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**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.

## 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  $h$ .

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

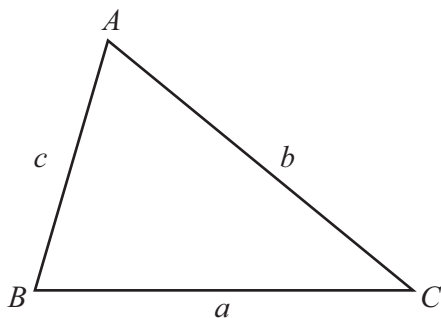
Volume,  $V$ , of sphere of radius  $r$ .

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

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

$\sqrt{125}$

125

81

$7\frac{2}{3}$

From this list write down

- (a) a cube number

..... [1]

- (b) an irrational number.

..... [1]

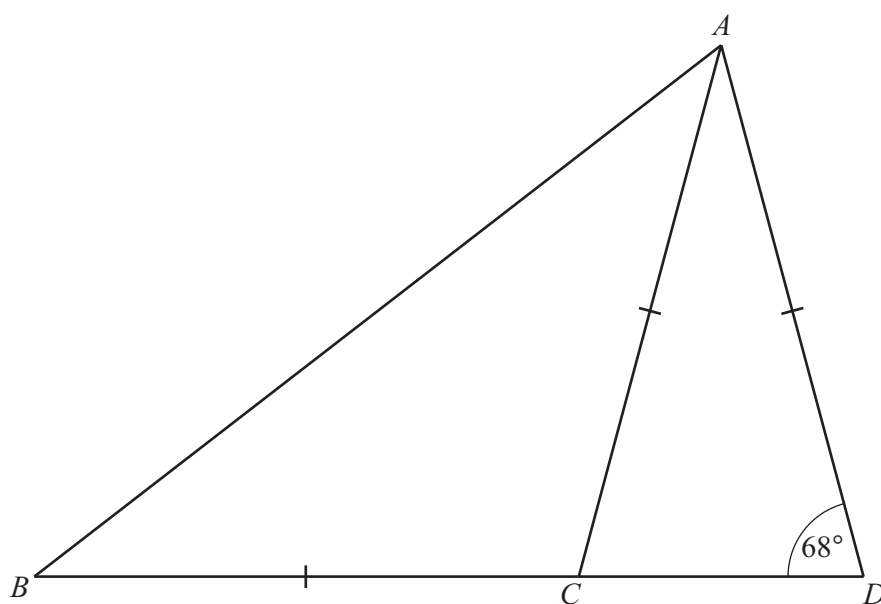
- 2 (a) Write 0.003 094 8 correct to 3 significant figures.

..... [1]

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

..... [1]

3



NOT TO  
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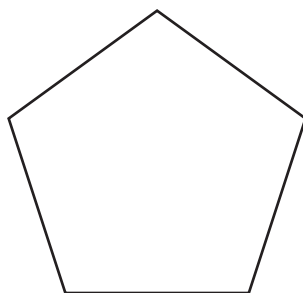
In the diagram  $AC = BC = AD$ .  
 $BCD$  is a straight line.

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.

