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MATHEMATICS **0580/21**

Paper 2 Non-calculator (Extended) **May/June 2026**

2 hours

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. Do **not** use correction fluid or tape.
- 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 100.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages.

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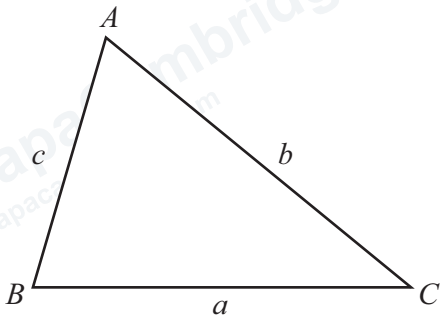
[Turn over

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,



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

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

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

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

1 Write down the value of 143^0.

..... [1]

2 Solve $7x + 4 = 25$.

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

3 Find the value of $4x^2 + 3y$ when $x = 5$ and $y = 10$.

..... [2]

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NOT TO SCALE

The diagram shows a rectangle with width 6 cm.

The width of the rectangle is $\frac{1}{12}$ of the perimeter of the rectangle.

Work out the length of the rectangle.

..... cm [2]

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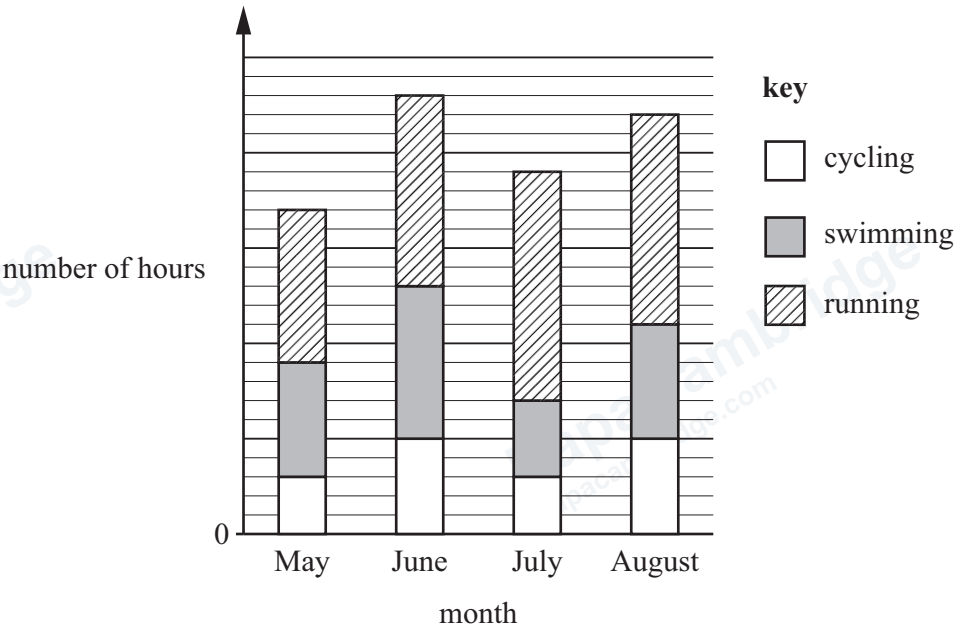
5 For four months, Hannah records the amount of time that she spends swimming, running and cycling.

The composite bar chart shows this information.



(a) Complete the statement with the correct month.

Hannah spends more time running in ..... than in any of the other months. [1]

(b) In May, Hannah spends 9 more hours swimming than she spends cycling.

Find the number of hours Hannah spends swimming in July.

..... hours [2]

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6 Solve the simultaneous equations.

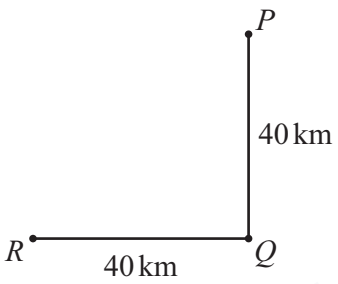
$$2x - y = 3$$
$$x + y = 12$$

$x =$ .....

