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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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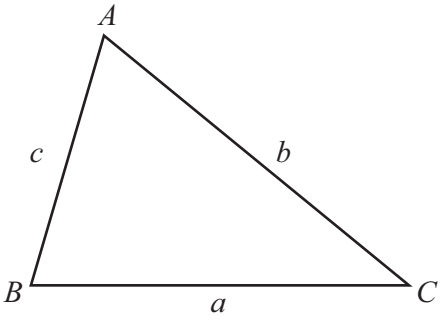
List of formulas

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.

View solution

..... [1]

2 Solve $7x + 4 = 25$.

View solution

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

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

View solution

..... [2]

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4

View solution



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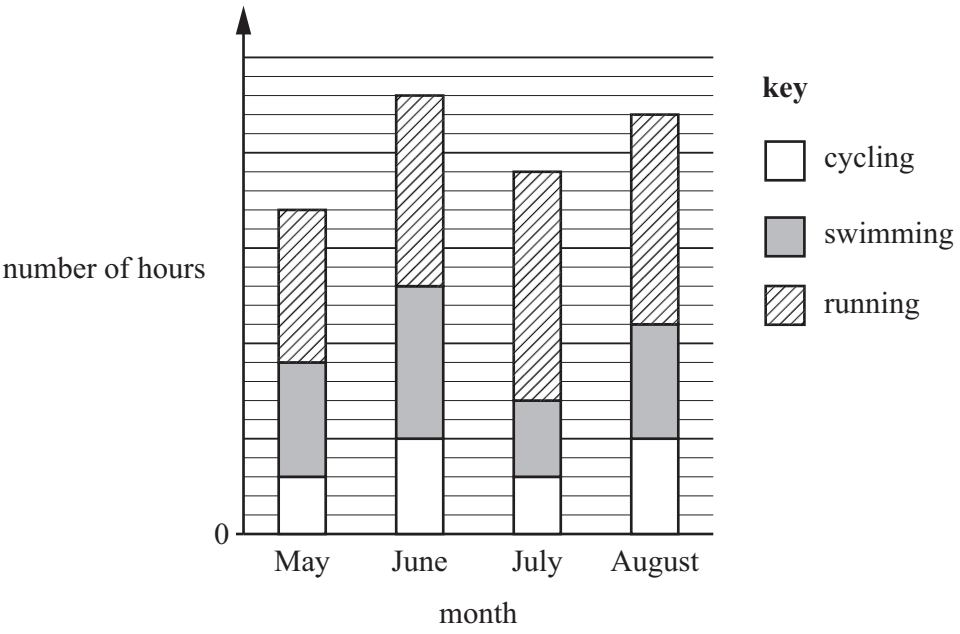
5 For four months, Hannah records the amount of time that she spends swimming, running and cycling.

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.

View solution

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

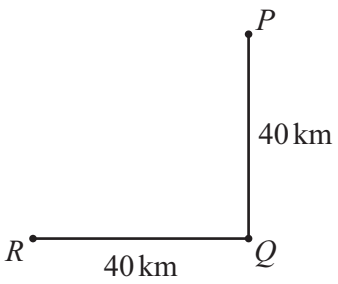
$x =$ .....

$y =$ .....

[2]

7

View solution



NOT TO SCALE

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.

View solution

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

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

View solution

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

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

View solution

Find the value of c.

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

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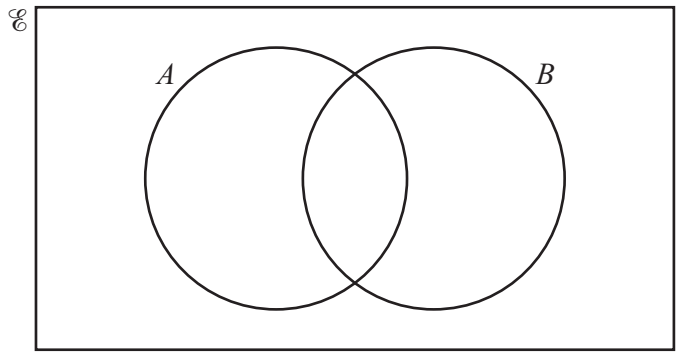
9 In this Venn diagram, shade the region $A' \cup B$.

View solution



[1]

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

View solution

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

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.

View solution

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

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, $C_n = A_n + B_n$.

View solution

Work out A_n, the nth term of sequence A.

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

View solution

(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.

View solution

..... [2]

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

View solution

Work out the gradient of AB.

..... [2]

13 **(a)** Work out.

