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Cambridge O Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

MATHEMATICS (SYLLABUS A) **4021/01**

Paper 1 Non-calculator (Core) **October/November 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.

INFORMATION
- The total mark for this paper is 80.
- 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.	$V = \frac{4}{3}\pi r^3$

Calculators must **not** be used in this paper.

1 Write down the value of the 3 in the number 23 679.

.... [1]

2 Tom buys 2 books costing $8.20 each.

Work out how much change he receives from $20.

$ .... [2]

3 (a) Write 17 469 correct to the nearest ten.

.... [1]

(b) Write 5.073 correct to 1 decimal place.

.... [1]

4 (a) Write down the value of $\sqrt{144}$.

.... [1]

(b) Work out the value of 5^3.

.... [1]

5 The diagram is made from equilateral triangles.
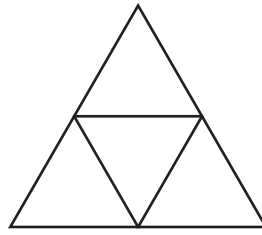
(a) On the diagram, draw all the lines of symmetry. [2]

(b) Write down the order of rotational symmetry.

.... [1]

6 **(a)** Write $\frac{3}{4}$ as a decimal.

.... [1]

(b) Write $\frac{9}{100}$ as a percentage.

....% [1]

(c) Write 143% as a decimal.

.... [1]

7 A bag contains 8 discs numbered 1 to 8.
A disc is picked at random from the bag.
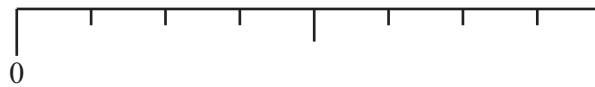
On the probability scale, draw an arrow ($\downarrow$) to show the probability that the number is

(a) an even number, label the arrow A [1]

(b) 9, label the arrow B [1]

(c) less than 3, label the arrow C. [1]

8   A number, *n*, is a factor of 144 and a multiple of 9.

Find all the values for *n*.

.... [3]

9   The temperature at midday on Monday is –3 °C.
The temperature at 10 pm on Monday is –15 °C.

(a) Calculate the difference between these two temperatures.

.... °C [1]

(b) The temperature at midday on Tuesday is 23 °C higher than the temperature at 10 pm on Monday.

Calculate the temperature at midday on Tuesday.

.... °C [1]

10 A bag contains red balls and green balls.
They are in the ratio   red balls : green balls = 2 : 3.
A ball is picked at random.

Find the probability that it is a red ball.

.... [1]

11 The stem-and-leaf diagram shows the number of customers entering a shop each day for 20 days.

3	0 1 5 9
4	1 4 6 8 9
5	1 3 4 4 4 7 8
6	3 6 6
7	2

Key : 3 | 0 represents 30 customers

(a) Find the range.

.... [1]

(b) Find the mode.

.... [1]

(c) Work out the percentage of these 20 days when more than 55 customers enter the shop.

....% [2]

(d) (i) Find the median.

.... [1]

(ii) On the next day 48 customers enter the shop.

Will the median increase or decrease?
Give a reason for your answer.

.... because ....

.... [1]

12 The diagram shows a parallelogram.

$(3x+10)°$

$(x-30)°$
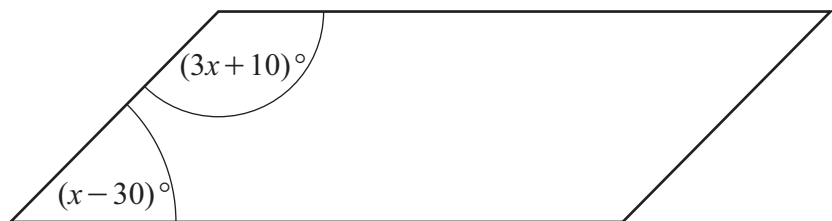
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(a) Use the information in the diagram to write an equation and solve it to find the value of x.

$x =$ .... [4]

(b) Find the value of the largest angle in this parallelogram.

.... [1]

13

5 cm

3 cm

4 cm

4 cm
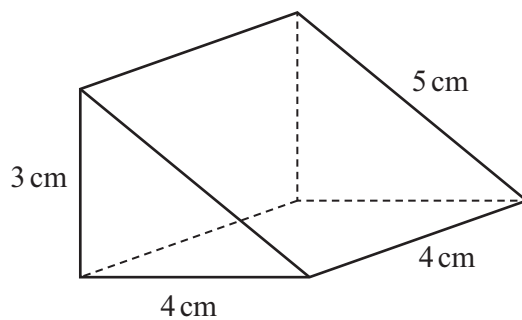
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The diagram shows a right-angled triangular prism.

