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8753223750

MATHEMATICS **0580/31**

Paper 3 Calculator (Core) **May/June 2025**

1 hour 30 minutes

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 or correction fluid.
- Do **not** write on any bar codes.
- You should use a scientific calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For π, use either your calculator value or 3.142.

INFORMATION

- The total mark for this paper is 80.
- 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.	$V = \frac{4}{3}\pi r^3$

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1 The pictogram shows the number of goals scored by teams *A*, *B* and *C*.

Team	Goals
A	
B	
C	
D	

Key :  represents 4 goals

(a) Work out the number of goals scored by team *B*.

..... [1]

(b) Teams *A*, *B*, *C* and *D* scored a total of 43 goals.

Complete the pictogram.

[3]

2 An angle measures 157°.

Write down the mathematical name for this type of angle.

..... [1]

3 Find the value of $\sqrt{1.96}$.

..... [1]

4 Calculate the number of months in 5 years.

..... [1]

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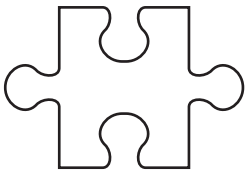

(a) Write down the order of rotational symmetry for this shape.

..... [1]

(b) Draw all the lines of symmetry on this shape. [2]

6 In triangle ABC, $AC = 6.4\,\text{cm}$ and $BC = 5.3\,\text{cm}$.

Using a ruler and compasses only, construct triangle ABC.
Leave in your construction arcs.
The line AB has been drawn for you.

A B

[2]

7 Solve.

$3y = 18$

$y =$ ..... [1]

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8 **(a)** $T = 3(5P - 8) + 4$

Find the value of T when $P = 12$.

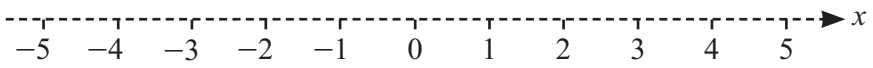
$T =$ ..... [2]

(b) $W = 4t + 8$

Find the value of t when $W = 369$.

$t =$ ..... [2]

9 Represent the inequality $-3 < x \leqslant 2$ on the number line.



[2]

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10 $\frac{3}{7}$ 0.41 $\frac{17}{41}$ 42%

Write these numbers in order, starting with the smallest.

..... < ..... < ..... < ..... [2]
smallest

11 A plane leaves Seattle at 07 30 on Tuesday and arrives in Seoul 10 hours and 55 minutes later. The local time in Seoul is 16 hours ahead of the local time in Seattle.

Work out the day and time in Seoul when the plane arrives.

Day ..... Time ..... [3]

12 The equation of line L is $y = 5x - 3$.

(a) Write down the gradient of line L.

..... [1]

(b) Write down the equation of a line parallel to line L.

$y =$ ..... [1]

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13 The scale drawing shows the position of ship *A*.
The scale is 1 centimetre represents 50 kilometres.

Scale: 1 cm to 50 km

Ship *B* is 300 km from ship *A* on a bearing of 105°.

On the scale drawing mark the position of ship *B*.

[2]

14 Tom needs 225 g of flour to make 10 cakes.
A shop sells flour in 500 g bags.

Work out the number of bags of flour Tom needs to make 70 cakes.

..... [3]

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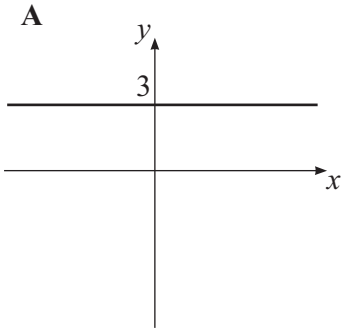
15

A



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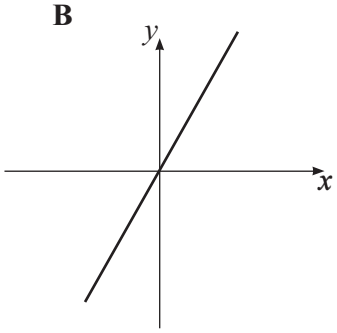

