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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.

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 .

$$V = \frac{1}{3}\pi r^2 h$$

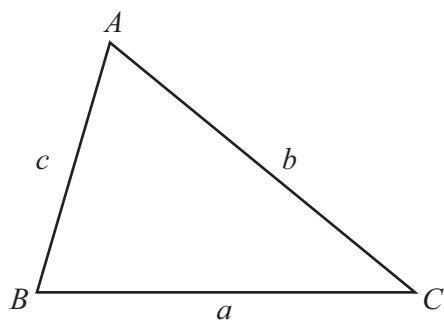
Volume, V , of sphere of radius r .

$$V = \frac{4}{3}\pi r^3$$

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,



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

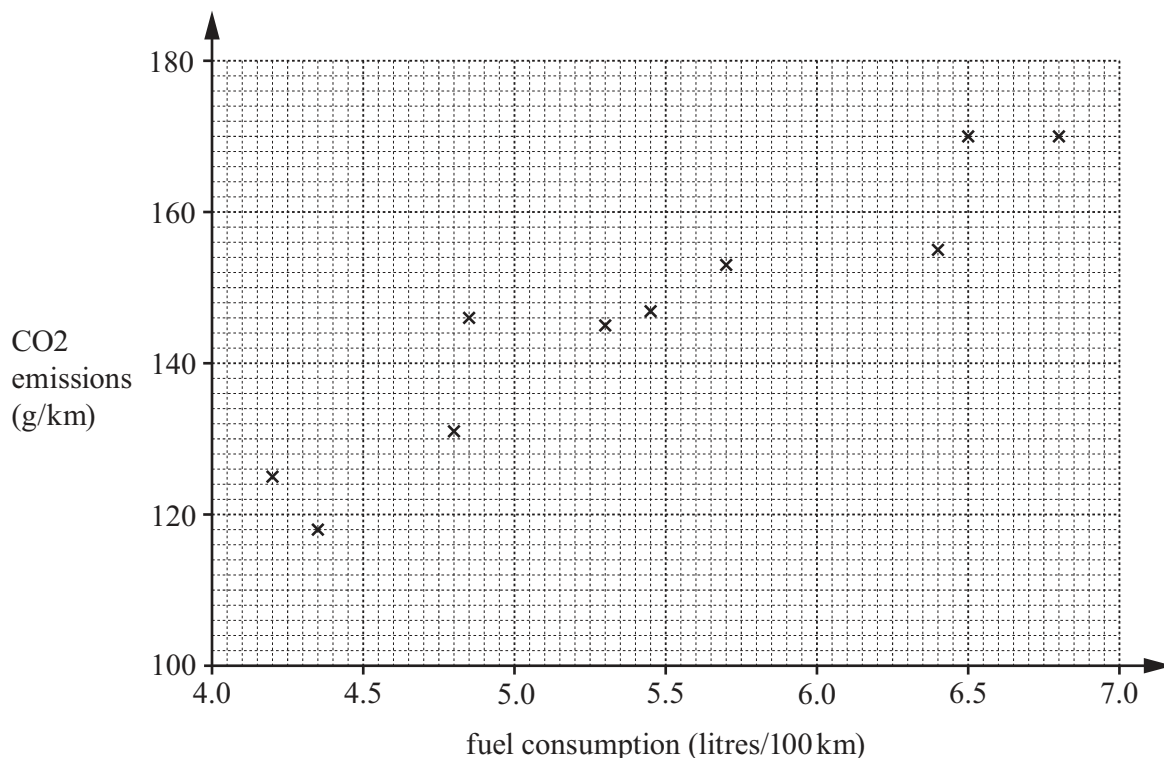
$$a^2 = b^2 + c^2 - 2bc \cos A$$

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



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]

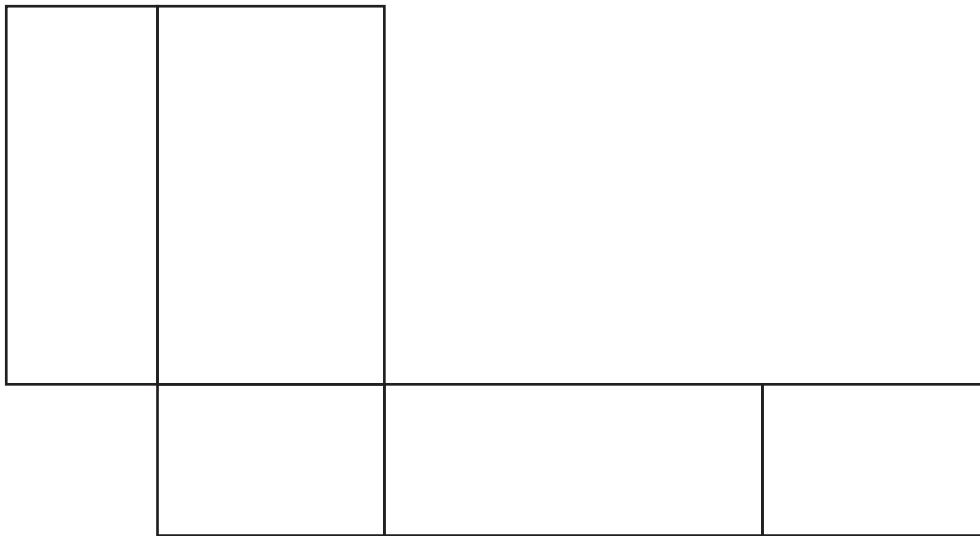
- (d) Paulo's car has CO₂ emissions of 140 g/km.