$y =$ .....

[2]

7



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The diagram shows the positions of three ships P, Q and R.
Ship Q is 40 km due east of ship R.
Ship P is 40 km due north of ship Q.

Work out the bearing of ship R from ship P.

..... [2]

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8 P is the point (0, 4) and Q is the point (1, 8).

(a) Find the coordinates of the midpoint of PQ.

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

(b) Find the vector $\overrightarrow{QP}$.

$\overrightarrow{QP} = \begin{pmatrix} \\ \end{pmatrix}$ [2]

(c) The graph of $y = x^2 + ax + b$ passes through the points P and Q.
This graph also passes through the point $(-2, c)$.

Find the value of c.

$c =$ ..... [4]

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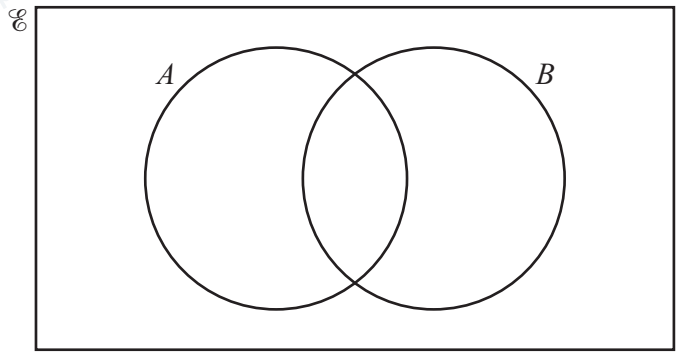
9 In this Venn diagram, shade the region $A' \cup B$.



[1]

10 (a) $24\,192 = 2^7 \times 3^3 \times 7$

$245\,000 = 2^3 \times 5^4 \times 7^2$

Find the highest common factor (HCF) of 24 192 and 245 000.

..... [1]

(b) A number, k, is written as a product of its prime factors.

$k = 2^3 \times 3^4 \times 5 \times c^2$

where c is a prime number greater than 5.

Write the number $20k^2$ as a product of its prime factors.
Give your answer in terms of c in its simplest form.

..... [2]

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11 **(a)** A, B and C are linear sequences.
The table gives some information about these sequences.

sequence	1st term	2nd term	3rd term	4th term	nth term
A	3				
B	-4				$B_n = n-5$
C	-1	2	5	8	

For these sequences, $C_n = A_n + B_n$.

Work out A_n, the nth term of sequence A.

$A_n =$ ..... [3]

(b) These are the first five terms of another sequence.

$\frac{1}{2}$ 1 2 4 8

(i) Find the next term in this sequence.

..... [1]

(ii) Find the nth term of this sequence.

..... [2]

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12 The coordinates of A are (3, 20).
The coordinates of B are (5, 10).

Work out the gradient of AB.

..... [2]

13 **(a)** Work out.

$0.9\dot{2}\dot{4} - 0.213$

Give your answer as a decimal correct to 5 decimal places.

..... [2]

(b) Write $0.6\dot{7}$ as a fraction.

..... [2]

