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8296767608

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/43**

Paper 4 Calculator (Extended) **May/June 2025**

1 hour 30 minutes

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.
- You should use a graphic display calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly. You will be given marks for correct methods, including sketches, even if your answer is incorrect.
- 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 75.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Any blank pages are indicated.

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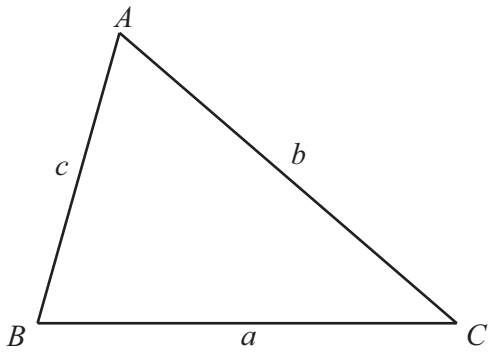
List of formulas

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 $a \neq 0$,	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$



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

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

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

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1 Complete the statements.

A rhombus has rotational symmetry of order .....

A parallelogram has ..... lines of symmetry.

[2]

2 Convert 0.027 kilometres into centimetres.

..... cm [1]

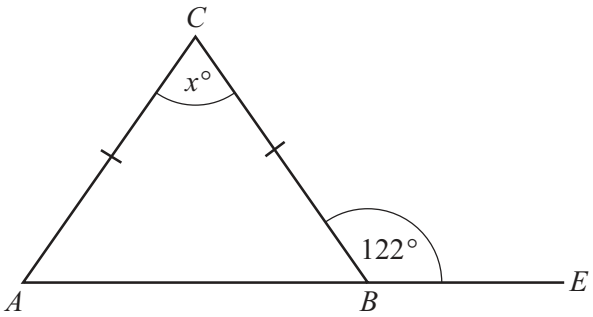
3 Calculate.

$$\sqrt[3]{1-\frac{2.7}{3.5}}$$

Give your answer correct to 4 significant figures.

..... [2]

4



NOT TO SCALE

In the diagram, $CA = CB$ and ABE is a straight line.

Find the value of x.

$x =$ ..... [2]

5 Solve.

$$0 = 4x - 11$$

$x =$ ..... [1]

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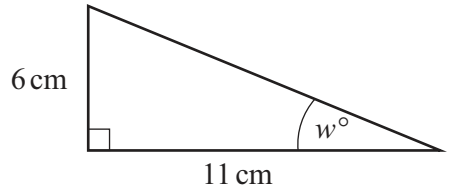

NOT TO SCALE

Calculate the value of w.

$w =$ ..... [2]

7 Omar records the time he spends revising and his test score for each of 8 tests.
The maximum score on each test is 20.
The table shows the results.

Time revising (x minutes)	15	15	18	25	30	35	35	40
Test score (y)	11	10	12	13	15	16	18	18

(a) Write down the type of correlation between the time Omar spent revising and his test score.

..... [1]

(b) (i) Find the equation of the regression line for y in terms of x.

$y =$ ..... [2]

(ii) Use your answer to **part (b)(i)** to estimate Omar's test score when he spends 20 minutes revising.

..... [1]