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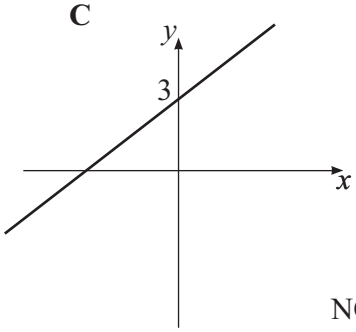

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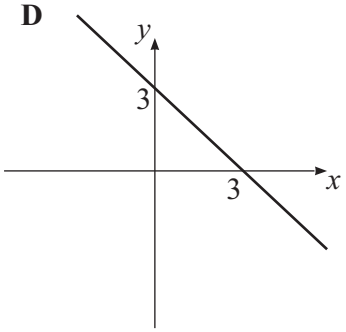

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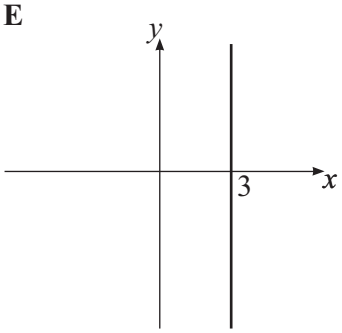

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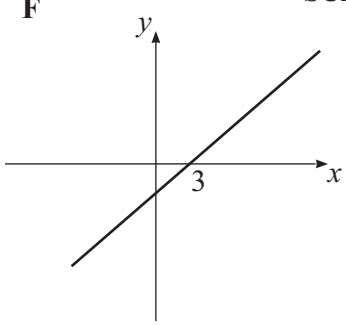

Write down the letter of the graph that shows these lines.

(a) $x = 3$

..... [1]

(b) $y = 3x$

..... [1]

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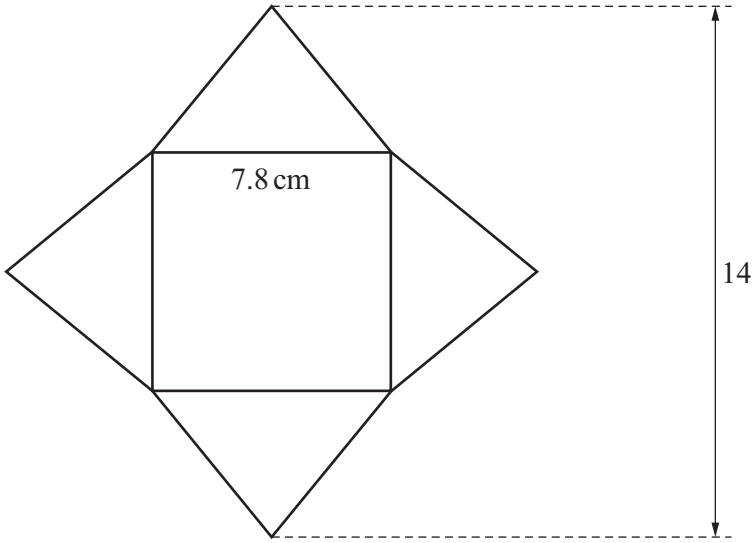
16 The diagram shows a shape made from a square and four congruent isosceles triangles.



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Work out the area of this shape.

..... cm^2 [3]

17 The volume of a cylinder is $863.5\,cm^3$.
The height of the cylinder is 12.3 cm.

Find the radius of the cylinder.

..... cm [3]

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18 Dara changes 5700 Thai baht to dollars.
The exchange rate is \$1 = 34.18 Thai baht.

Calculate the amount that Dara receives.

\$ ..... [1]

19 A four-sided dice is numbered 1 to 4.
Hrishi throws the dice 50 times.
The results are shown in the table.

Number	Frequency
1	14
2	15
3	9
4	12

Calculate the mean.

..... [2]

20 A tin contains red, yellow, green and brown sweets.
The table shows some of the probabilities of picking a sweet of each colour at random.

Colour	Red	Yellow	Green	Brown
Probability	0.68		0.05	0.14

Complete the table.

[2]

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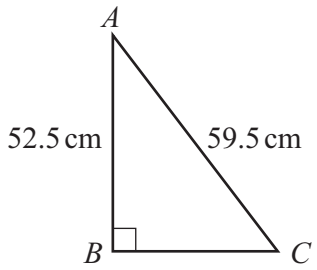
21 The diagram shows a right-angled triangle ABC.