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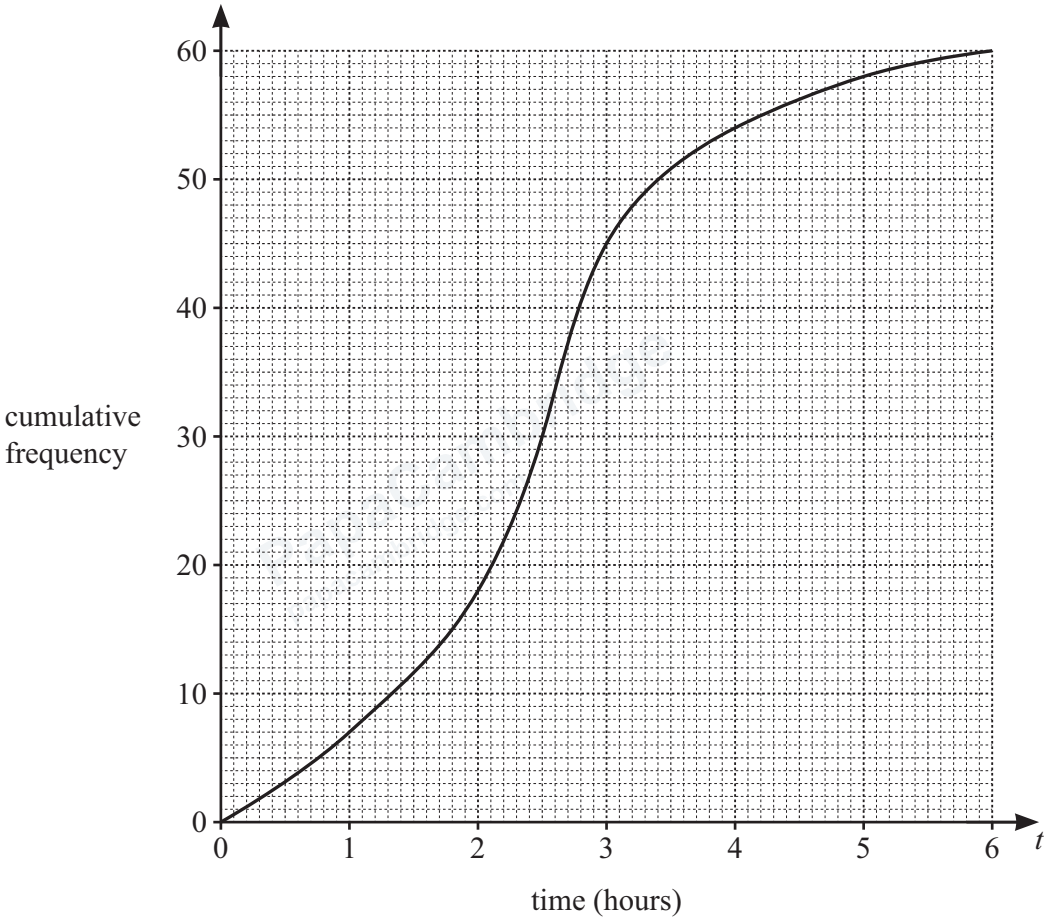
14 The cumulative frequency diagram shows information about the amount of time 60 students spend watching television on one day.



(a) Find an estimate for

(i) the median

..... hours [1]

(ii) the interquartile range.

..... hours [2]

(b) Use the cumulative frequency diagram to complete this frequency table.

time spent watching television (t hours)	$0 < t \leqslant 1$	$1 < t \leqslant 2$	$2 < t \leqslant 3$	$3 < t \leqslant 4$	$4 < t \leqslant 5$	$5 < t \leqslant 6$
frequency	7			9	4	2

[2]

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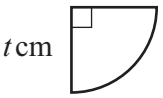
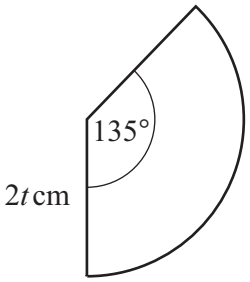
shape A



shape B



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Shape A is one quarter of a circle with radius t cm.
Shape B is a sector of a circle with radius $2t$ cm and sector angle 135°.
The area of shape B is k times the area of shape A.

Work out the value of k.

