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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.

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 .

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



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

Team	Goals
<i>A</i>	
<i>B</i>	
<i>C</i>	
<i>D</i>	

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]

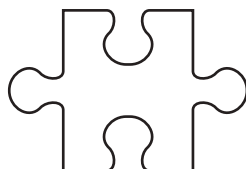
- 3 Find the value of $\sqrt{1.96}$.

..... [1]

- 4 Calculate the number of months in 5 years.

..... [1]





(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 , $AC = 6.4$ cm and $BC = 5.3$ cm.

Using a ruler and compasses only, construct triangle ABC .

Leave in your construction arcs.

The line AB has been drawn for you.



[2]

7 Solve.

$$3y = 18$$

$y =$ [1]





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

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

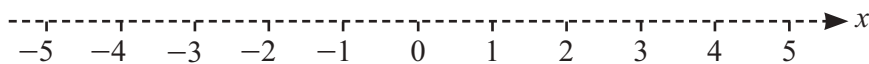
$T = \dots\dots\dots$ [2]

(b) $W = 4t + 8$

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

$t = \dots\dots\dots$ [2]

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



[2]





- 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]

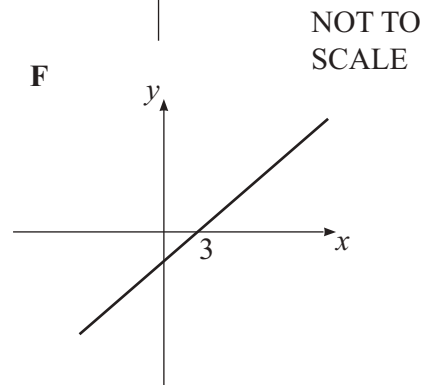
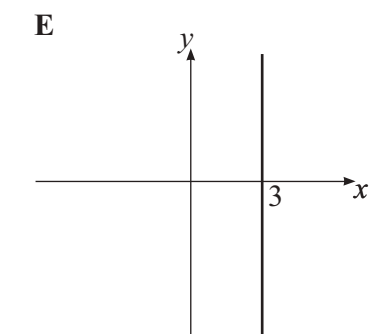
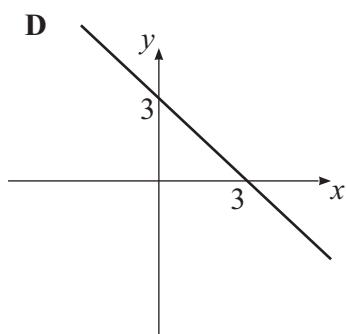
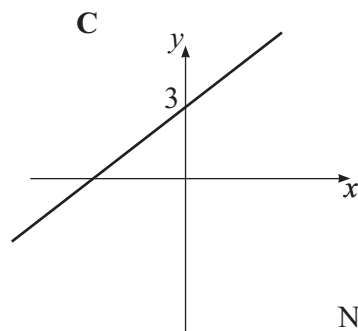
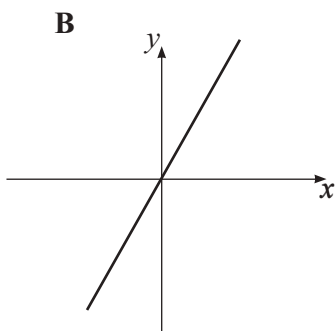
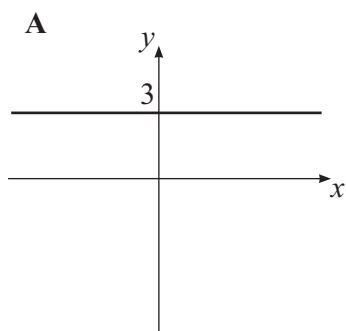
- 14 Tom needs 225 g of flour to make 10 cakes.
A shop sells flour in 500 g bags.

