



# Cambridge IGCSE™

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## MATHEMATICS

0580/04

Paper 4 Calculator (Extended)

For examination from 2025

PRACTICE PAPER

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 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  $\pi$ , use either your calculator value or 3.142.

## 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 **18** 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  $h$ .  $V = \frac{1}{3}Ah$

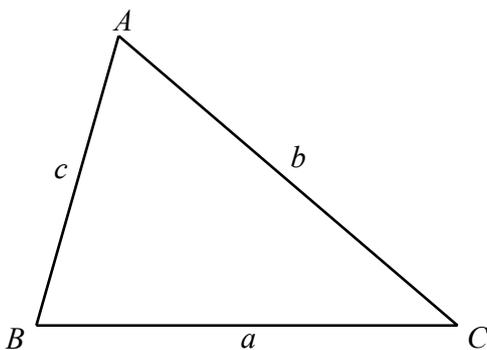
Volume,  $V$ , of cylinder of radius  $r$ , height  $h$ .  $V = \pi r^2 h$

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,



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

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

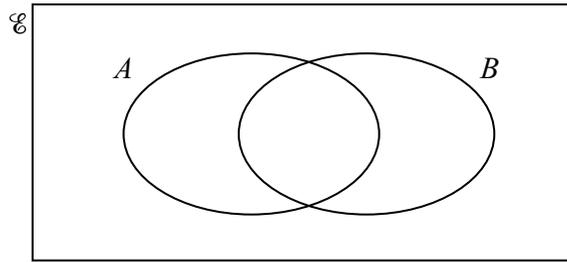
$$\text{Area} = \frac{1}{2}ab \sin C$$

1  $y = mx + c$

Find the value of  $y$  when  $m = -3$ ,  $x = -2$  and  $c = -8$ .

$y = \dots\dots\dots$  [2]

2



On the Venn diagram, shade the region  $A \cap B$ . [1]

3 In triangle  $ABC$ ,  $BC = 7.6$  cm and  $AC = 6.2$  cm.

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



[2]

4 Write  $2^{-4}$  as a decimal.

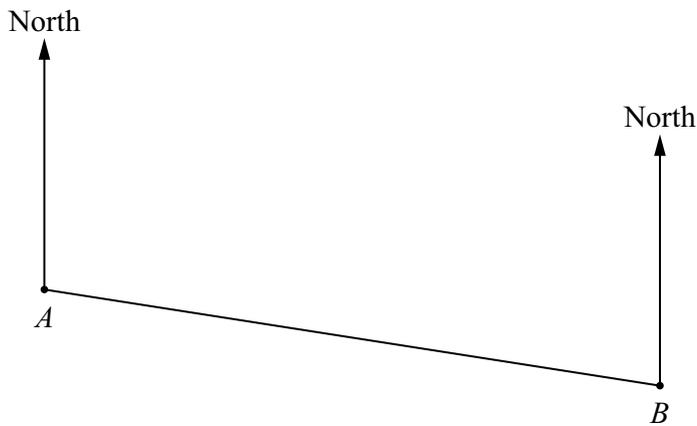
$\dots\dots\dots$  [1]

5 Simplify.

$$\frac{p}{2q} \times \frac{4pq}{t}$$

..... [2]

6



NOT TO SCALE

The bearing of  $B$  from  $A$  is  $105^\circ$ .

Find the bearing of  $A$  from  $B$ .

..... [2]

7 Solve the equation.

$$\frac{1-x}{3} = 5$$

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

- 8 A train of length 105 m takes 11 seconds to pass completely through a station of length 225 m.

Calculate the speed of the train in km/h.

..... km/h [3]

- 9 Divide \$24 in the ratio 7 : 5.

\$..... : \$..... [2]

- 10 Write \$24.60 as a fraction of \$2870.  
Give your answer in its simplest form.

..... [2]

- 11 In a sale the original prices are reduced by 15%.

(a) Calculate the sale price of a book that has an original price of \$12.

\$ ..... [2]

(b) Calculate the original price of a jacket that has a sale price of \$38.25 .

\$ ..... [2]

- 12 (a) Dean invests \$500 for 10 years at a rate of 1.7% per year simple interest.

Calculate the total interest earned during the 10 years.