$k =$ ..... [4]

16 Expand and simplify $(3x + a)(x + 4a)$.

..... [2]

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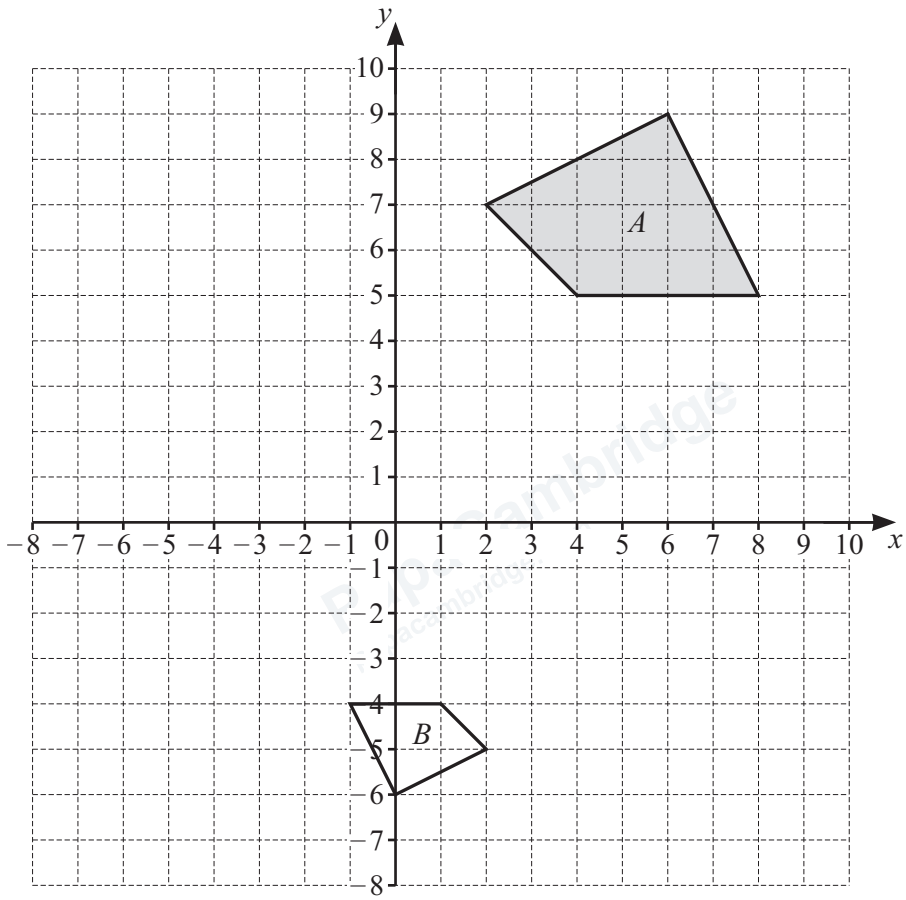
17 The diagram shows shape A and shape B drawn on a grid.



(a) On the grid, draw the image of shape A after a reflection in the line $x = 1$. [2]

(b) Describe fully the **single** transformation that maps shape A onto shape B.

.....

..... [3]

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18 $y = \sin 60° \times \tan 30°$.

Find the value of y.

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

19 $710\,000.03 = (7.1 \times 10^{a}) + (3 \times 10^{b})$

Find the value of a and the value of b.

$a =$ .....

$b =$ .....
[2]

20 Find the value of $27^{-\frac{2}{3}} \times (6^{4})^{0.5}$.

..... [4]

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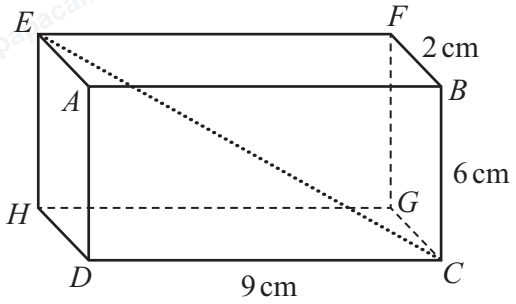

NOT TO SCALE

The diagram shows a solid cuboid $ABCDEFGH$.
$BF = 2$ cm, $BC = 6$ cm and $CD = 9$ cm.

(a) Calculate the volume of the cuboid.

..... cm^3 [1]

(b) Calculate the surface area of the cuboid.