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Calculate BC.

$BC =$ ..... cm [3]

22 **(a)** Anil invests \$2000 and Baz invests \$7500.

Write the ratio money invested by Anil : money invested by Baz in its simplest form.

..... : ..... [1]

(b) Kamil and Lavik share some money in the ratio Kamil : Lavik = 5 : 9.
Lavik receives \$72 more than Kamil.

Calculate the total amount of money they share.

\$ ..... [2]

(c) Vanisha invests \$4000 for 5 years at a rate of 3.5% per year compound interest.

Calculate the total interest earned during the 5 years.

\$ ..... [3]

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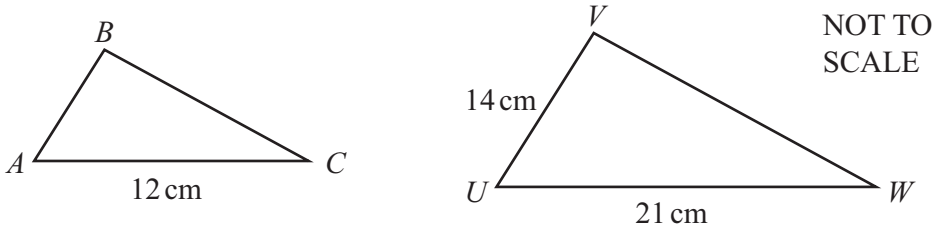
23 The population of an island increases from 18 400 to 19 780.

Calculate the percentage increase.

..... % [2]

24



Triangle *ABC* is mathematically similar to triangle *UVW*.

Calculate *AB*.

AB = ... cm [2]

25 A bar of gold in the shape of a cuboid has dimensions 2 cm by 4 cm by 6.5 cm.
The density of gold is 19.32 g/cm^3.

Calculate the mass of this bar of gold.

$\left[\text{Density} = \frac{\text{mass}}{\text{volume}}\right]$

..... g [3]

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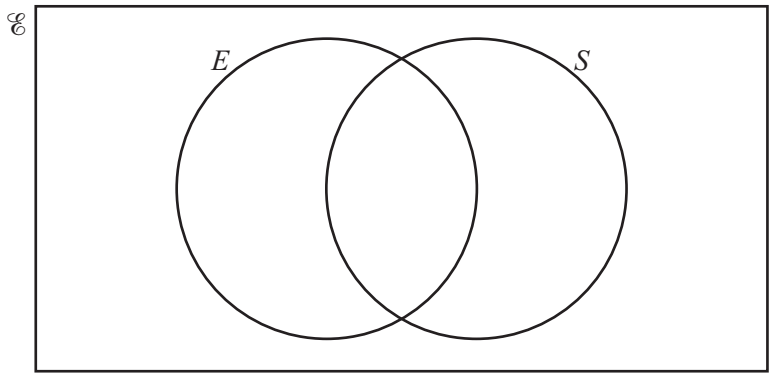
26 Li asks 28 students if they speak English (E) and if they speak Spanish (S).

15 students speak English.
12 students speak Spanish.
6 do not speak English and do not speak Spanish.



(a) Complete the Venn diagram.

[2]

(b) Write down how many students speak English but do not speak Spanish.

..... [1]

(c) Find $n(E \cup S)$.

..... [1]

27 The height, h metres, of a building is 105 m, correct to the nearest metre.

Complete this statement about the value of h.

..... $\leqslant h <$ ..... [2]

