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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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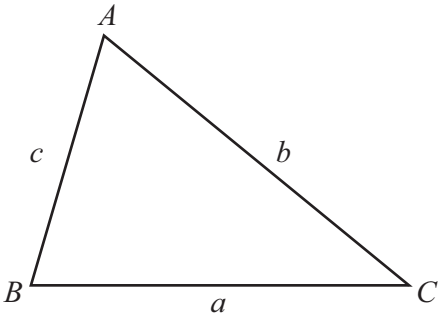
List of formulas

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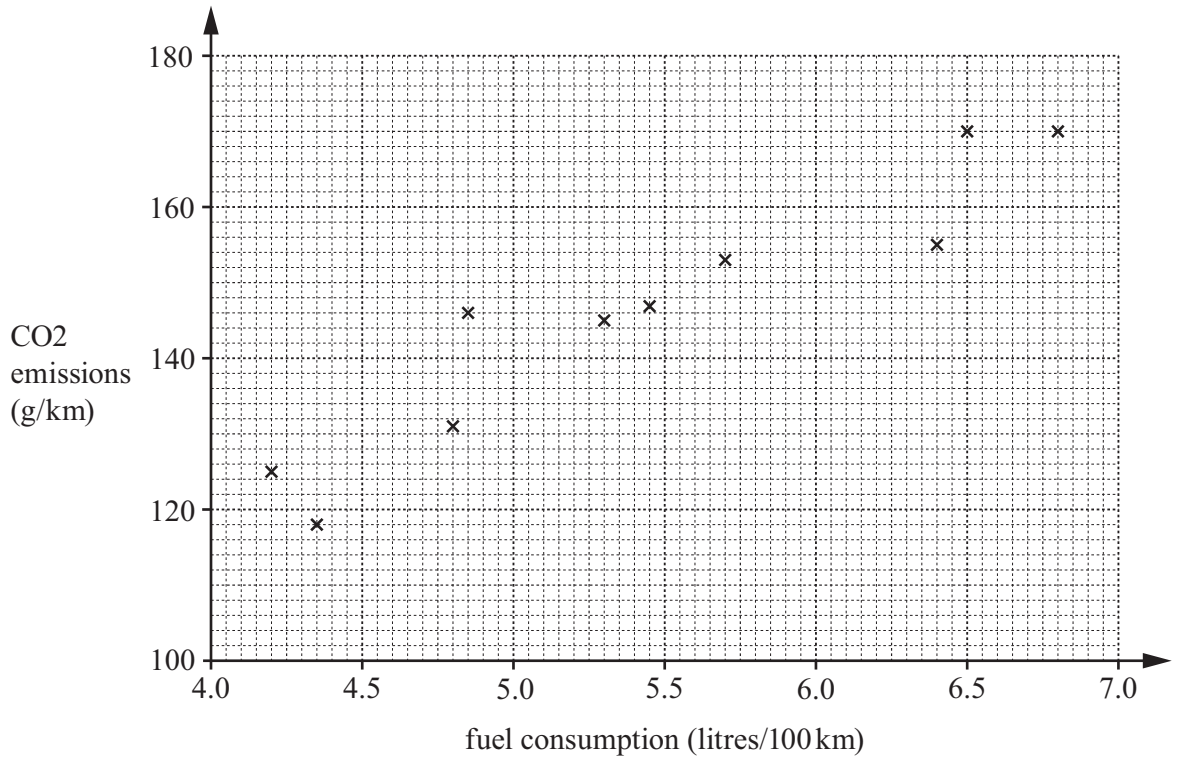
Calculators must **not** be used in this paper.

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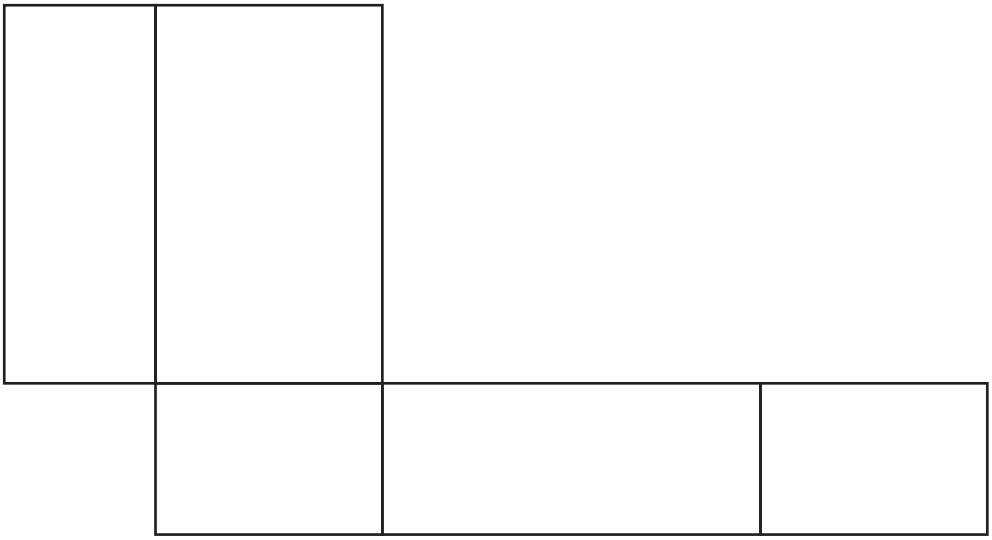
2 The diagram shows an **accurate** net of an open box in the shape of a cuboid.
All the dimensions are whole numbers of centimetres.