Complete the net of this prism on the 1 cm² grid.
One face has been drawn for you.
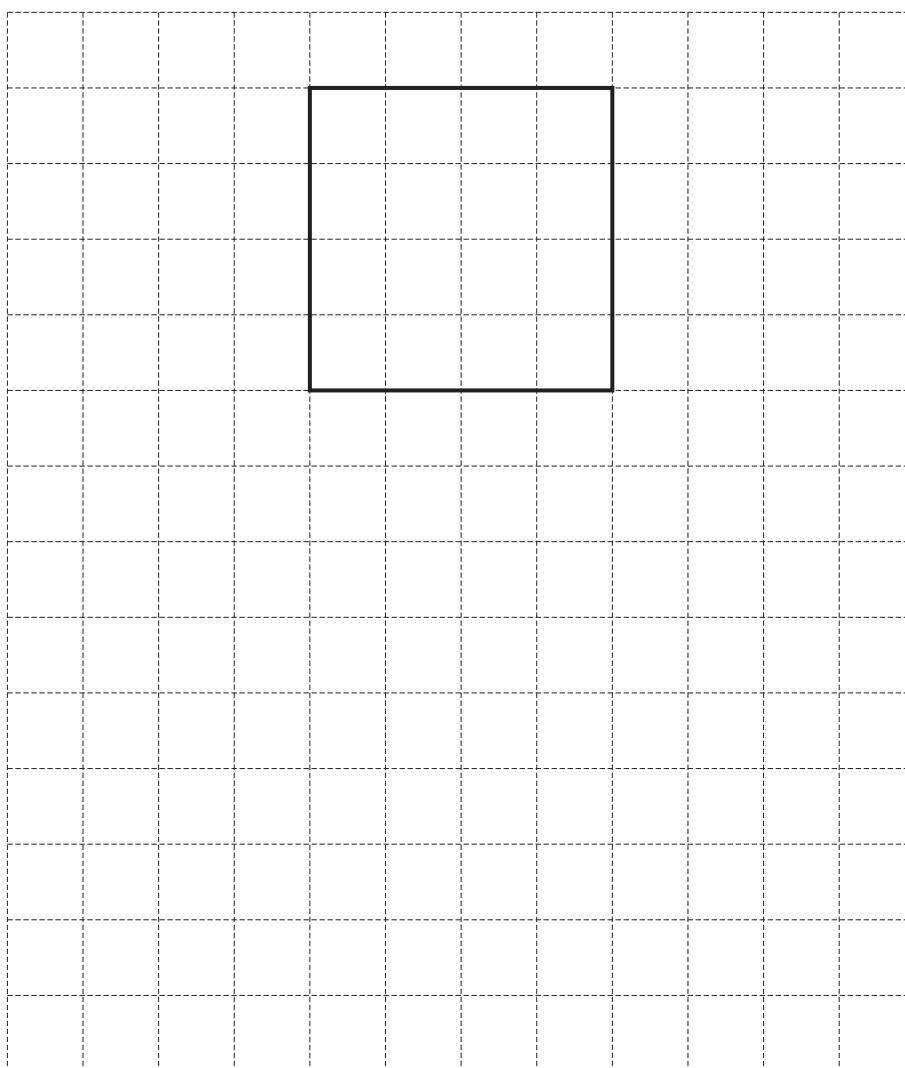
[3]

