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Cambridge Assessment International Education

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1847018748

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/41**

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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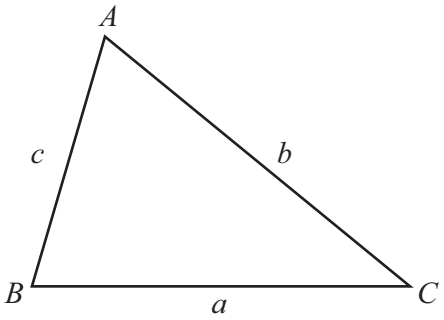
List of formulas

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

For the triangle shown,



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

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

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

1 150 students are each asked how many texts they sent the previous day.
The results are shown in the table.

Number of texts	0	1	2	3	4	5	6
Frequency	18	45	37	24	15	8	3

(a) Find

(i) the mode

..... [1]

(ii) the median

..... [1]

(iii) the range

..... [1]

(iv) the upper quartile.

..... [1]

(b) One of the 150 students is selected at random.

Find the probability that this student sent fewer than 3 texts.

..... [1]

2 **(a)** Find 42 as a percentage of 60.

..... % [1]

(b) Aisha's rate of pay is \$17.50 per hour.
She receives a pay rise of 8%.

Calculate Aisha's new rate of pay per hour.

\$ ..... [2]

3 **(a)** Expand.

$x^2(3x-2)$

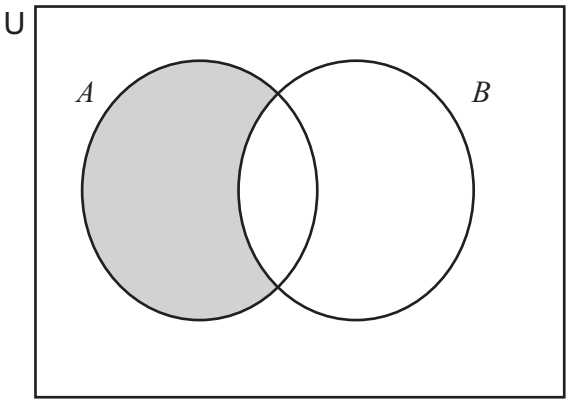
..... [1]

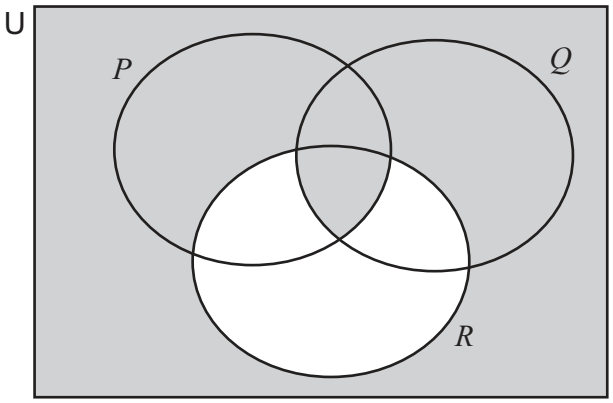
(b) Expand and simplify.

$2(3x-2)-5(1-4x)$

..... [2]

4 Use set notation to describe each of the shaded regions.





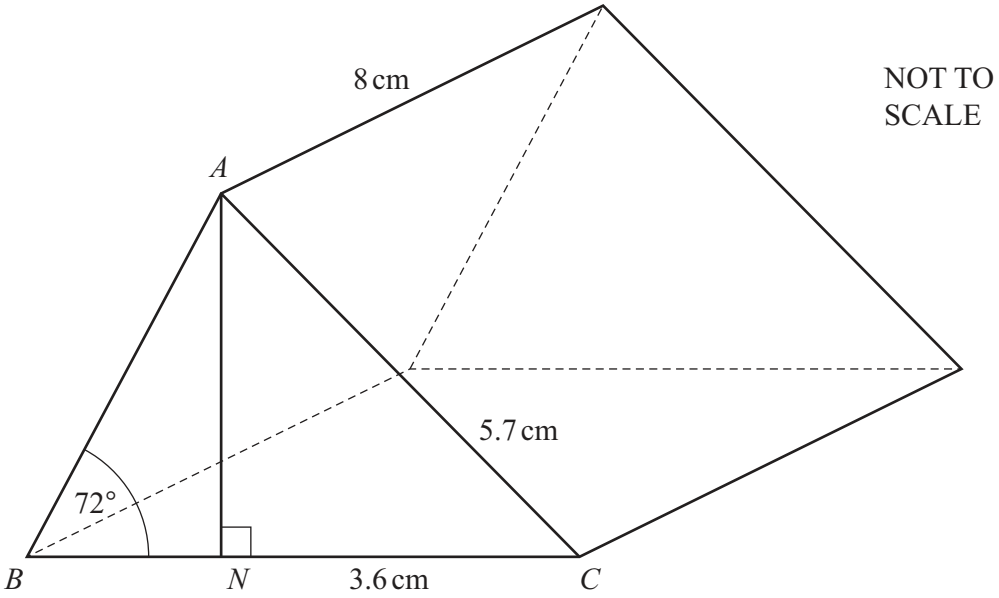
.... [2]

5 $s = \frac{u+v}{2} \times t$

Find s when $u = 4.3$, $v = 9.5$ and $t = 8.5$.