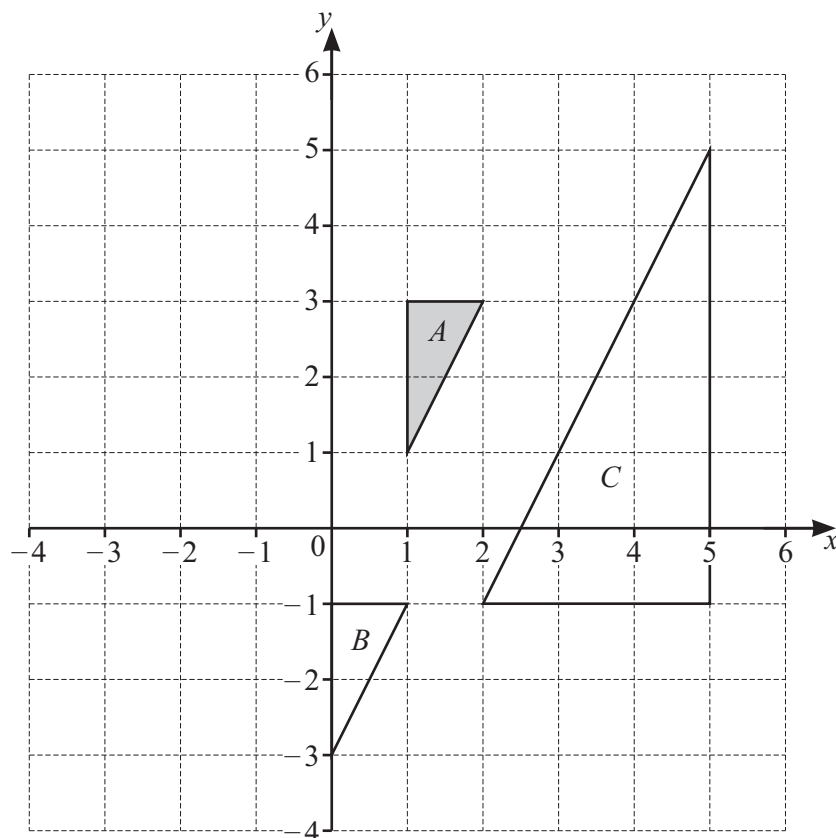
..... [1]

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

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

..... [3]





- (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  $90^\circ$  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  $c$ .

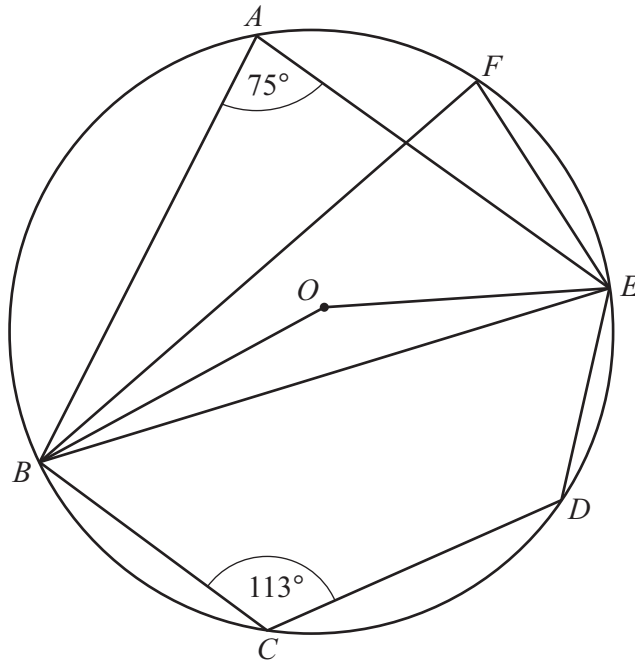
$$a = \dots\dots\dots$$

$$b = \dots\dots\dots$$

$$c = \dots\dots\dots$$

[3]





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

(a) Find angle  $BFE$ .

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

(b) Find angle  $BED$ .

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

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

Angle  $BOE = \dots\dots\dots$  Reasons  $\dots\dots\dots$

$\dots\dots\dots$

$\dots\dots\dots$  [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  $n$ th term of the sequence.

..... [2]

15 Solve.

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

$x = \dots\dots\dots$  or  $x = \dots\dots\dots$  [3]