\$ ..... [2]

- (b) Ollie invests \$200 at a rate of 0.0035% **per day** compound interest.

Calculate the value of Ollie's investment at the end of 1 year. [1 year = 365 days.]

\$ ..... [2]

- 13 Simplify.

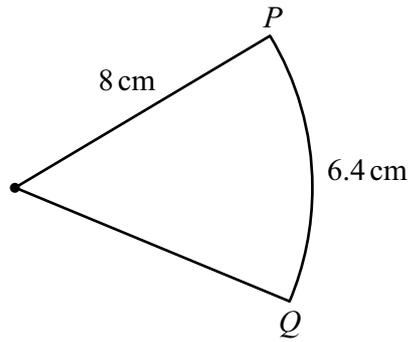
(a)  $(5x^4)^3$

..... [2]

(b)  $(256x^{256})^{\frac{3}{8}}$

..... [2]

14

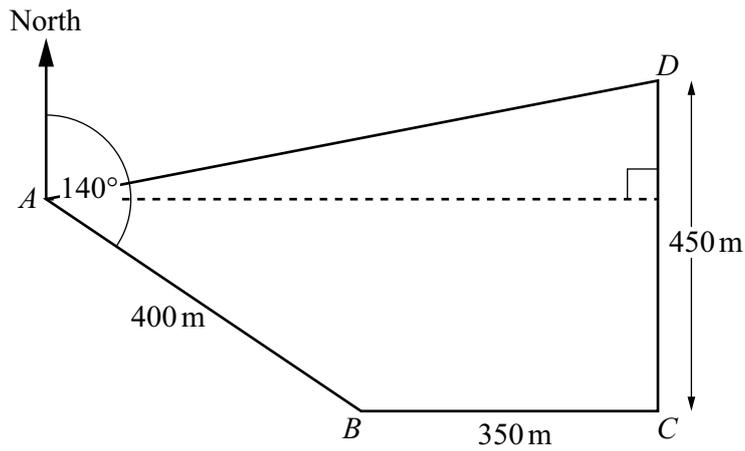
NOT TO  
SCALE

The diagram shows a sector of a circle of radius 8 cm.  
The length of the arc  $PQ$  is 6.4 cm.

Find the area of the sector.

.....cm<sup>2</sup> [4]

15

NOT TO  
SCALE

The diagram shows a field  $ABCD$ .  
 The bearing of  $B$  from  $A$  is  $140^\circ$ .  
 $C$  is due east of  $B$  and  $D$  is due north of  $C$ .  
 $AB = 400$  m,  $BC = 350$  m and  $CD = 450$  m.

(a) Show that the bearing of  $D$  from  $B$  is  $37.9^\circ$ , correct to 1 decimal place.

..... [2]

(b) Calculate the distance from  $D$  to  $A$ .

..... m [6]

(c) Jono runs around the field from  $A$  to  $B$ ,  $B$  to  $C$ ,  $C$  to  $D$  and  $D$  to  $A$ .  
He runs at a speed of 3 m/s.

Calculate the total time Jono takes to run around the field.  
Give your answer in minutes and seconds, correct to the nearest second.

..... min ..... s [4]

16 The speed of each of 200 cars passing a building is measured.  
The table shows the results.

Speed ( $v$ km/h)	$0 < v \leq 20$	$20 < v \leq 40$	$40 < v \leq 45$	$45 < v \leq 50$	$50 < v \leq 60$	$60 < v \leq 80$
Frequency	16	34	62	58	26	4

(a) Calculate an estimate of the mean.