14 The diagram shows a smaller triangle *DEF* which has vertices on the sides of a larger triangle *ABC*.
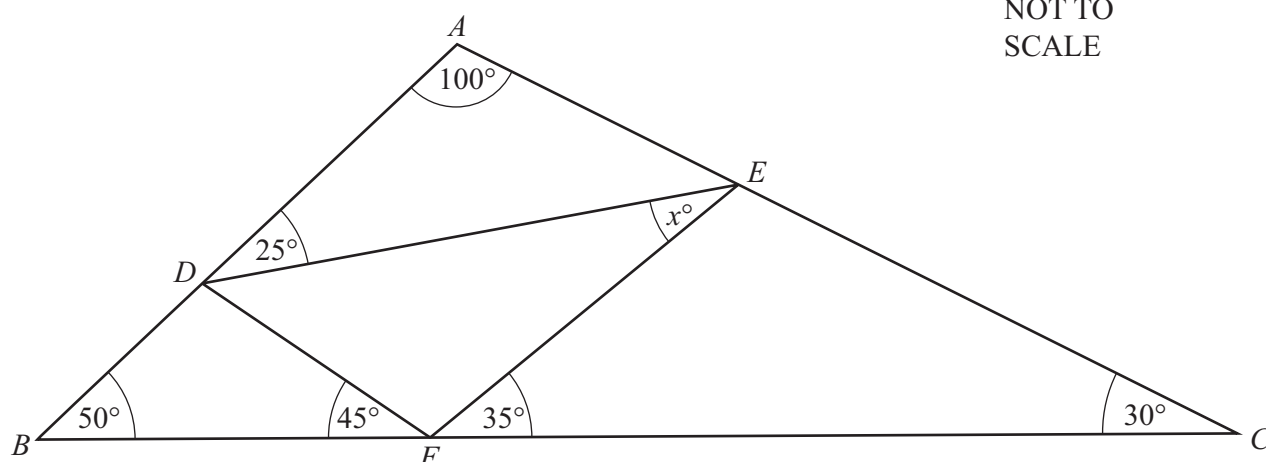
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Find the value of *x*.

x = ... [3]

15 Three sisters share $*n* in the ratio $10:3:2$.
The smallest share is $120.

Find the value of *n*.

n = ... [3]

16 9.857×10^{-2} 3.5×10^{2} 1.54×10^{1} 6.5×10^{-2}

Write these numbers in order, starting with the smallest.

.... < .... < .... < .... [2]
smallest

17

8 cm

6 cm

14 cm
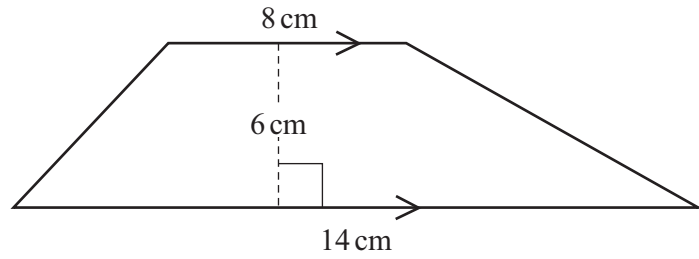
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Calculate the area of this trapezium.

....cm^2 [2]

18 Work out.

$$2\frac{5}{6} \div 4\frac{1}{4}$$

Write your answer as a fraction in its simplest form.

.... [3]

19 The grid shows two flags, *F* and *A*.
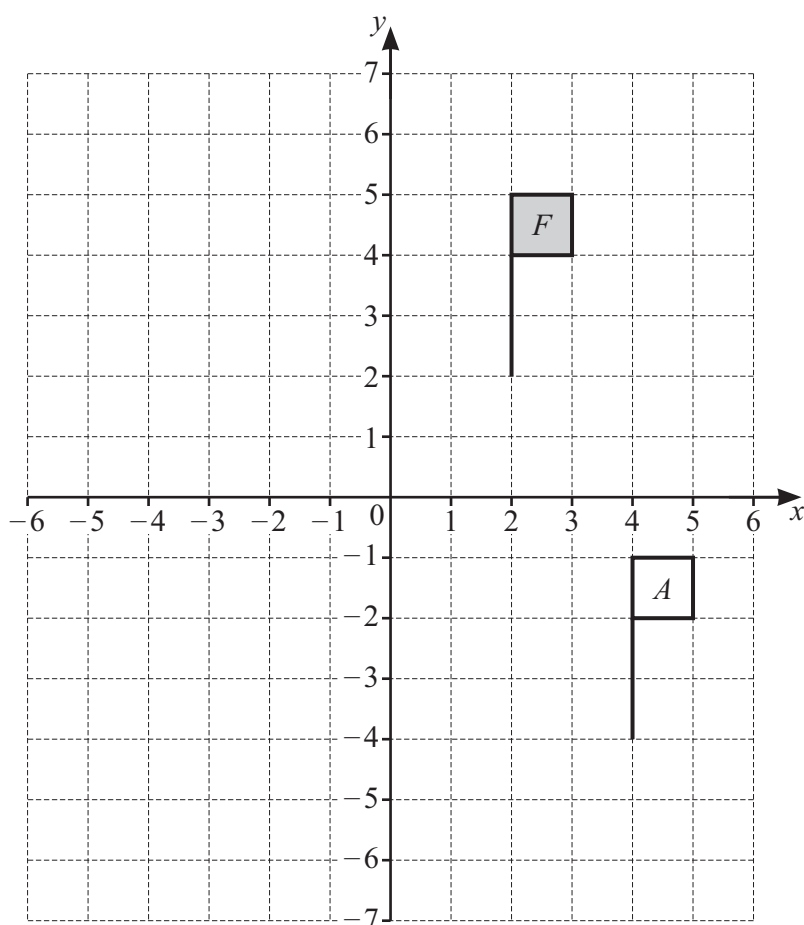
(a) On the grid, draw the image of flag *F* after a reflection in the line $x = -1$. [2]