..... cm^2 [3]

(c) Calculate CE.

$CE =$ ..... cm [3]

(d) The angle between CE and the base $CDHG$ is $x°$.

Find the value of $\sin x°$.

..... [2]

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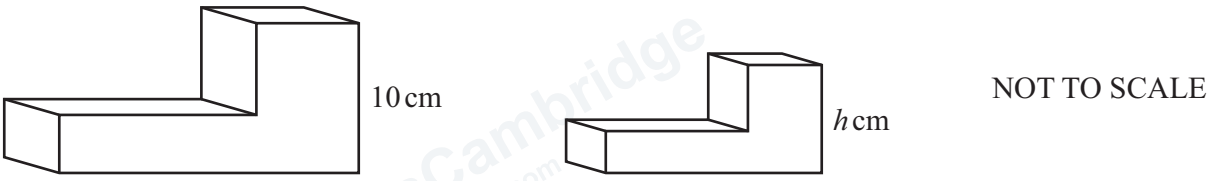
22 The table shows some information about the lengths of 145 pieces of wire.

length (L cm)	$70 < L \leqslant 90$	$90 < L \leqslant 100$	$100 < L \leqslant 115$	$115 < L \leqslant 120$
frequency	40	35	45	25
height of bar in histogram (cm)	4			

Stanley wants to draw a histogram to represent the information.

Complete the table. [3]

23



The two solids are mathematically similar.
The volume of the larger solid is $64\,\text{cm}^3$ and the volume of the smaller solid is $27\,\text{cm}^3$.
The height of the larger solid is 10 cm and the height of the smaller solid is h cm.

Find the value of h.

$h =$ ..... [3]

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24 **(a)** Find the coordinates of the turning points of the graph of $y = x^3 - 6x^2 + 7$.

(..... , ...)

(..... , ...)

[6]

(b) By drawing a suitable sketch, determine whether each turning point is a maximum or a minimum.

[3]

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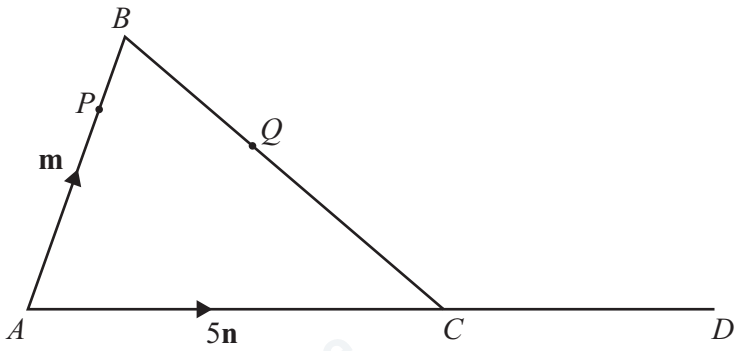

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The diagram shows triangle ABC and straight line ACD.
P lies on AB and $AP : PB = 4 : 1$.

Q lies on BC and $BQ = \frac{2}{5}BC$.

$\overrightarrow{AB} = \mathbf{m}$ and $\overrightarrow{AC} = 5\mathbf{n}$.

(a) In each part, give your answer in terms of **m** and **n** in its simplest form.

(i) Find $\overrightarrow{BC}$.

$\overrightarrow{BC} =$ ..... [1]

(ii) Find $\overrightarrow{PQ}$.

$\overrightarrow{PQ} =$ ..... [3]

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(b) $\overrightarrow{CD} = 3\mathbf{n}$

Show that P, Q and D lie on a straight line.

[3]

Question 26 is on the back page.

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26 **(a)** Expand and simplify.

$$(5+\sqrt{2})(3-\sqrt{8})$$

..... [3]

(b) $\sqrt{2\frac{9}{20}}+\frac{6}{\sqrt{5}}=k\sqrt{5}$

Find the value of k.

$k =$ ..... [4]

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