$s =$ ..... [1]

6



Triangle ABC is the cross-section of a prism.
$AC = 5.7$ cm, $NC = 3.6$ cm and the length of the prism is 8 cm.
Angle $ABN = 72°$ and angle $ANC = 90°$.

(a) AN is the perpendicular height of the triangle.

Show that $AN = 4.42$ cm correct to 3 significant figures.

[2]

(b) Calculate the volume of the prism.

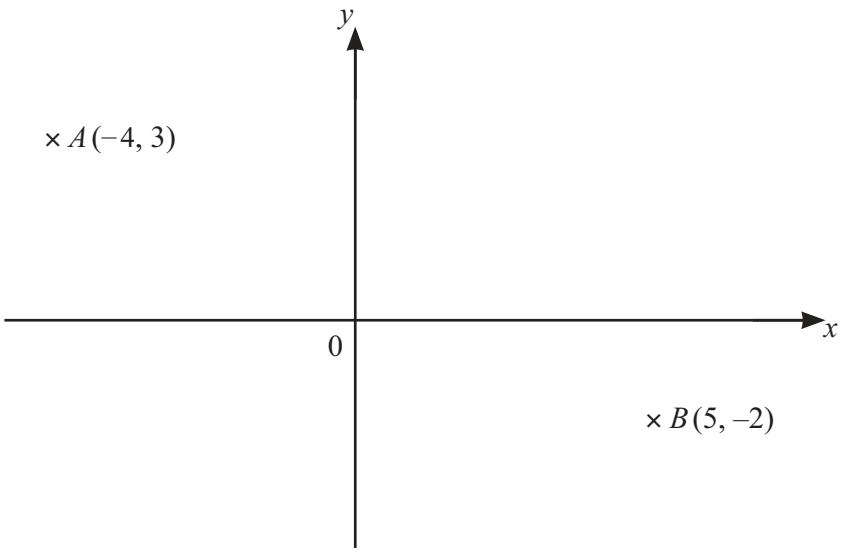
..... cm^3 [5]

7 Simplify.

$$2x^3y^4 \times (4x^2y)^3$$

..... [3]

8



NOT TO SCALE

Point A is translated to point B.

Find $\overrightarrow{AB}$.

( ) [2]

9 The value of a car depreciates exponentially by 15% each year.
On 1 January 2023 its value was $20 400.

(a) Find the value of the car on

(i) 1 January 2022

$ ..... [2]

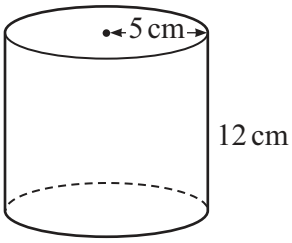
(ii) 1 January 2025.

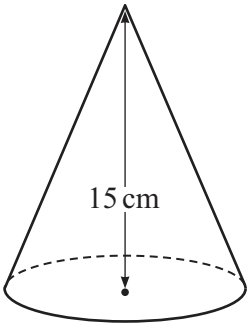
$ ..... [2]

(b) Find the year in which the value of the car on 1 January will first be less than $5000.

..... [4]

10





NOT TO SCALE

The diagram shows a solid cylinder and a solid cone.

The radius of the cylinder is 5 cm and its height is 12 cm.
The height of the cone is 15 cm.
The volume of the cylinder is equal to the volume of the cone.

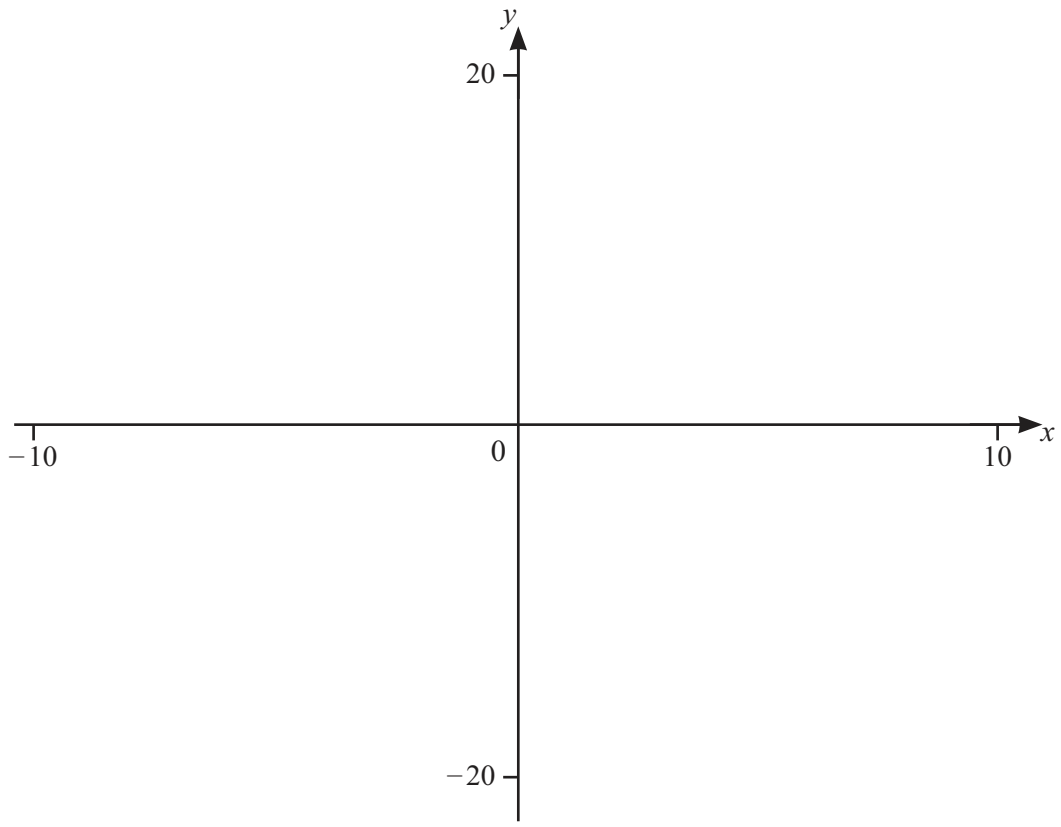
(a) Show that the volume of the cylinder is $300\pi\,\text{cm}^3$.

