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# Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

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*5708701121*

**MATHEMATICS** **0580/22**

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 **16** pages.

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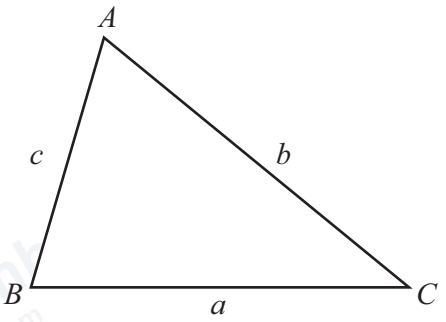
**[Turn over**

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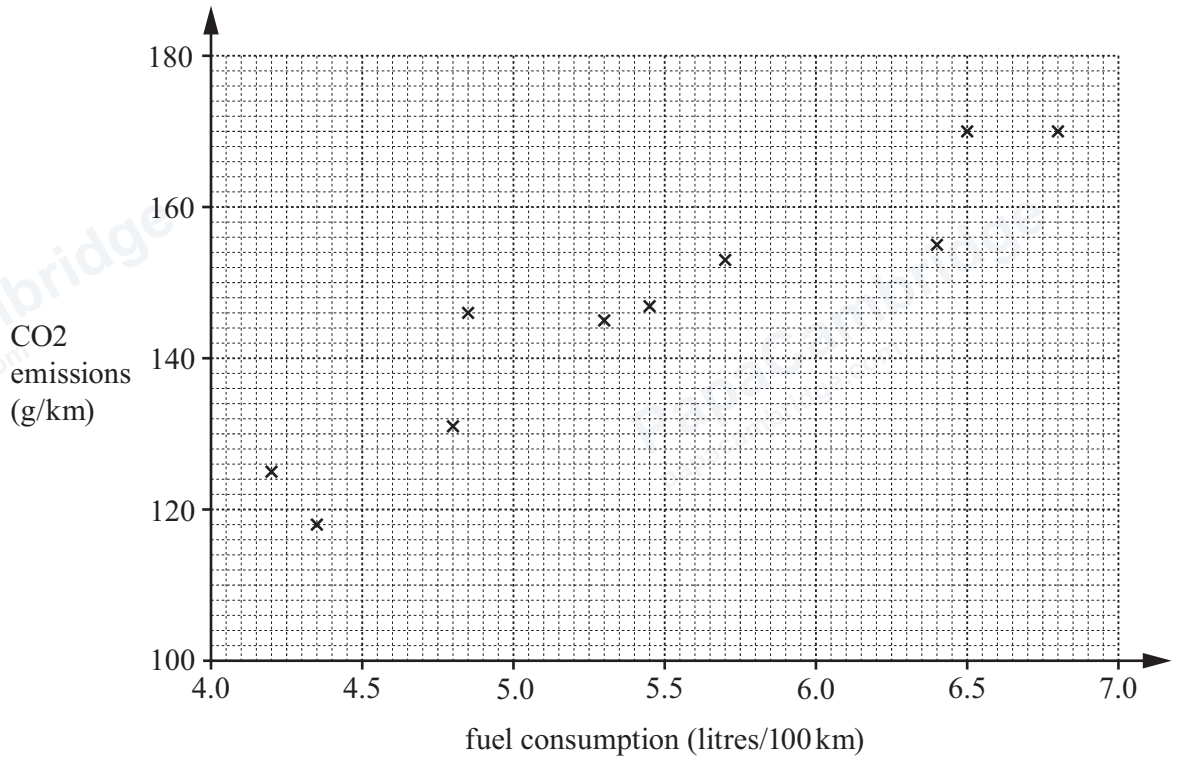
Calculators must **not** be used in this paper.

**1** The scatter diagram shows the fuel consumption and CO2 emissions for 10 cars.




**(a)** Another car has a fuel consumption of 6.2 litres/100 km and CO2 emissions of 162 g/km.

Plot a point on the scatter diagram to show this information. [1]

**(b)** What type of correlation does the scatter diagram show?

..... [1]

**(c)** Draw a line of best fit on the scatter diagram. [1]

**(d)** Paulo's car has CO2 emissions of 140 g/km.

Use your line of best fit to estimate the fuel consumption of his car.