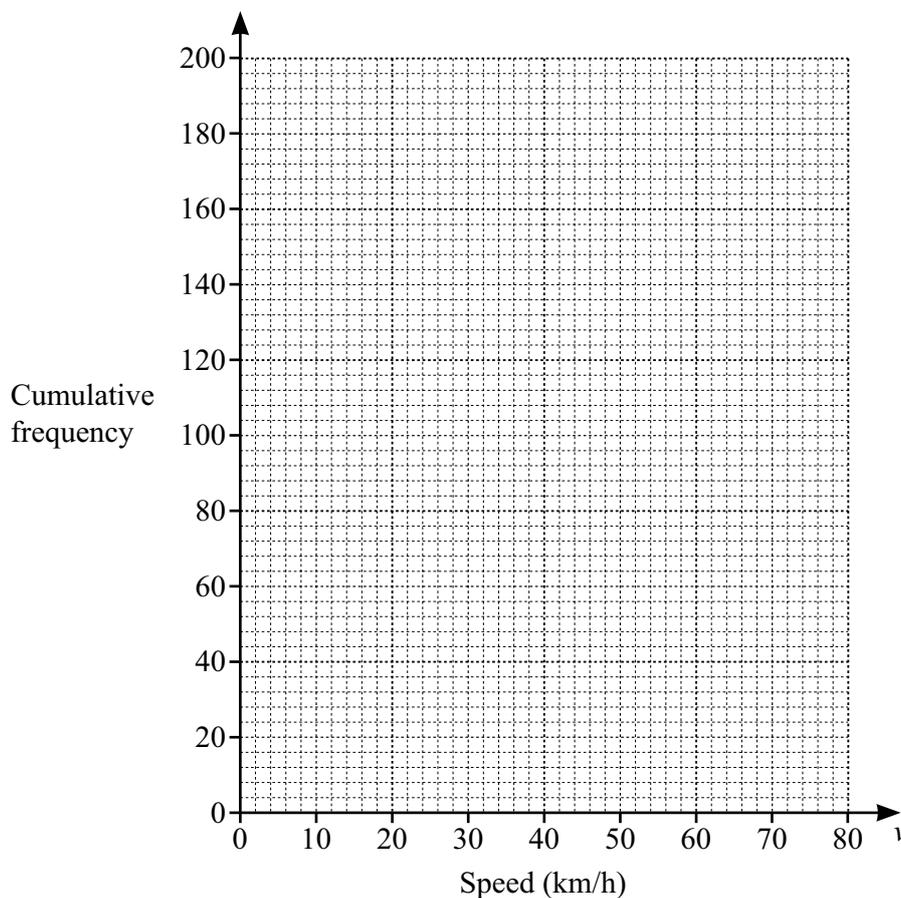
..... km/h [4]

(b) (i) Use the frequency table to complete the cumulative frequency table.

Speed ( $v$ km/h)	$v \leq 20$	$v \leq 40$	$v \leq 45$	$v \leq 50$	$v \leq 60$	$v \leq 80$
Cumulative frequency	16	50			196	200

[1]

(ii) On the grid, draw a cumulative frequency diagram.



[3]

(iii) Use your diagram to find an estimate of the upper quartile.

..... km/h [1]

(c) Two of the 200 cars are chosen at random.

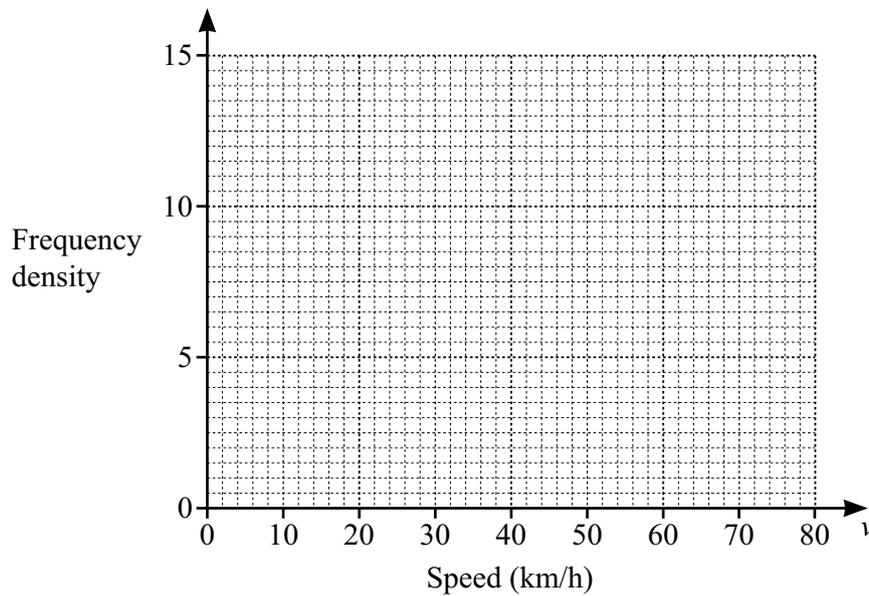
Find the probability that they both have a speed greater than 50 km/h.

