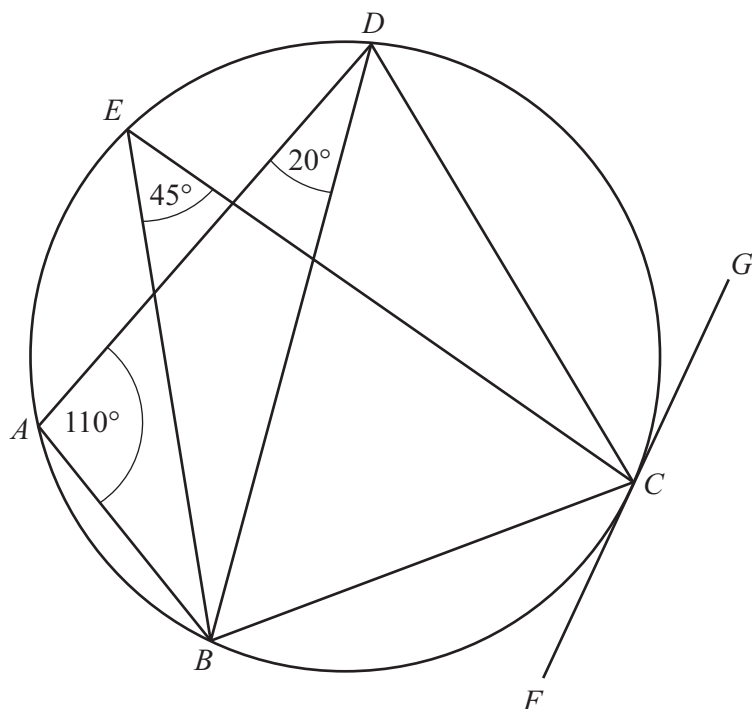
A sphere has radius 3 cm.

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

Find the value of r .

$r = \dots\dots\dots$ [4]



NOT TO
SCALE

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 $BCD = \dots\dots\dots$ because $\dots\dots\dots$

$\dots\dots\dots$ [2]

(b) (i) Find angle DBC .

Angle $DBC = \dots\dots\dots$ [2]

(ii) Find angle DCG .

Angle $DCG = \dots\dots\dots$ [1]





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

(a) Find the coordinates of point B .

(..... ,) [2]

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

Find the vector $\overrightarrow{CA}$.

$\overrightarrow{CA} = \begin{pmatrix} \\ \end{pmatrix}$ [2]

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

Find $|\overrightarrow{EF}|$.

..... [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.

..... [3]





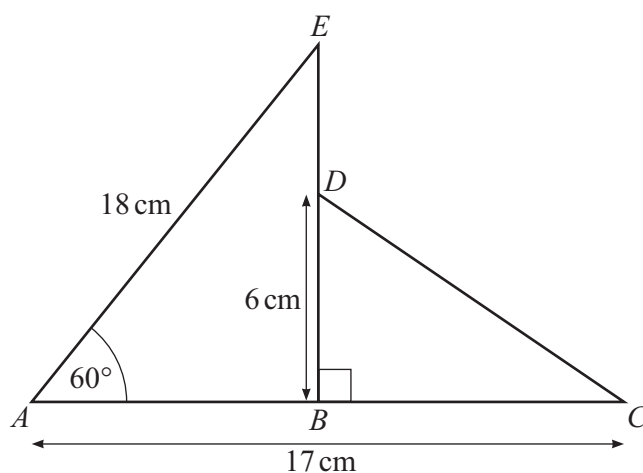
17 Work out.

$$\frac{5}{9} + 0.2\dot{8}$$

Give your answer as a fraction in its simplest form.

..... [4]



NOT TO
SCALE

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 $CD = 10$ cm.

[5]

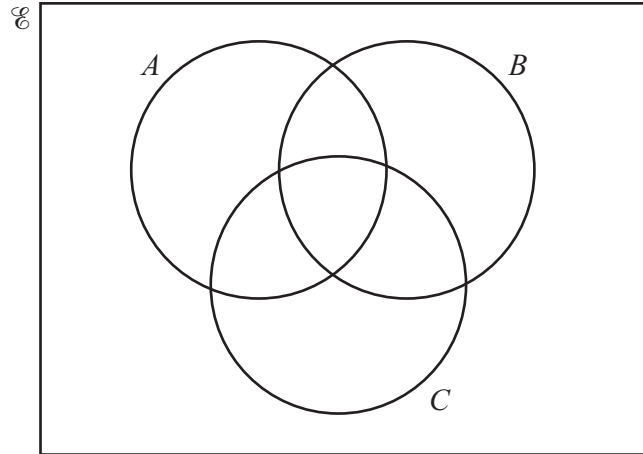
(b) Find the perimeter of the quadrilateral $ACDE$.
 Give your answer in the form $p + k\sqrt{q}$.

..... cm [4]





19



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.

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

..... [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 $y = mx + c$.

$y =$ [5]





22 A curve has equation $y = x^3 + x^2 - x$.

The curve has a stationary point at $\left(\frac{1}{3}, -\frac{5}{27}\right)$.

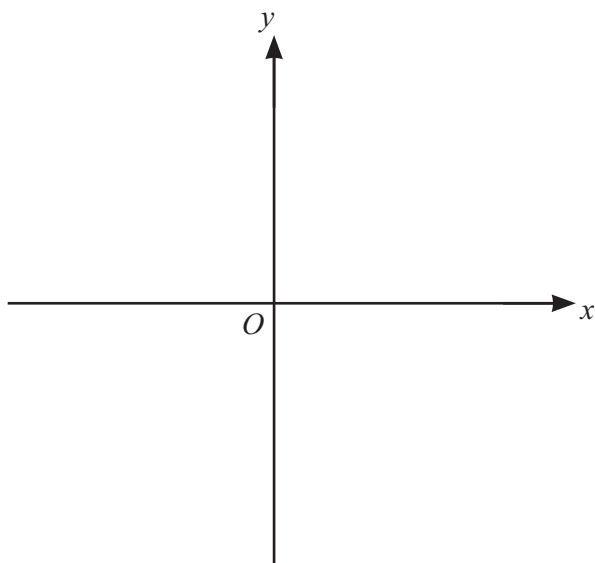
(a) Find the coordinates of the other stationary point.

(..... ,) [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.



$\left(\frac{1}{3}, -\frac{5}{27}\right)$ is a [2]

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

Find the range of possible values for k .

..... [2]

Question 23 is printed on the next page.





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

..... [2]

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

Find the value of x .

$x =$ [4]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