..... litres/100 km [1]

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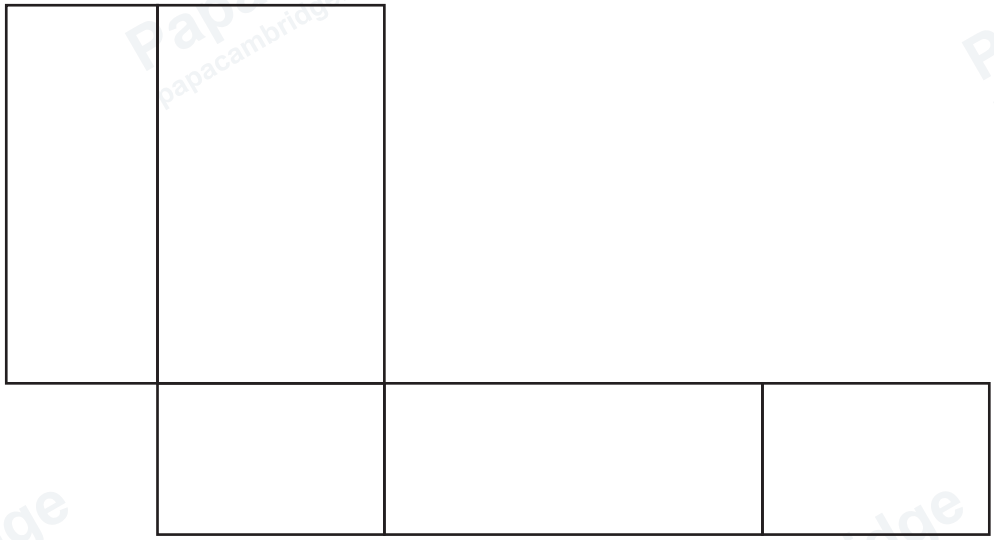
**2** The diagram shows an **accurate** net of an open box in the shape of a cuboid.
All the dimensions are whole numbers of centimetres.



**(a)** Find the total area of the net.

..... $cm^2$ [3]

**(b)** Find the volume of the open box.

..... $cm^3$ [2]

**3** Find the reciprocal of $3\frac{1}{3}$.

Give your answer as a fraction in its simplest form.

..... [2]

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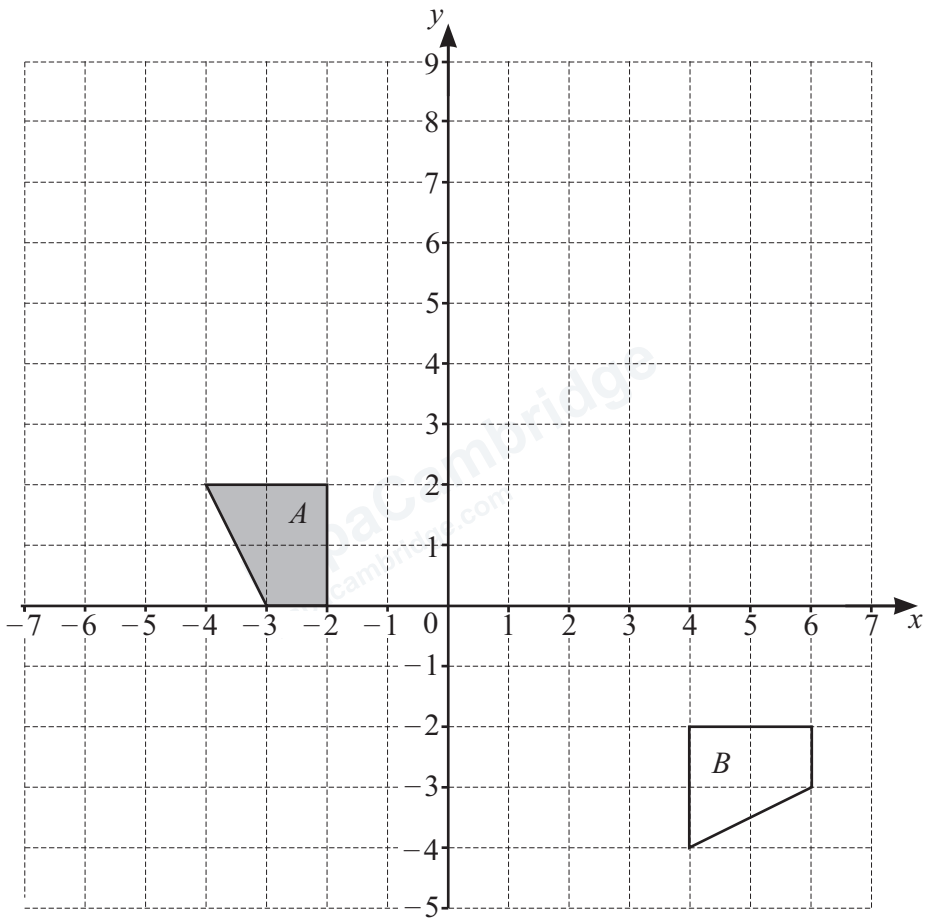
**4** Work out $\frac{1}{6} \div \frac{2}{7}$.

..... [2]

**5**




**(a)** On the grid, draw the image of

**(i)** shape $A$ after a translation by the vector $\begin{pmatrix} -2 \\ 5 \end{pmatrix}$ [2]

**(ii)** shape $A$ after a reflection in the line $y = x$. [2]

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

.....

