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8004745082

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/21**

Paper 2 Non-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.
- Calculators must **not** be used in this paper.
- You may use tracing paper.
- You must show all necessary working clearly. You will be given marks for correct methods even if your answer is incorrect.

INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].

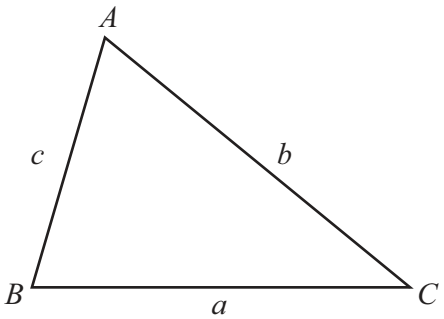
This document has **16** pages. Any blank pages are indicated.

[Turn over

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 This is a list of numbers.

$3.142 \qquad \sqrt{125} \qquad 125 \qquad 81 \qquad 7\frac{2}{3}$

From this list write down

(a) a cube number

..... [1]

(b) an irrational number.

..... [1]

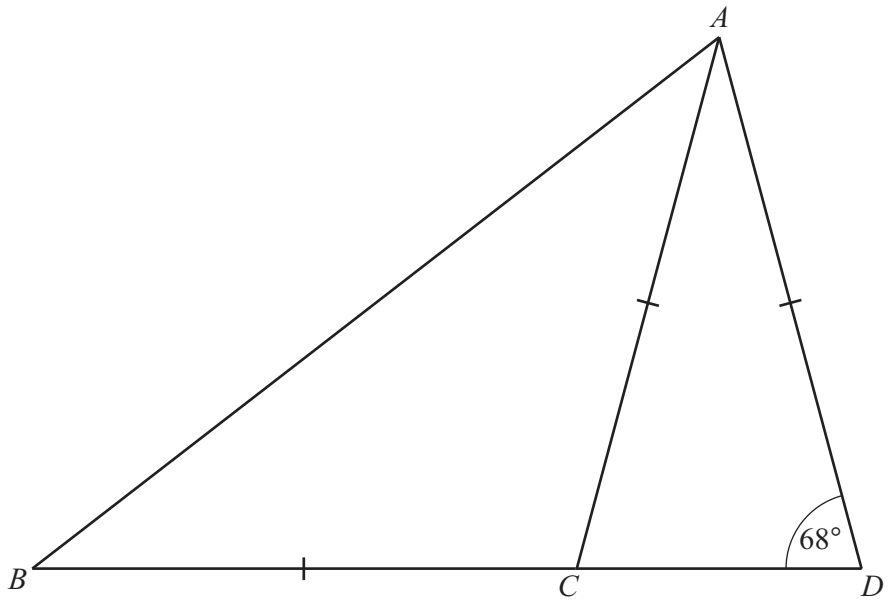
2 **(a)** Write 0.003 094 8 correct to 3 significant figures.

..... [1]

(b) Write 579 644 358 correct to the nearest million.

..... [1]

3



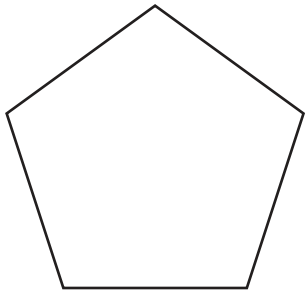
NOT TO SCALE

In the diagram $AC = BC = AD$.
BCD is a straight line.

Find angle BAC.

Angle $BAC =$ ..... [2]

4 **(a)**



Draw all the lines of symmetry of this regular pentagon. [1]

(b) A quadrilateral has rotational symmetry of order 2 and no lines of symmetry.

Write down the mathematical name of this quadrilateral.