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

..... [3]



15



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

(a) $x = 3$

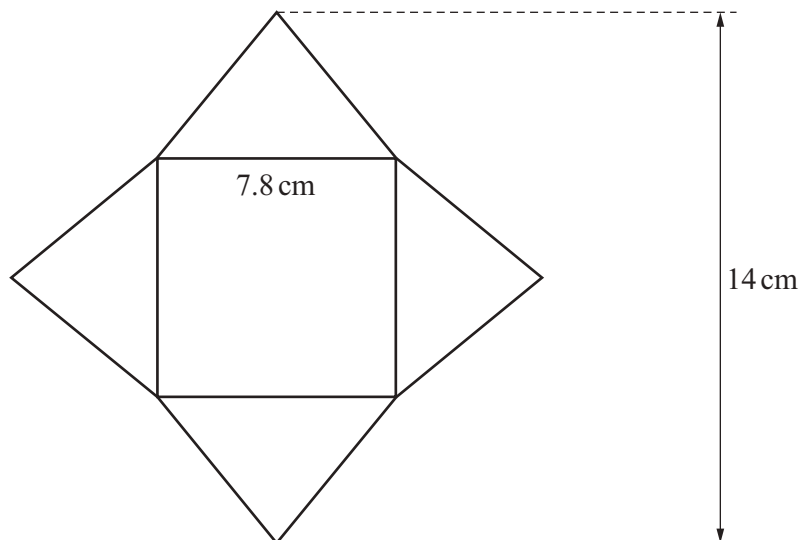
..... [1]

(b) $y = 3x$

..... [1]



- 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]



- 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.

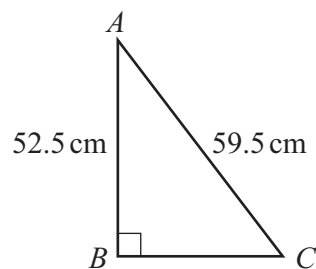
Colour	Red	Yellow	Green	Brown
Probability	0.68		0.05	0.14

Complete the table.

[2]



- 21 The diagram shows a right-angled triangle ABC .



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Calculate BC .

$$BC = \dots\dots\dots \text{ cm } [3]$$

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

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

$$\dots\dots\dots : \dots\dots\dots [1]$$

- (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.

$$\text{\$ } \dots\dots\dots [2]$$

- (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.

$$\text{\$ } \dots\dots\dots [3]$$

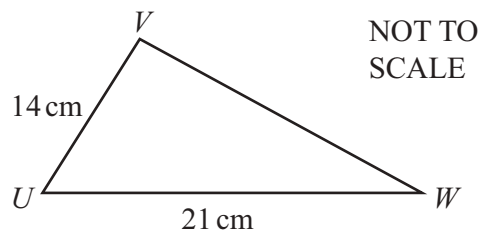
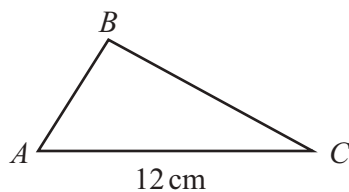


- 23 The population of an island increases from 18 400 to 19 780.

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]

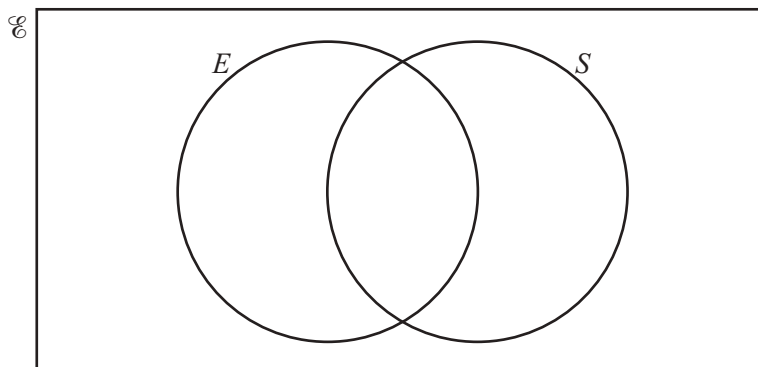


- 26 Li asks 28 students if they speak English (E) and if they speak Spanish (S).

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 .