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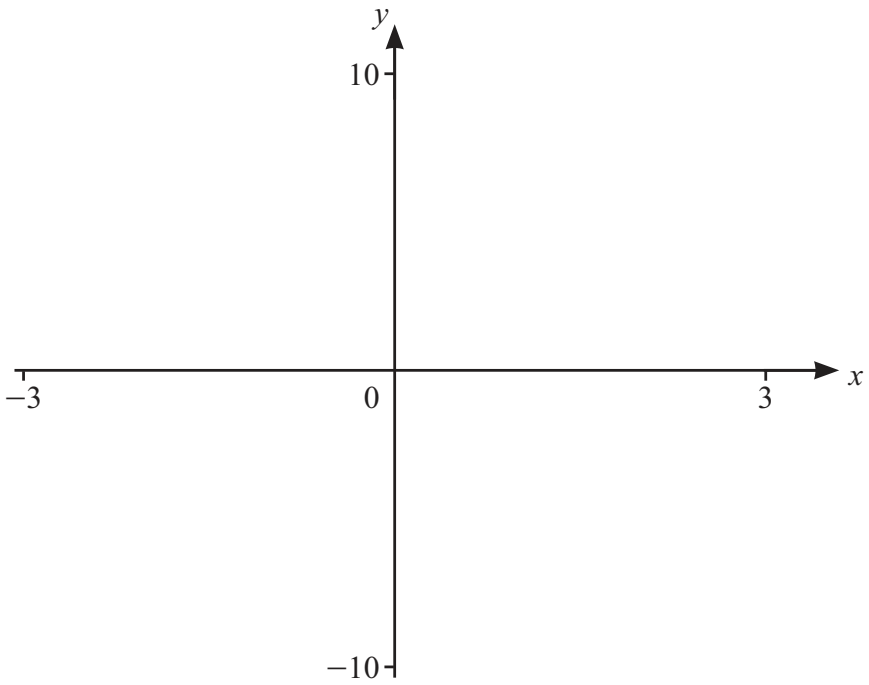

$f(x) = \frac{3}{x} - x^2$

(a) On the diagram, sketch the graph of $y = f(x)$ for values of x between -3 and 3. [3]

(b) Find the zero of $f(x)$.

..... [1]

(c) Find the equation of the asymptote to the graph.

..... [1]

(d) Find the coordinates of the local maximum point.

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

(e) The equation $f(x) = k$ has one solution.

Find the range of values of k.

..... [1]

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9 The volume of a sphere is 96.5 cm^3.

Calculate the radius of the sphere.

..... cm [2]

10 The speed of each of 155 cars passing a school gate is recorded.
The results are shown in the table.

Speed (v km/h)	$10 < v \leqslant 20$	$20 < v \leqslant 30$	$30 < v \leqslant 35$	$35 < v \leqslant 40$	$40 < v \leqslant 60$
Frequency	7	23	36	49	40

Calculate an estimate of the mean speed.

..... km/h [2]

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11 $\overrightarrow{PQ} = \begin{pmatrix} 5 \\ -4 \end{pmatrix}$

Find $\left|\overrightarrow{PQ}\right|$.

$\left|\overrightarrow{PQ}\right| =$ ..... [2]

12 $w \propto \sqrt{x+1}$
When $x = 3$, $w = 8$.

Find x when $w = 20$.

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

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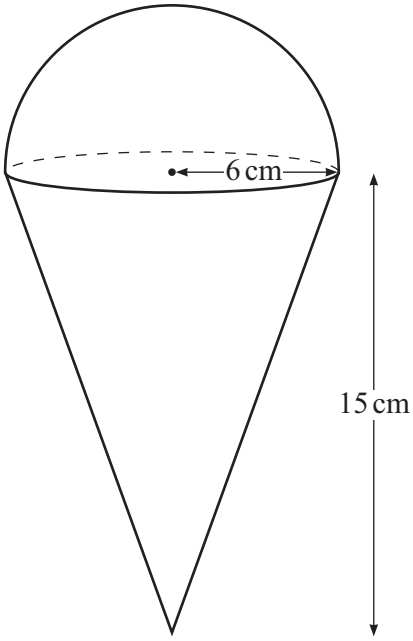

NOT TO SCALE

A solid is formed from a cone and a hemisphere.
The cone and the hemisphere each have a radius of 6 cm.
The cone has a height of 15 cm.

Find the volume of the solid.

..... cm^3 [3]

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14 Priya buys pieces of fruit.
The pieces of fruit are apples and oranges.

The price of 1 apple is x cents.
The price of 1 orange is $(x+10)$ cents.

Priya spends 420 cents on apples.

(a) Write down an expression, in terms of x, for the number of apples she buys.