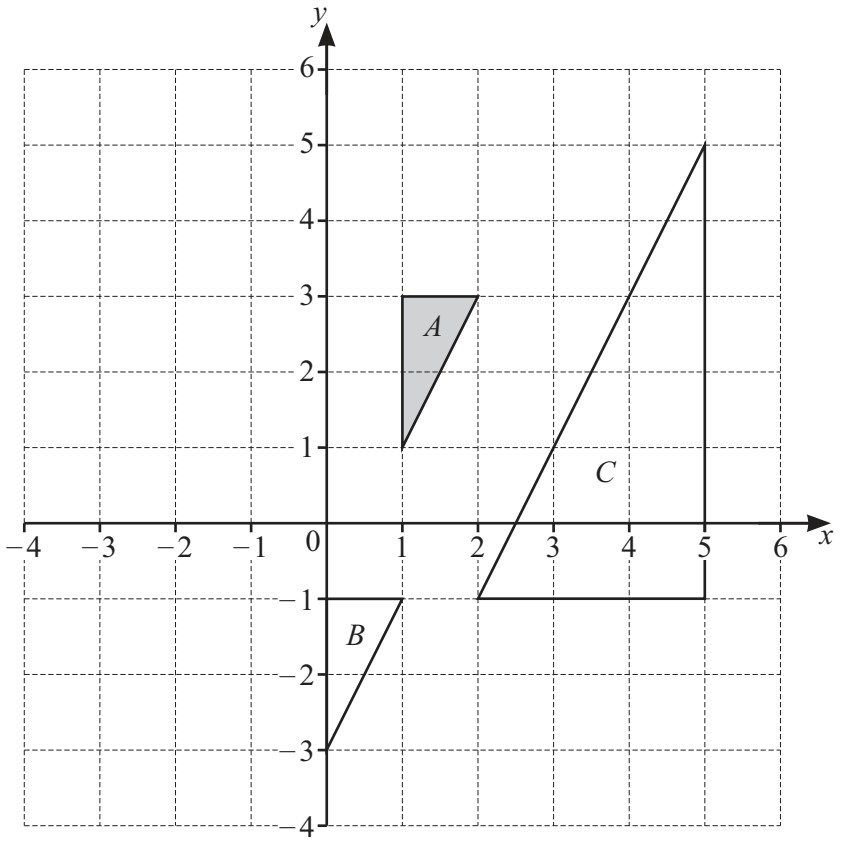
..... [1]

5 Work out $1\frac{3}{7} \times 4\frac{2}{3}$.

Give your answer as a mixed number in its simplest form.

..... [3]

6



(a) Describe fully the **single** transformation that maps triangle A onto triangle B.

.....

..... [2]

(b) Describe fully the **single** transformation that maps triangle A onto triangle C.

.....

..... [3]

(c) Rotate triangle A through 90° anticlockwise about $(-1, 1)$.

[2]

7 The ratio $a : b = 7 : 12$.
The ratio $b : c = 8 : 5$.

Find the ratio $a : b : c$ in its simplest form.

..... : ..... : ..... [2]

8 The mean of 9 numbers is 8.
When an extra number is included, the mean is 7.7 .

Find the extra number.

..... [2]

9 Factorise.

(a) $4x^2y^3 - 6xy^4$

..... [2]

(b) $18p^2 - 2$

..... [2]

10 Work out $4 \times 10^{18} + 3.2 \times 10^{17}$.

Give your answer in standard form.

..... [2]

11 Solve.

$$7-3x > 2x-8$$

..... [2]

12 $P = 2^3 \times 3^a \times 5^b \times 7$ $Q = 2 \times 3^5 \times 7^c$

The highest common factor (HCF) of P and Q is $2 \times 3^4 \times 7$.

The lowest common multiple (LCM) of P and Q is $2^3 \times 3^5 \times 5^2 \times 7$.

Find the values of a, b and c.

