## Cambridge IGCSE ${ }^{\text {TM }}$



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 and you will be given marks for correct methods even if your answer is incorrect.
- All answers should be given in their simplest form.


## INFORMATION

- The total mark for this paper is 40 .
- The number of marks for each question or part question is shown in brackets [ ].


## Formula List

For the equation

$$
a x^{2}+b x+c=0 \quad x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}
$$

Curved surface area, $A$, of cylinder of radius $r$, height $h$.
$A=2 \pi r h$

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

Curved surface area, $A$, of sphere of radius $r$.
$A=4 \pi r^{2}$

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

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


$$
\begin{aligned}
& \frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C} \\
& a^{2}=b^{2}+c^{2}-2 b c \cos A \\
& \text { Area }=\frac{1}{2} b c \sin A
\end{aligned}
$$

## Answer all the questions.

1 Write 0.0301497
(a) correct to 3 decimal places
(b) correct to 4 significant figures.

2 Write down the number of lines of symmetry of a kite.

3 Work out $\frac{5}{6}-\frac{5}{8}$.

4 (a) Solve $11+2 x>5$.
(b) Show your solution to part (a) on this number line.


5 One day Hassan surveys the number of people in the cars passing his house. The results for the first 100 cars are shown in the table.

| Number of people | 1 | 2 | 3 | 4 | 5 | 6 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Frequency | 42 | 23 | 17 | 9 | 7 | 2 |
| Relative frequency |  |  |  |  |  |  |

(a) Complete the table.
(b) A total of 1200 cars pass Hassan's house that day.

Calculate an estimate of the number of these cars with 5 people.

6 The angles of a triangle are in the ratio 2:3:7.
Find each angle.
$7 \quad p=5 \times 10^{7}$
Work out $p^{3}$.
Give your answer in standard form.

8 For this sequence

$$
\begin{array}{lllll}
1 & 6 & 11 & 16 & 21
\end{array}
$$

(a) find the next term
(b) find an expression for the $n$th term.

9


NOT TO
SCALE


The two bottles are mathematically similar. The height of the large bottle is 30 cm . The height of the small bottle is 24 cm . The volume of the large bottle is $250 \mathrm{~cm}^{3}$.

Calculate the volume of the small bottle.

$A, B, C$ and $D$ are points on the circle centre $O$.
$P D Q$ is a tangent to the circle at $D$.
Angle $B A D=51^{\circ}$ and angle $P D A=64^{\circ}$.
Find
(a) angle $B C D$

Angle $B C D=$
(b) angle $A B D$

Angle $A B D=$
(c) the obtuse angle $B O D$.

Angle $B O D=$

11 Expand and simplify.

$$
(4+2 \sqrt{3})(5-\sqrt{3})
$$

$12 y$ is inversely proportional to $x^{2}$. When $x=2, y=10$.

Find $y$ in terms of $x$.

$$
y=
$$

13


The area of the shaded segment is $(a \pi+b) \mathrm{cm}^{2}$.
Find the value of $a$ and the value of $b$.
$\qquad$
$a=$
$b=$

Questions 14 and 15 are printed on the next page.

14 Solve $2 \log x-3 \log 2+\log 5=3$.

$$
\begin{equation*}
x= \tag{4}
\end{equation*}
$$

15 Write as a single fraction in its simplest form.

$$
\frac{3}{x-1}-\frac{2}{2 x+5}
$$

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