View solution

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

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

..... [2]

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

View solution

..... [2]

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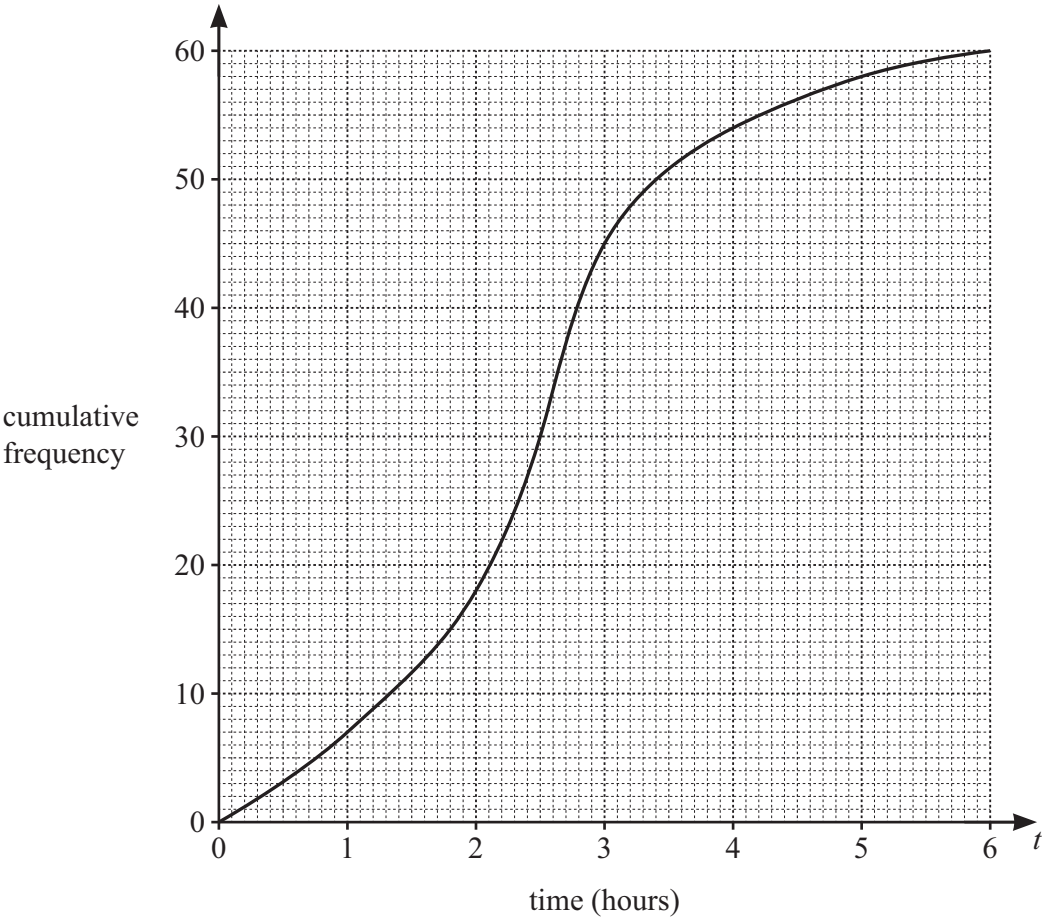
14 The cumulative frequency diagram shows information about the amount of time 60 students spend watching television on one day.



(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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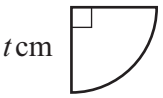
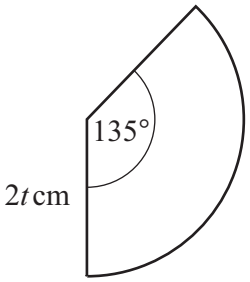
15

View solution

shape A



shape B



NOT TO SCALE

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 $(3x + a)(x + 4a)$.

View solution

..... [2]