..... [3]

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**6** $E = 5c^2 - d^2$

**(a)** Find the value of $E$ when $c = \sqrt{18}$ and $d = 2$.

$E =$ ..... [2]

**(b)** Rearrange the formula to write $c$ in terms of $E$ and $d$.

$c =$ ..... [3]

**7** Factorise.

$6wx - 4xy$

..... [2]

**8**

| | | | | |
|---|---|---|---|---|
| $\frac{1}{\sqrt{3}}$ | $\frac{1}{2}$ | $\frac{1}{\sqrt{2}}$ | $\sqrt{3}$ | $\frac{\sqrt{3}}{2}$ |

Complete these statements using values from the list.

$\cos 45° =$ .....

$\tan 60° =$ ..... [2]

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**9** **(a)** Write 63 as a product of its prime factors.

..... [2]

**(b)** Find the lowest common multiple (LCM) of 63 and 42.

..... [2]

**(c)** Find the highest common factor (HCF) of $63a^5c^2$ and $42a^2c^5$.

..... [2]

**10** Write $0.7\dot{3}$ as a fraction, giving your answer in its simplest form.

..... [3]

**11** Find the number of sides of a regular polygon with interior angle 140°.

..... [2]

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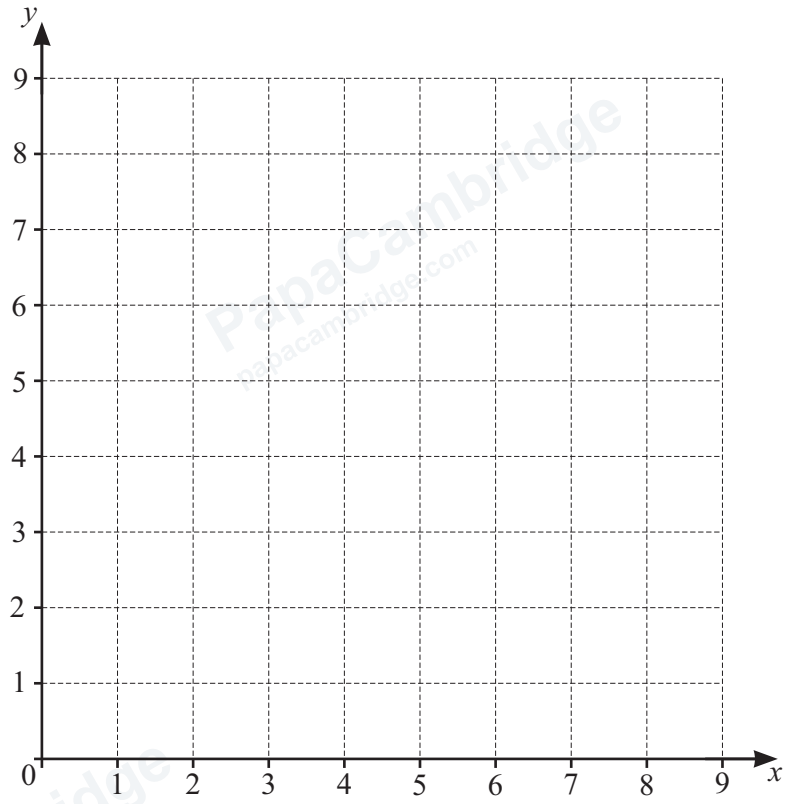
**12**




**(a)** On the grid, draw these four straight lines.

$x = 8$
$y = 2$
$x + y = 8$
$2y - x = 4$ [5]

**(b)** Region $R$ satisfies these four inequalities.

$x \leqslant 8$
$y \geqslant 2$
$x + y \geqslant 8$
$2y - x \leqslant 4$

By shading the unwanted regions of the grid, find and label the region $R$. [2]

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**13** A sector of a circle has sector angle 90° and radius 12 cm.

Calculate the arc length of the sector.
Give your answer in terms of π.

..... cm [2]

**14** **(a)** The $n$th term of a sequence is given by $n^2 - 3$.

Write down the first three terms of this sequence.

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

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

4 12 36 108

Find the $n$th term of this sequence.