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

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



- 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.

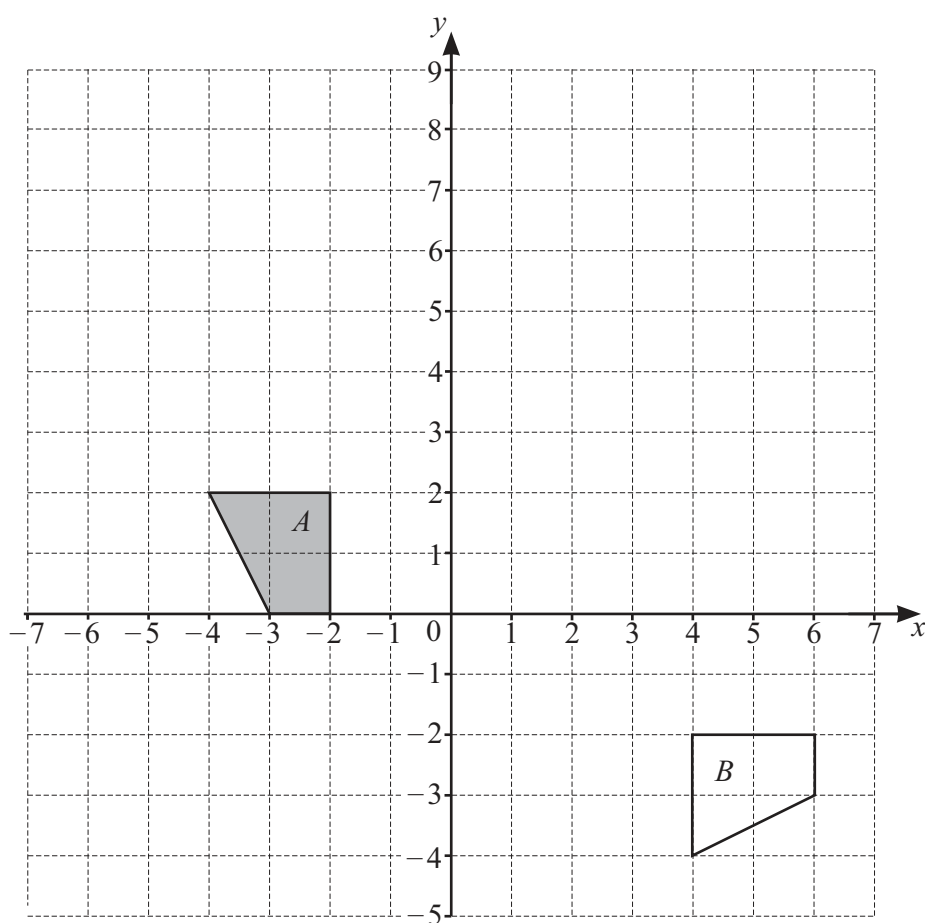
..... [2]



- 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]



6

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

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

$$E = \dots\dots\dots [2]$$

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

$$c = \dots\dots\dots [3]$$

7 Factorise.

$$6wx - 4xy$$

$$\dots\dots\dots [2]$$

8

$\frac{1}{\sqrt{3}}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\sqrt{3}$	$\frac{\sqrt{3}}{2}$
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Complete these statements using values from the list.

$$\cos 45^\circ = \dots\dots\dots$$

$$\tan 60^\circ = \dots\dots\dots$$

[2]



- 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]