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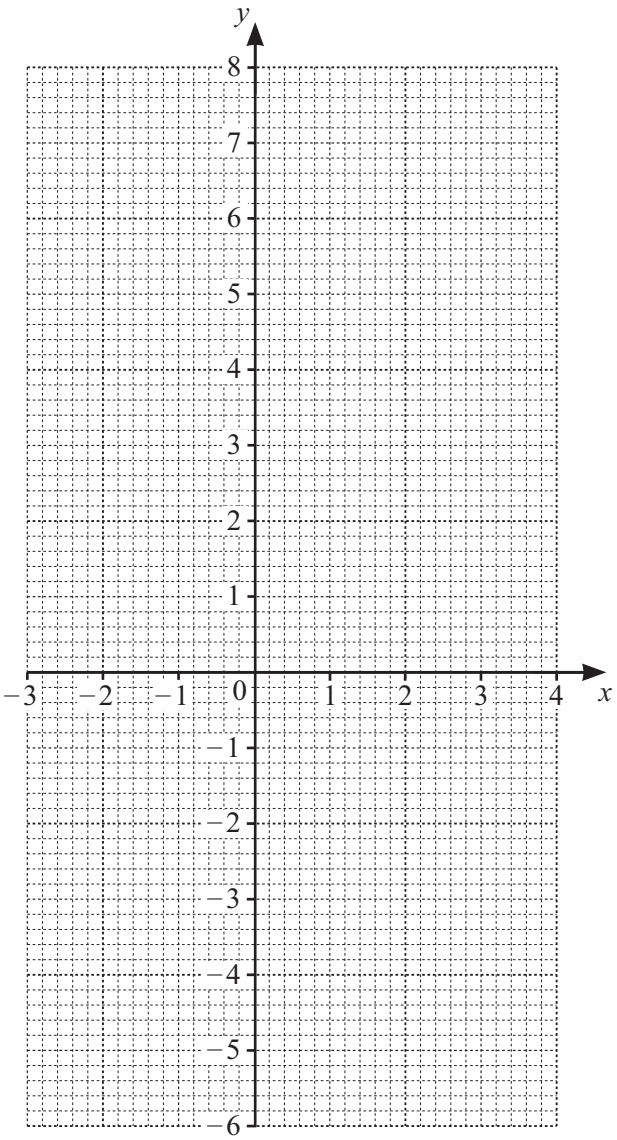
28 **(a)** **(i)** Complete the table of values for $y = x^2 - x - 5$.

x	−3	−2	−1	0	1	2	3	4
y		1	−3			−3	1	

[2]

(ii) On the grid, draw the graph of $y = x^2 - x - 5$ for $-3 \leqslant x \leqslant 4$.



[4]

(b) Write down the equation of the line of symmetry of the graph.

..... [1]

(c) Use the graph to solve the equation $x^2 - x - 5 = 0$.

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

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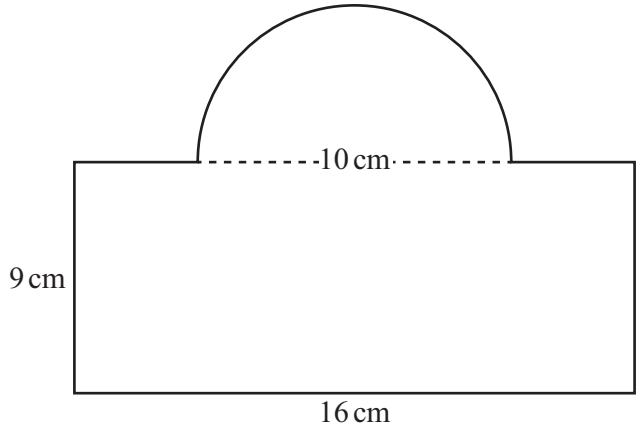

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This shape is made from a rectangle and a semicircle.
The diameter of the semicircle is 10 cm.

Calculate the perimeter of this shape.

..... cm [3]

Question 30 is printed on the next page.

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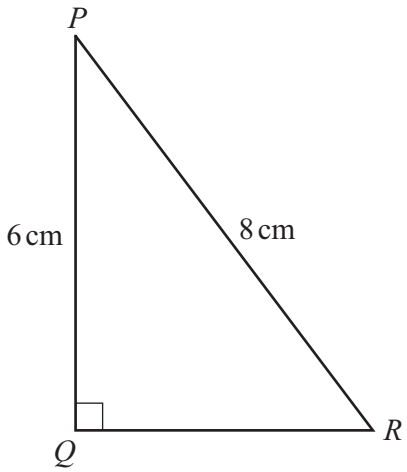

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The diagram shows a right-angled triangle, PQR.

Calculate angle QRP.

Angle QRP = ... [2]

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