..... [2]

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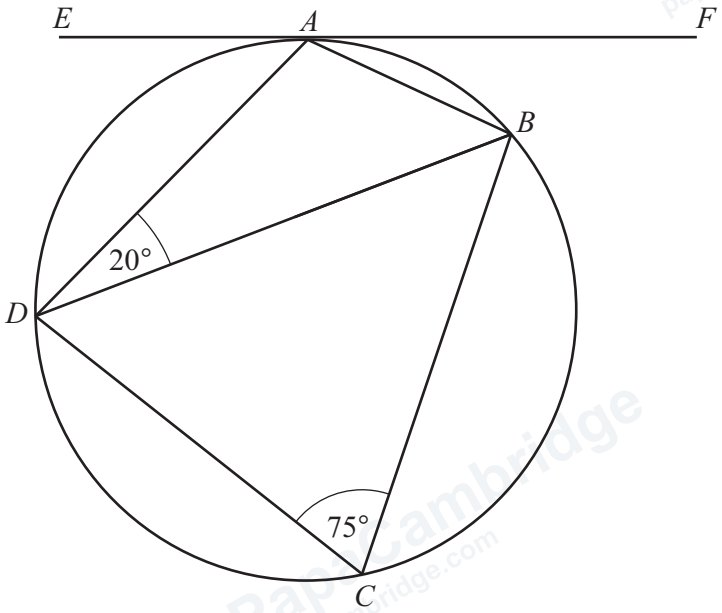
**15**




NOT TO SCALE

$A$, $B$, $C$ and $D$ are points on a circle.
$EF$ is a tangent to the circle at $A$.
Angle $ADB = 20°$ and angle $BCD = 75°$.

Find angle $EAD$.
Give a reason for each step of your working.

angle $EAD =$ ..... [5]

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**16** The volume of a sphere is 500 $cm^3$.

Using the approximation of 3 for $\pi$, find an estimate for the radius of the sphere.

..... cm [2]

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

$$(4-\sqrt{7})(3+2\sqrt{7})$$

..... [2]

**(b)** Rationalise the denominator and simplify.

$$\frac{2}{3-\sqrt{5}}$$

..... [3]

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**18** Marwa has these 10 numbered tiles.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |

**(a)** Marwa picks one of the tiles at random.
She replaces the tile and then picks a second tile at random.

Find the probability that the two tiles have the same **even** number.

..... [3]

**(b)** From the 10 numbered tiles, Marwa now picks three tiles at random without replacement.

Find the probability that the sum of the numbers on the three tiles is 11.

..... [3]

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**19** Expand and simplify.

$$(3x+1)(x+4)(x-2)$$

..... [3]

**20** Two bottles are mathematically similar.
The volume of the larger bottle is 216 $cm^3$ and the volume of the smaller bottle is 27 $cm^3$.
The height of the larger bottle is 10 cm and the height of the smaller bottle is $h$ cm.

Find the value of $h$.

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

**21** **(a)** Write $x^2+8x-7$ in the form $(x+a)^2+b$ where $a$ and $b$ are integers.

..... [2]

**(b)** Write down the coordinates of the turning point of the curve $y = x^2+8x-7$.

( ..... , ..... ) [1]

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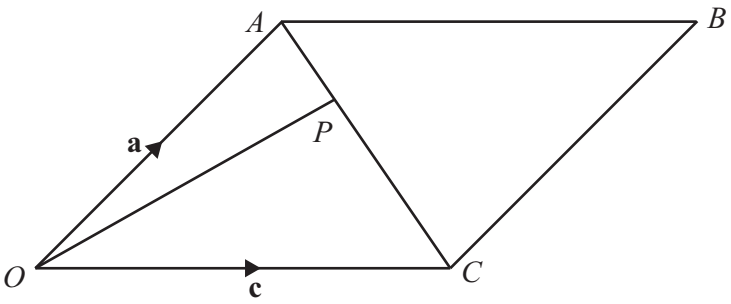
**22**




NOT TO SCALE

$OABC$ is a parallelogram.
$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OC} = \mathbf{c}$.
$P$ is a point on $AC$ and $AP : PC = 1 : 4$.

**(a)** Find, in terms of **a** and **c**, in its simplest form

**(i)** $\overrightarrow{AP}$

$\overrightarrow{AP} =$ ..... [2]

**(ii)** $\overrightarrow{OP}$.

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

**(b)** $Q$ is a point on $AB$ and $\overrightarrow{AQ} = \frac{1}{4}\mathbf{c}$.

Show that $O$, $P$ and $Q$ lie in a straight line.

[2]

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**23** The equation of a curve is $y = 2x^2 - 11x + 12$.

**(a)** Find the gradient of the tangent to the curve at $x = 2$.

..... [3]

**(b)** Line $L$ intersects the curve at $x = 2$.
Line $L$ is perpendicular to the tangent to the curve at $x = 2$.

Find the equation of line $L$.

..... [4]

**24** $7^{2x+1} = 49^{2-x}$

Find the value of $x$.

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

**Question 25 is on the back page.**

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**25** The straight line $y = 7 - 4x$ intersects the curve $y = 4 + 3x - 2x^2$ at two points.

Find the coordinates of these two points.

( ..... , ..... )

( ..... , ..... )

[5]

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