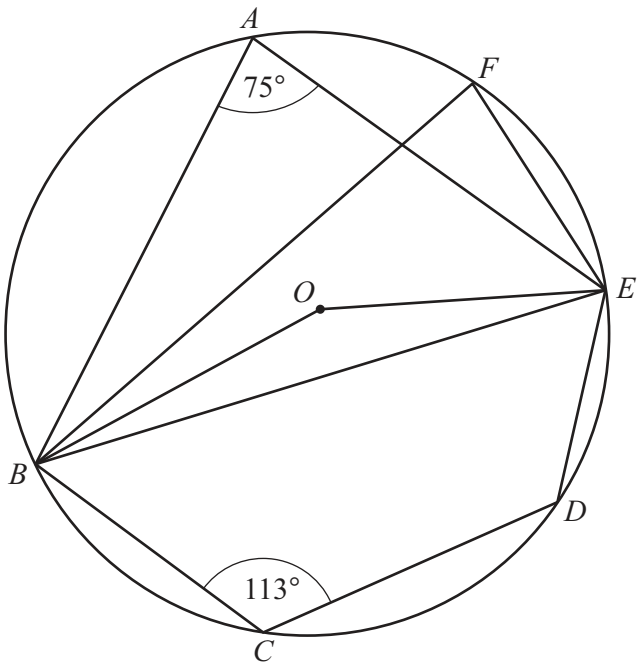
$a =$ .....

$b =$ .....

$c =$ .....

[3]

13



NOT TO SCALE

A, *B*, *C*, *D*, *E* and *F* are points on a circle, centre *O*.

(a) Find angle *BFE*.

Angle *BFE* = ... [1]

(b) Find angle *BED*.

Angle *BED* = ... [1]

(c) Find reflex angle *BOE*.
Give geometrical reasons for your answer.

Angle *BOE* = ... Reasons .....

.....

..... [3]

14 These are the first 5 terms of a sequence.

1 7 17 31 49

(a) Find the next term of the sequence.

..... [1]

(b) Find an expression for the nth term of the sequence.

..... [2]

15 Solve.

$$2x^2 - 5x - 3 = 0$$

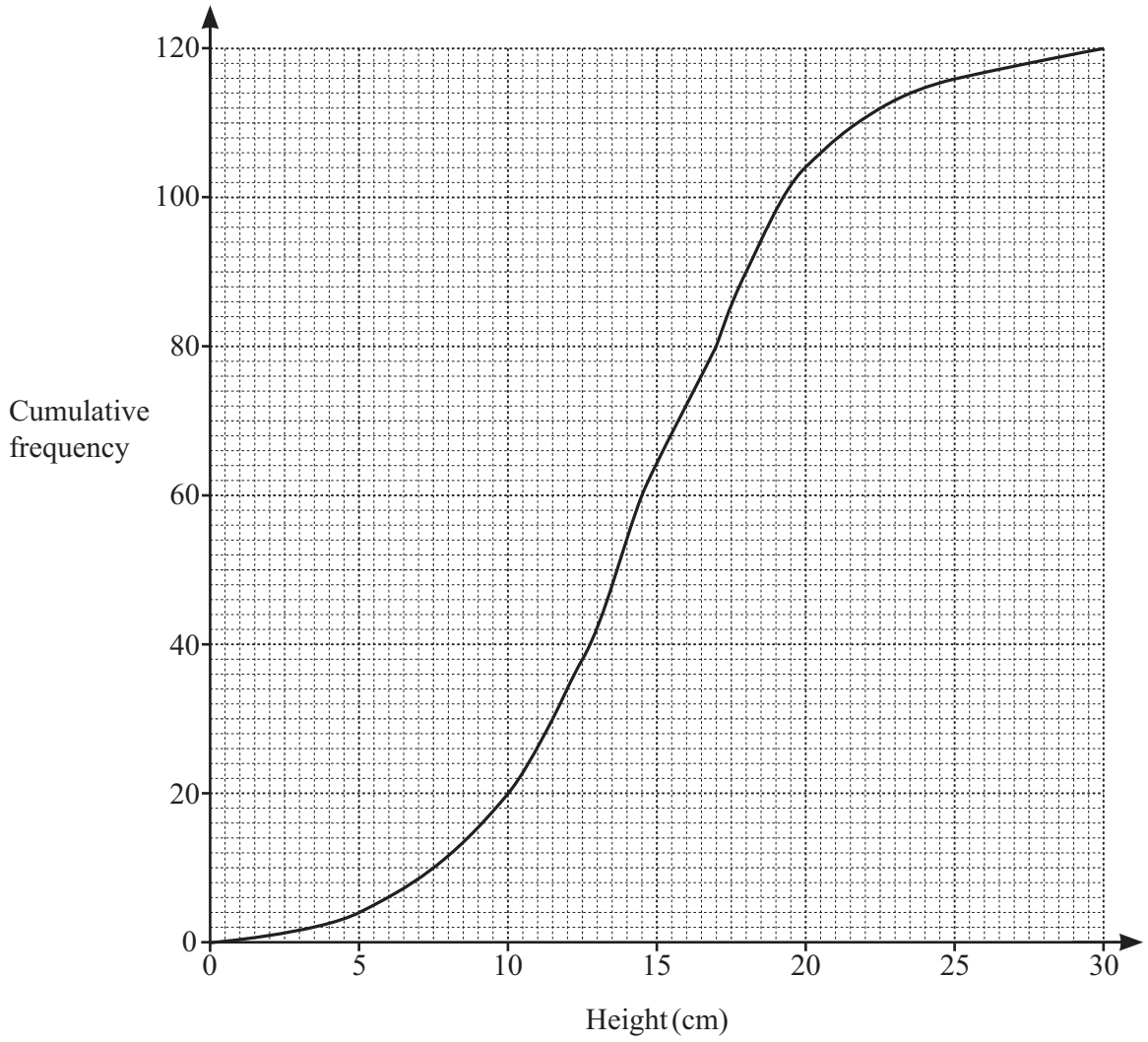
$x =$ ..... or $x =$ ..... [3]