[1]

(b) Find the total surface area of the cone.

..... cm^2 [5]

11



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

(a) Sketch the graph of $y = f(x)$ for values of x between -10 and 10. [3]

(b) Find the coordinates of the local minimum.

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

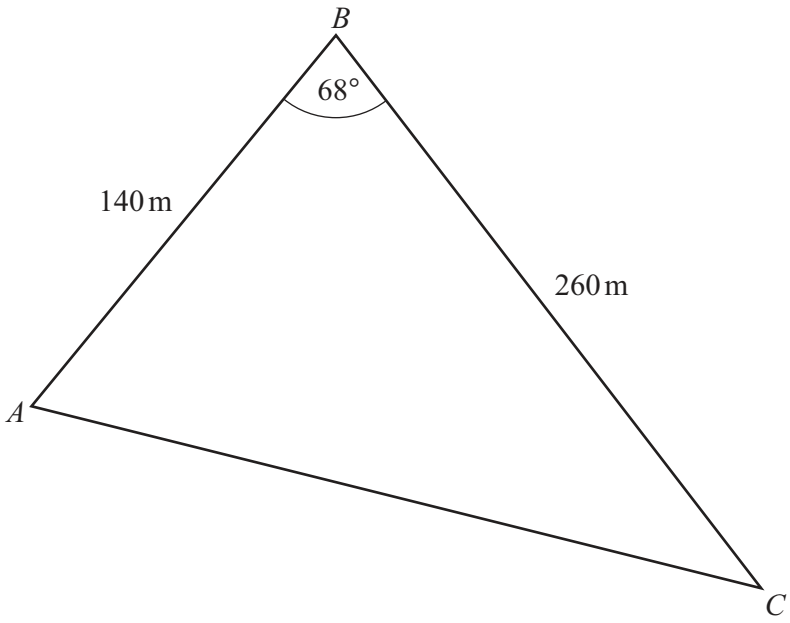
(c) Write down the equations of the asymptotes to the graph of $y = f(x)$ that are parallel to the y-axis.

..... [2]

(d) Solve $f(x) > x + 7$.

..... [4]

12



NOT TO SCALE

The diagram shows a triangular field.
$AB = 140$ m and $BC = 260$ m.
Angle $ABC = 68°$.

(a) Show that $AC = 244.8$ m correct to 1 decimal place.

[3]

(b) Giselle walks directly from A to C.

Calculate the distance Giselle is from A when she is closest to B.

..... m [5]

13 Pierre drives from town P to town Q and then to town R.
The distance from P to Q is 112 km.
The distance from Q to R is 87 km.

The average speed from P to Q is x km/h.
The average speed from Q to R is $(x+10)$ km/h.
The total time for the journey from P to Q to R is 3 hours.

(a) Show that $3x^2 - 169x - 1120 = 0$.

[4]

(b) (i) Solve $3x^2 - 169x - 1120 = 0$.
You must show your working.

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

(ii) Find the average speed from Q to R.

..... km/h [1]

14 Ahmed records the mass of each of 50 pumpkins.
The results are shown in the table.

Mass (m kg)	$0 < m \leqslant 2$	$2 < m \leqslant 5$	$5 < m \leqslant 10$	$10 < m \leqslant 15$	$15 < m \leqslant 25$
Frequency	13	17	10	7	3

(a) Calculate an estimate of the mean.

..... kg [2]

(b) Ahmed picks two of the 50 pumpkins at random.

Find the probability that one of these pumpkins has a mass greater than 10 kg and the other pumpkin has a mass of not more than 2 kg.

..... [3]

15

NOT TO SCALE

These two bottles are mathematically similar.
The capacity of the small bottle is 0.5 litres.
The capacity of the large bottle is 1 litre.
The height of the large bottle is 25 cm.

Calculate the height of the small bottle.

.....cm [3]

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