..... [1]

(b) Priya also spends 420 cents on oranges.
She buys 13 pieces of fruit.

(i) Show that $13x^2 - 710x - 4200 = 0$.

[3]

(ii) Factorise $13x^2 - 710x - 4200$.

..... [2]

(iii) Find the cost of one orange.

..... cents [2]

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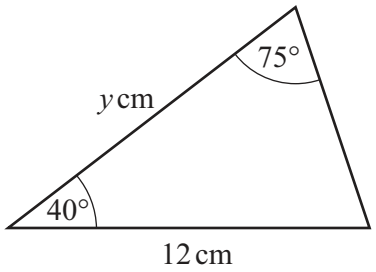
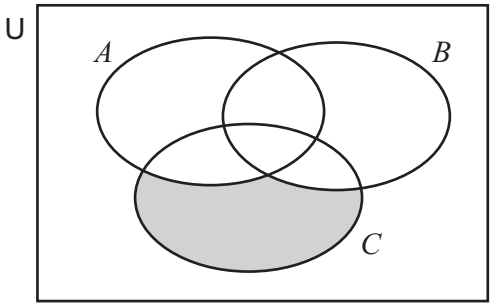


NOT TO SCALE

Calculate the value of y.

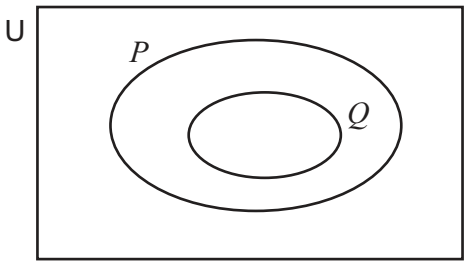
$y =$ ..... [4]

16 **(a)** Use set notation to describe the shaded region.



..... [1]

(b) Shade $P \cap Q'$.



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17 $f(x) = 3 - 2x$ $g(x) = 1 - 5x$

(a) Find $f(-2)$.

..... [1]

(b) Find x when $f(x) = 6$.

..... [2]

(c) Find $fg(x)$.
Give your answer in its simplest form.

..... [2]

(d) Find $g^{-1}(x)$.

$g^{-1}(x) =$ ..... [2]

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18 **(a)** Bruce buys a new car on 1 January 2022.
On 1 January 2023 the value of the car has decreased by 20%.
On 1 January 2024 the value of the car has decreased by 15% of its value on 1 January 2023.

Find the overall percentage decrease in the value of the car on 1 January 2024.

..... % [2]

(b) Sangita buys a car with a value of $20 000.
The value of the car decreases exponentially at a rate of 5% per year.

Calculate the number of complete years it will take for the value of the car to decrease from $20 000 to $8000.

..... [4]

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(c) Sunil buys a car.
The value of the car decreases exponentially at a rate of 6% per year.
At the end of 9 years the value of the car is $8022.

Calculate the original value of the car.

$ ..... [2]

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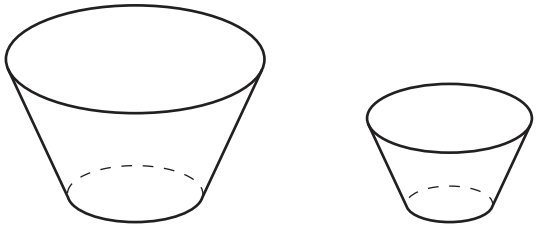

NOT TO SCALE

The two solids are mathematically similar.

The volume of the large solid is 416 cm^3.
The volume of the small solid is 52 cm^3.

The total surface area of the small solid is 60 cm^2.

Calculate the total surface area of the large solid.

..... cm^2 [3]

20 Simplify.

$$\frac{3x-5}{3xy-3x-5y+5}$$

..... [3]

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21 A is the point $(-2, 8)$ and B is the point $(1, 9)$.
The perpendicular bisector of the line AB meets the x-axis at the point P.

Find the coordinates of the point P.

(..... , ...) [6]

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