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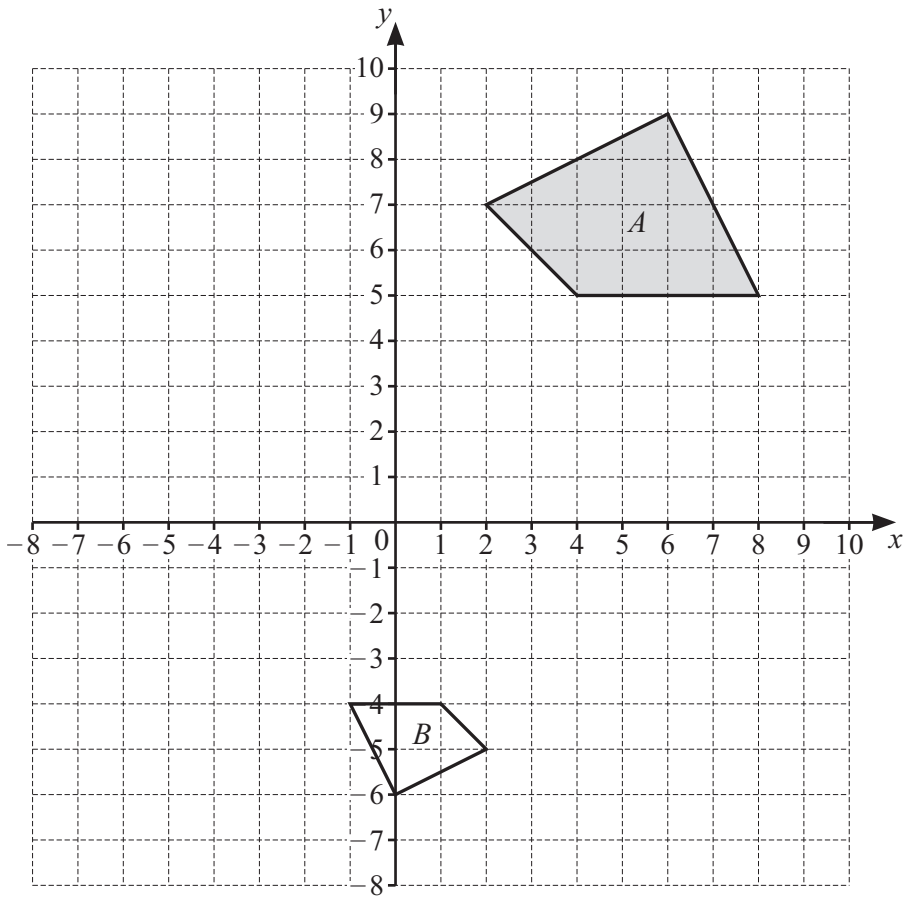
17 The diagram shows shape A and shape B drawn on a grid.



View solution

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

View solution

(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.

View solution

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

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

View solution

Find the value of a and the value of b.

$a =$ .....

$b =$ .....

[2]

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

View solution

..... [4]

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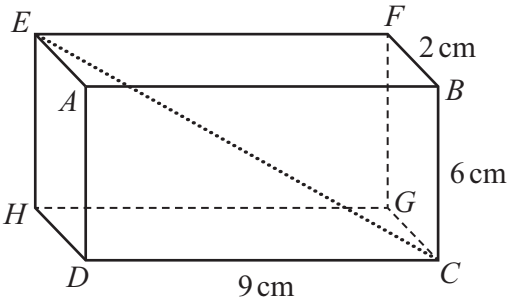
21



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.

View solution

..... cm^3 [1]

(b) Calculate the surface area of the cuboid.

View solution

..... cm^2 [3]

(c) Calculate CE.

View solution

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

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

View solution

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.

View solution

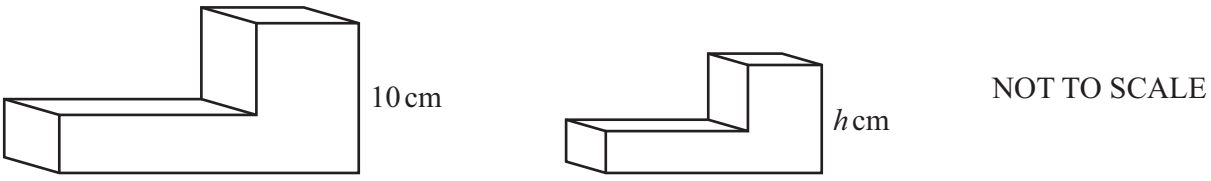
length (L cm)	$70 < L \leqslant 90$	$90 < L \leqslant 100$	$100 < L \leqslant 115$	$115 < L \leqslant 120$
frequency	40	35	45	25
height of bar in histogram (cm)	4			

Stanley wants to draw a histogram to represent the information.

Complete the table. [3]

23

View solution



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 $y = x^3 - 6x^2 + 7$.

View solution

(..... , ...)

(..... , ...)

[6]

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

View solution

[3]

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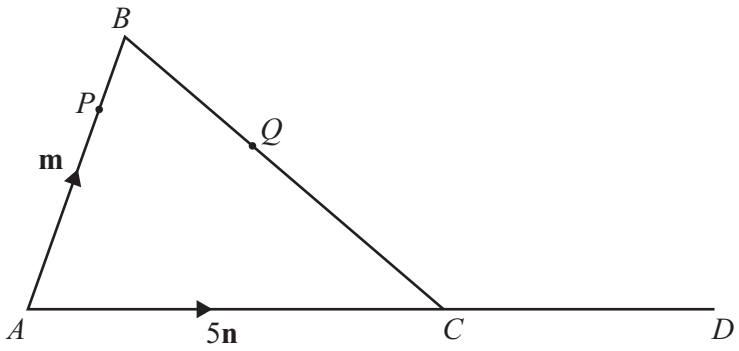
25



NOT TO SCALE

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.

View solution

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

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

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

View solution

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

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

View solution

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.

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

View solution

..... [3]

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

View solution

Find the value of k.

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

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