(a) Find the total area of the net.

View solution

..... cm^2 [3]

(b) Find the volume of the open box.

View solution

..... cm^3 [2]

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

View solution

Give your answer as a fraction in its simplest form.

..... [2]

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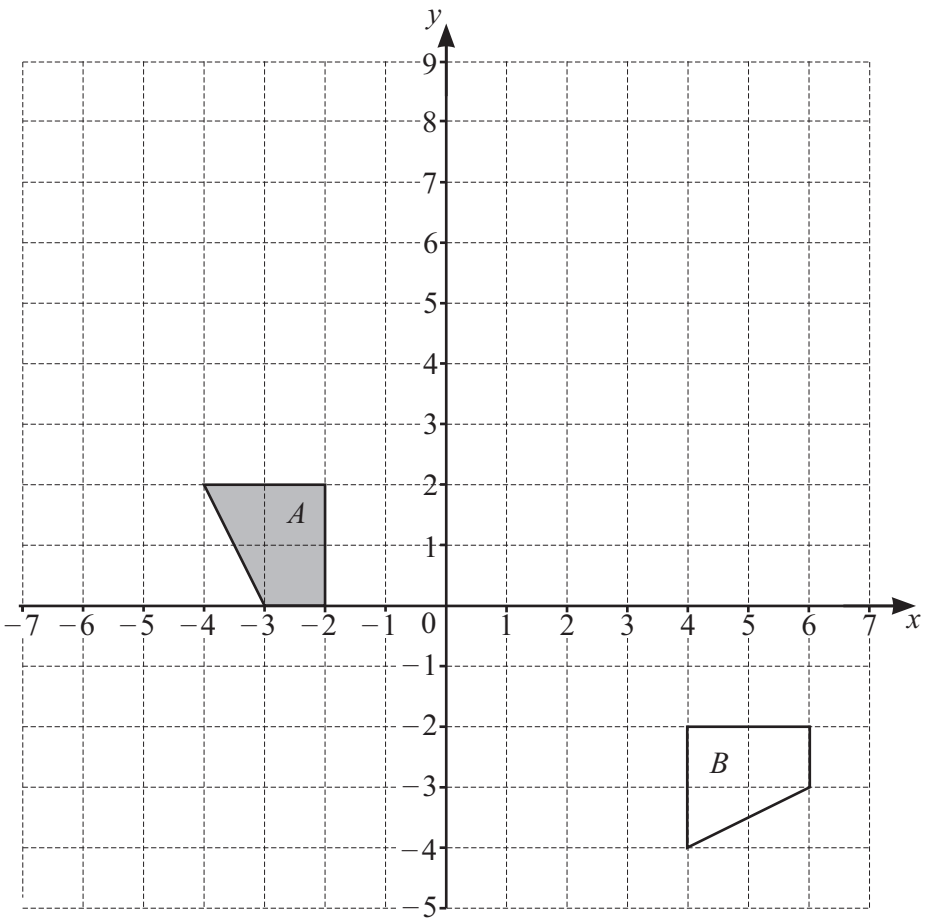
4 Work out $\frac{1}{6} \div \frac{2}{7}$.

View solution

..... [2]

5



View solution

(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]

View solution

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

.....

..... [3]

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

View solution

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

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

View solution

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

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

View solution

7 Factorise.

$6wx - 4xy$

..... [2]

View solution

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.

View solution

..... [2]

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

View solution

..... [2]

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

View solution

..... [2]

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

View solution

..... [3]

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

View solution

..... [2]