(b) On the grid, draw the image of flag *F* after a rotation of 180° about (0, 0). [2]

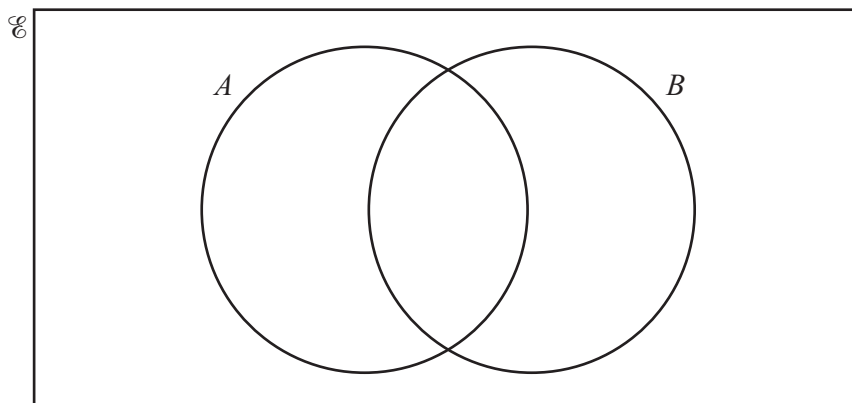**(c)** Describe fully the **single** transformation that maps flag *F* onto flag *A*.

....

.... [2]

20 $\mathscr{E} = \{1,2,3,4,5,6,7,8,9,10\}$
         $A = \{1,3,5,7,9\}$
         $B = \{1,3,6,10\}$

(a) Use this information to complete the Venn diagram.   [2]

(b) List the elements of $A \cap B$.

.... [1]

(c) Find $\text{n}(B')$.

.... [1]

21   Simplify.

$$\frac{18x^8}{9x^2}$$

.... [2]

22   Work out the size of one interior angle of a regular hexagon.

.... [2]

23 There are two charges for crossing a bridge.

Cars $a

Other vehicles $b

On Monday 4 cars and 20 other vehicles pay a total of $130.
On Tuesday 6 cars and 15 other vehicles pay a total of $105.

Write down two equations and solve them to find the value of a and the value of b.
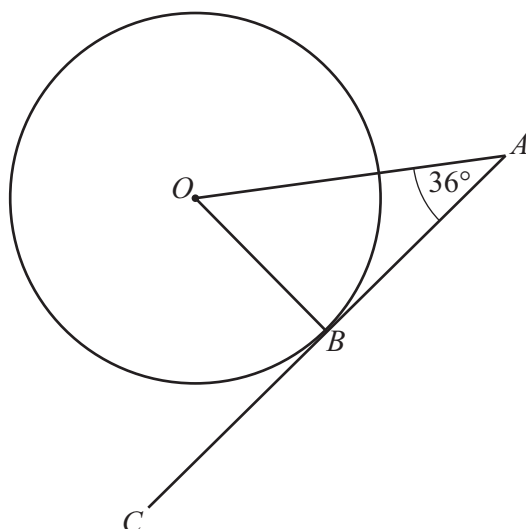
$a =$ ....

$b =$ ....

[6]

[Turn over

DFD

24

NOT TO
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36°

B is a point on the circle, centre *O*.
ABC is a tangent to the circle at *B* and angle *OAB* = 36°.

Work out the size of angle *AOB*.

Angle *AOB* = ... [1]

25 (a) Expand and simplify.

$$(x-5)(x+2)$$

.... [2]

(b) Factorise.

$$5x^3 + 10x$$

.... [2]

26 The length, *l* metres, of a rope is 16.32 metres, correct to 2 decimal places.

Complete this statement about the value of *l*.

.... $\leqslant l <$ .... [2]

27 (a) These are the first four terms of a sequence.

$$2 \qquad 8 \qquad 14 \qquad 20$$

Find the *n*th term of this sequence.

.... [2]

(b) The *n*th term of a different sequence is $n^2 + 10$.

Find the first three terms of this sequence.

.... , ... , ... [2]

DFD

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