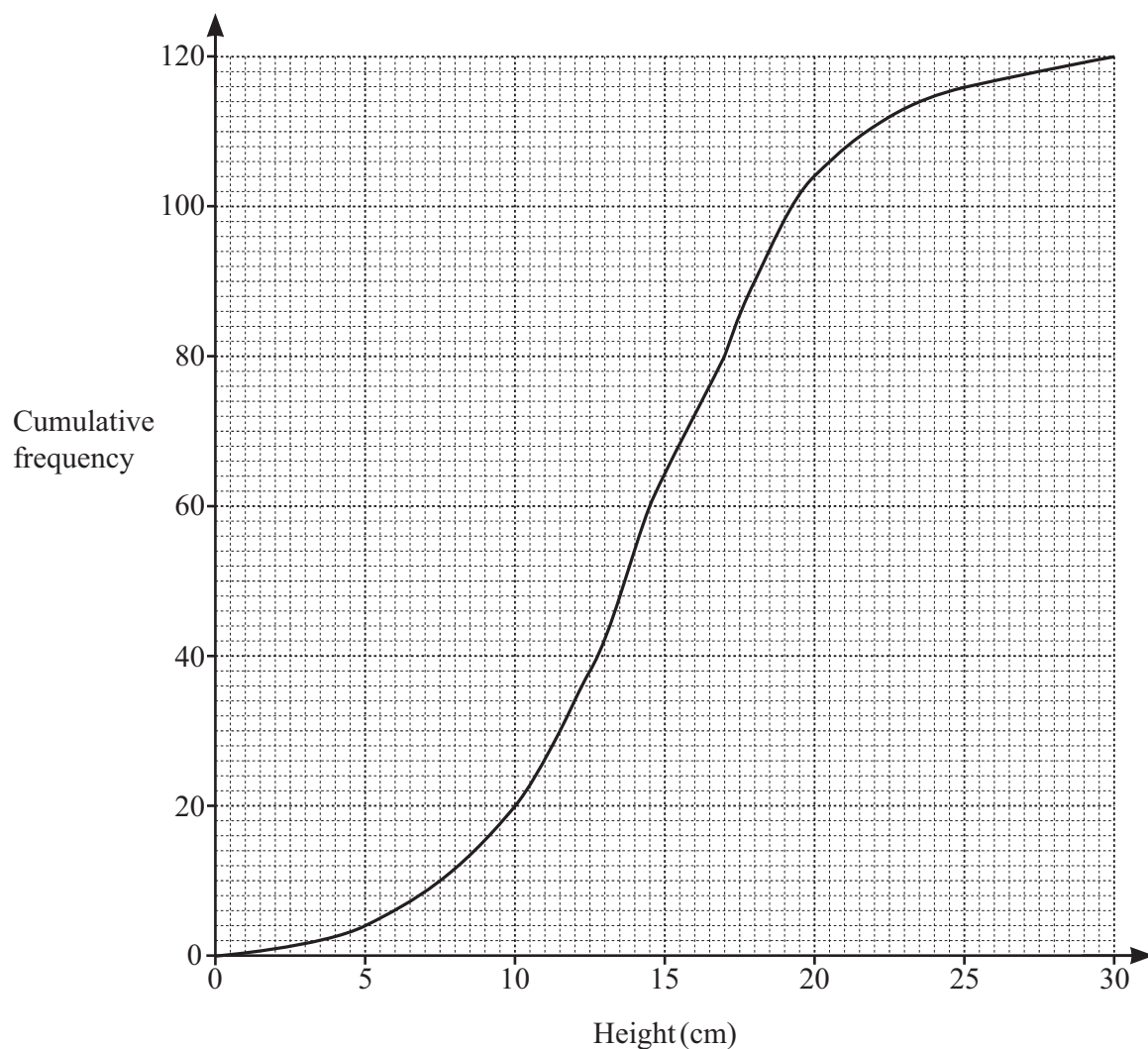
16  $A$  is the point  $(-3, 2)$  and  $B$  is the point  $(5, -8)$ .

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.

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

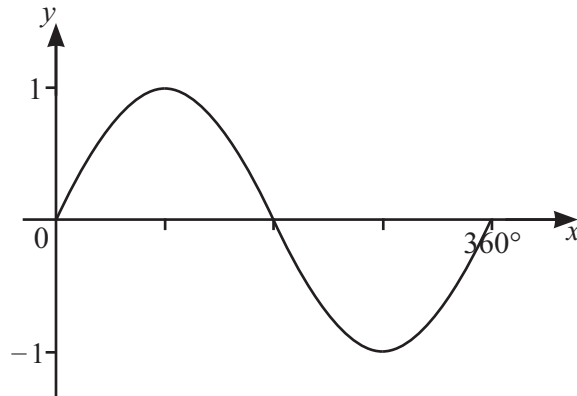
..... [3]



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

..... [2]

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



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

..... [3]





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

(a) Find  $y$  in terms of  $x$ .

$y = \dots\dots\dots$  [2]

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

$x = \dots\dots\dots$  [2]

- 22 Simplify.

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

$\dots\dots\dots$  [2]

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

$\dots\dots\dots$  [2]







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