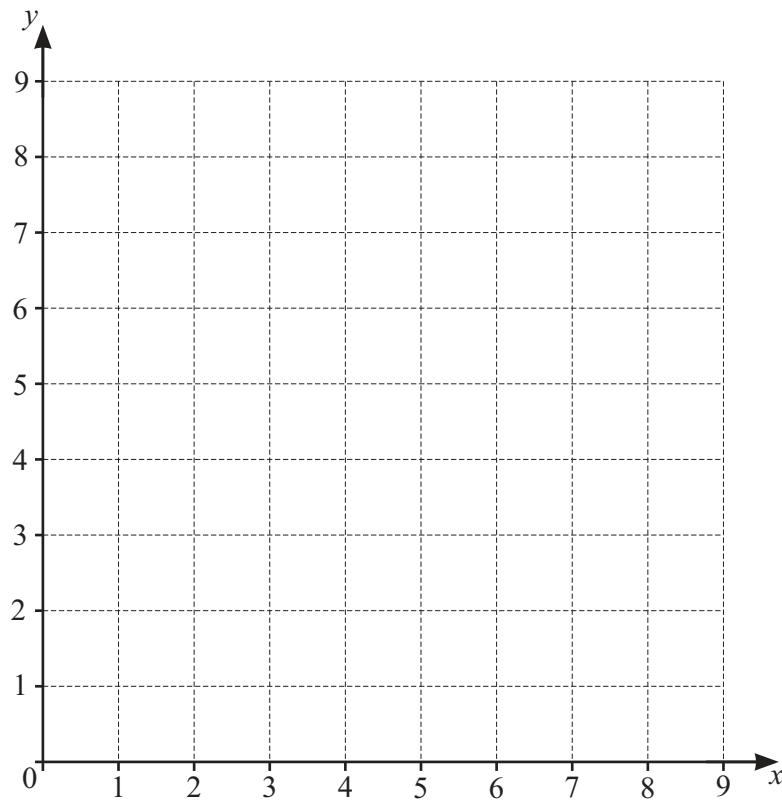
- 10 Write $0.\dot{7}3$ as a fraction, giving your answer in its simplest form.

..... [3]

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

..... [2]





(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.

$$x \leq 8$$

$$y \geq 2$$

$$x + y \geq 8$$

$$2y - x \leq 4$$

By shading the unwanted regions of the grid, find and label the region R .

[2]



- 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]

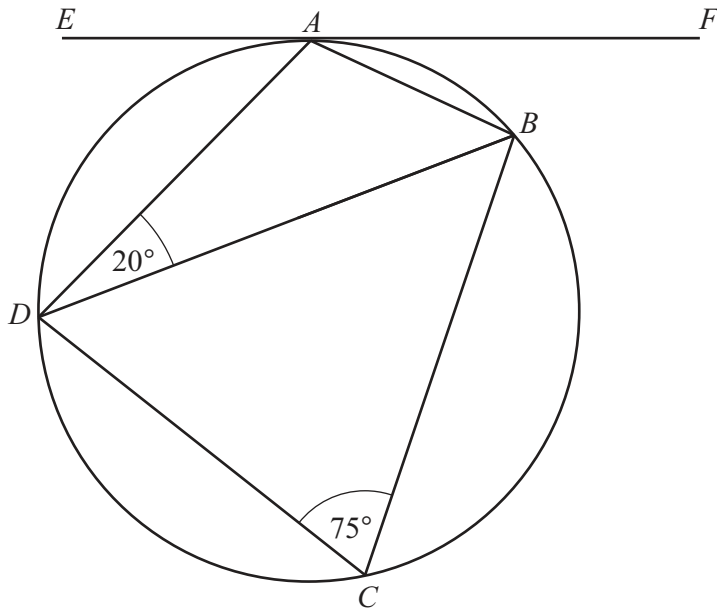
- (b) These are the first four terms of another sequence.

4 12 36 108

Find the n th term of this sequence.

..... [2]





NOT TO SCALE

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

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

angle $EAD = \dots\dots\dots$ [5]



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

Using the approximation of 3 for π , 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]



18 Marwa has these 10 numbered tiles.



- (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]



- 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.

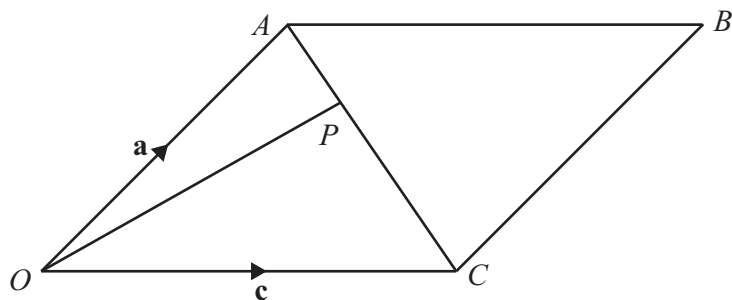
..... [2]

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

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

[Turn over]





NOT TO SCALE

$OABC$ is a parallelogram.

$\vec{OA} = \mathbf{a}$ and $\vec{OC} = \mathbf{c}$.

P is a point on AC and $AP : PC = 1 : 4$.

(a) Find, in terms of $\mathbf{a}$ and $\mathbf{c}$, in its simplest form

(i) $\vec{AP}$

$$\vec{AP} = \dots\dots\dots [2]$$

(ii) $\vec{OP}$.

$$\vec{OP} = \dots\dots\dots [1]$$

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

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

[2]



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.





- 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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