16 A is the point $(-3, 2)$ and B is the point $(5, -8)$.

Find the equation of the perpendicular bisector of AB.

..... [5]

17 The cumulative frequency diagram shows the heights of 120 plants.



Use the cumulative frequency diagram to estimate

(a) the interquartile range

..... cm [2]

(b) the number of plants greater than 20 cm in height.

..... [2]

18 **(a)** $f(x) = 3x - 2$ $g(x) = 5 - x$

(i) Find $f(-4)$.

..... [1]

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

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

(iii) Solve $gf(x) = 1$.

..... [3]

(b) $h(x)$ is a function with an inverse function $h^{-1}(x)$.

Find $hh^{-1}(x)$.

..... [1]

19 Expand and simplify.

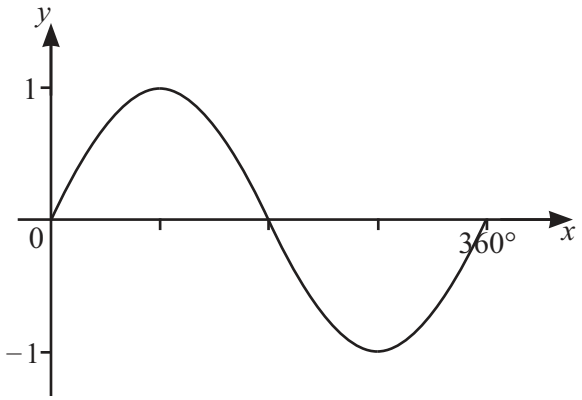
$(x-4)(2x+1)(x+2)$

..... [3]

20 **(a)** Solve $\tan x = \sqrt{3}$ for values of x between 0° and 360°.

..... [2]

(b) This is a sketch of the graph of $y = \sin x$.



Solve $4\sin x + 3 = 1$ for values of x between 0° and 360°.

..... [3]

21 y is inversely proportional to x^3.
$y = 1$ when $x = 2$.

(a) Find y in terms of x.

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

(b) Find x when $y = 27$.

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

22 Simplify.

(a) $\sqrt{120} \times \sqrt{27}$

..... [2]

(b) $\dfrac{1}{5 - 2\sqrt{3}}$

..... [2]

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