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

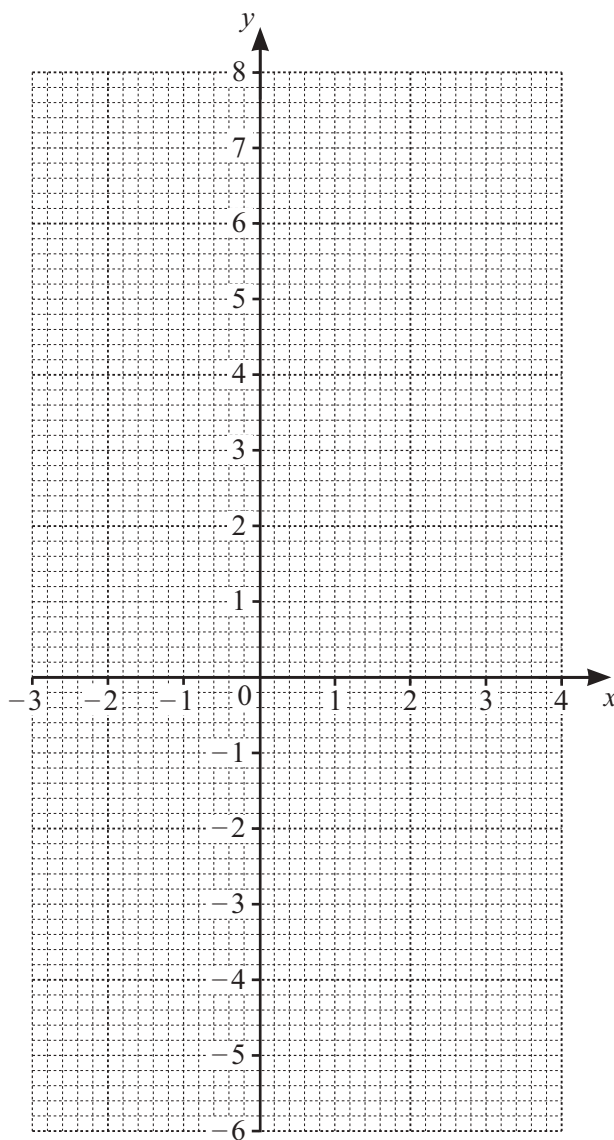


28 (a) (i) Complete the table of values for $y = x^2 - x - 5$.

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 $-3 \leq x \leq 4$.



[4]

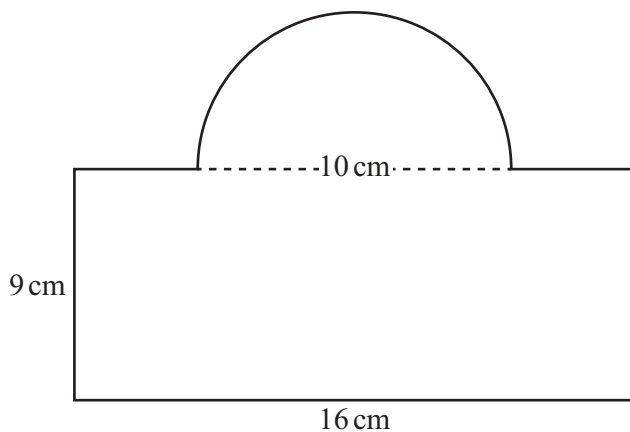
(b) Write down the equation of the line of symmetry of the graph.

..... [1]

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

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]





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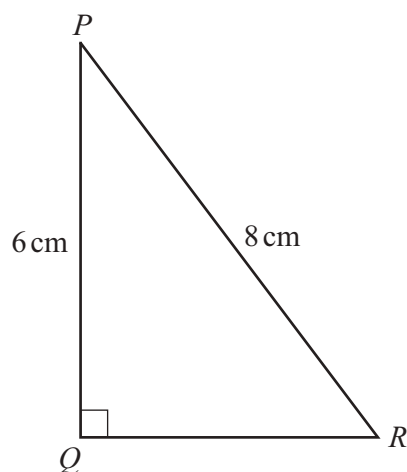
This shape is made from a rectangle and a semicircle.
The diameter of the semicircle is 10 cm.

Calculate the perimeter of this shape.

..... cm [3]

Question 30 is printed on the next page.





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The diagram shows a right-angled triangle, PQR .

Calculate angle QRP .

Angle $QRP = \dots\dots\dots$ [2]

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