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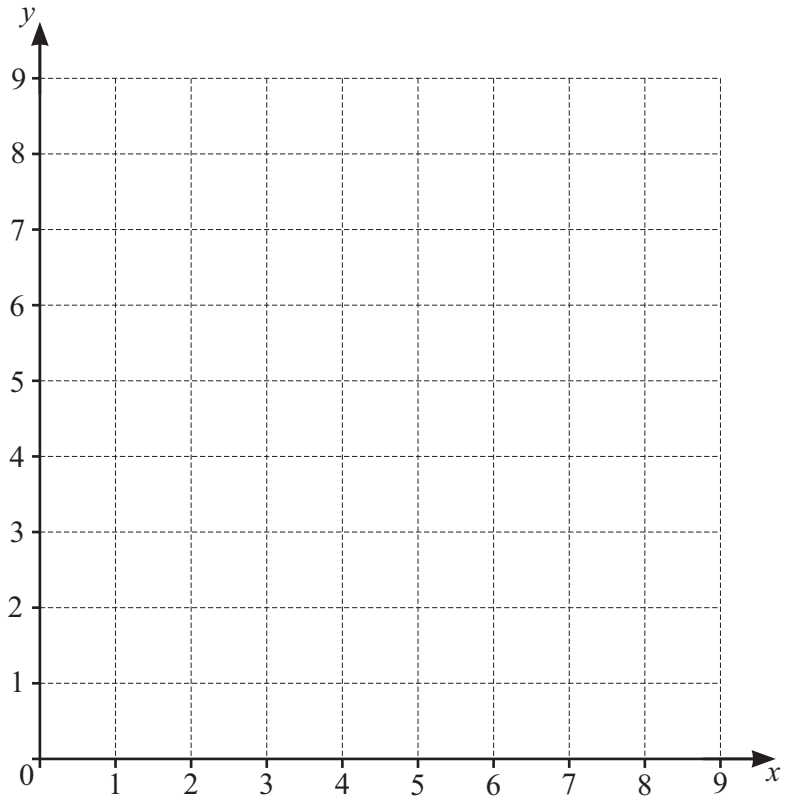
12



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

View solution

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

(b) Region R satisfies these four inequalities.

View solution

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

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.

View solution

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 $n^2 - 3$.

View solution

Write down the first three terms of this sequence.

.... [2]

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

View solution

4 12 36 108

Find the *n*th term of this sequence.

..... [2]

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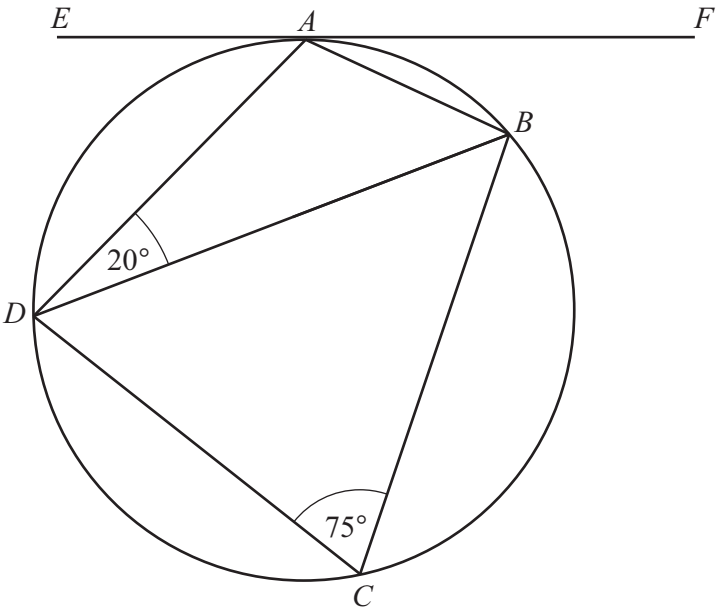
15

View solution



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 $500\,\text{cm}^3$.

Using the approximation of 3 for π, find an estimate for the radius of the sphere.

View solution

..... cm [2]

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

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

View solution

..... [2]

(b) Rationalise the denominator and simplify.

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

View solution

..... [3]

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18 Marwa has these 10 numbered tiles.

1	2	2	3	3	4	4	4	4	4

View solution

(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]

View solution

(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.

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

View solution

..... [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.

View solution

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

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

View solution

..... [2]

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

View solution

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

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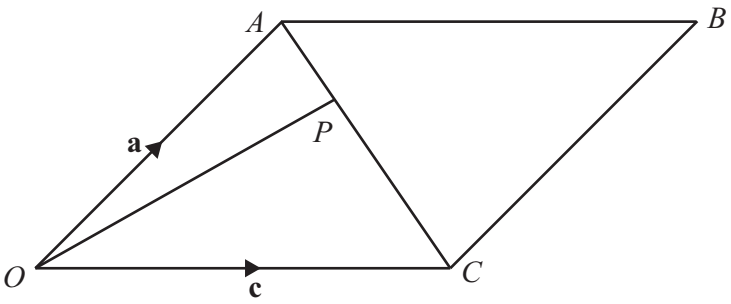
22



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

View solution

(i) $\overrightarrow{AP}$

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

(ii) $\overrightarrow{OP}$.

View solution

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

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

View solution

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 $x = 2$.

View solution

..... [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.

View solution

..... [4]

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

View solution

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.

View solution

(..... , ...)

(..... , ...)
[5]

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