..... [2]

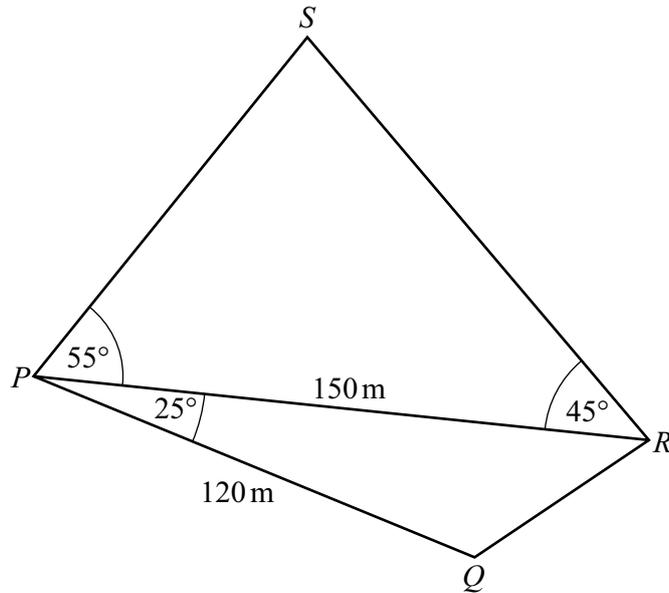
(d) A new frequency table is made by combining intervals.

Speed ( $v$ km/h)	$0 < v \leq 40$	$40 < v \leq 50$	$50 < v \leq 80$
Frequency	50	120	30

On the grid, draw a histogram to show the information in this table.



[3]



NOT TO  
SCALE

The diagram shows two triangles.

(a) Calculate  $QR$ .

$$QR = \dots\dots\dots \text{ m [3]}$$

(b) Calculate  $RS$ .

$$RS = \dots\dots\dots \text{ m [4]}$$

(c) Calculate the total area of the two triangles.

.....  $\text{m}^2$  [3]

18 (a) Complete the square for  $x^2 + 8x - 9$ .

..... [2]

(b) Use your answer to **part (a)** to solve the equation  $x^2 + 8x - 9 = 0$ .

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

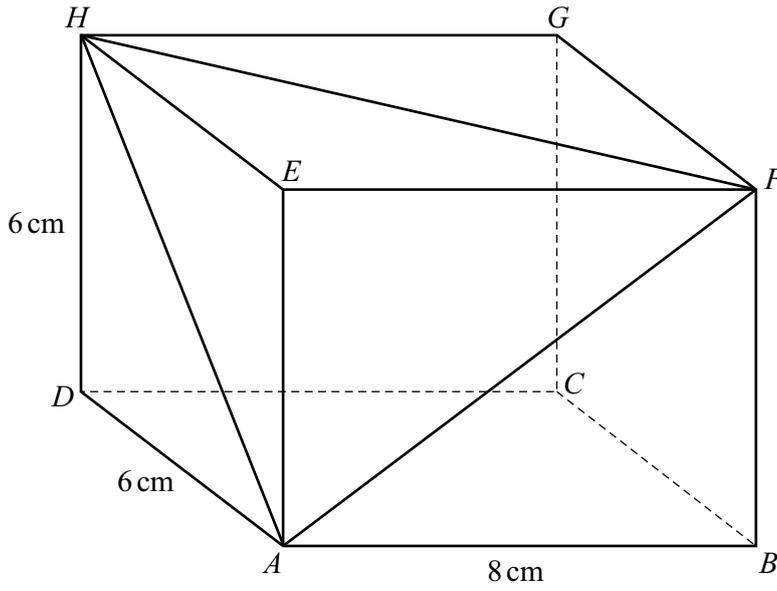
19 The solutions of the equation  $x^2 + bx + c = 0$  are  $\frac{-7 + \sqrt{61}}{2}$  and  $\frac{-7 - \sqrt{61}}{2}$ .

Find the value of  $b$  and the value of  $c$ .

$b = \dots\dots\dots$

$c = \dots\dots\dots$

[3]

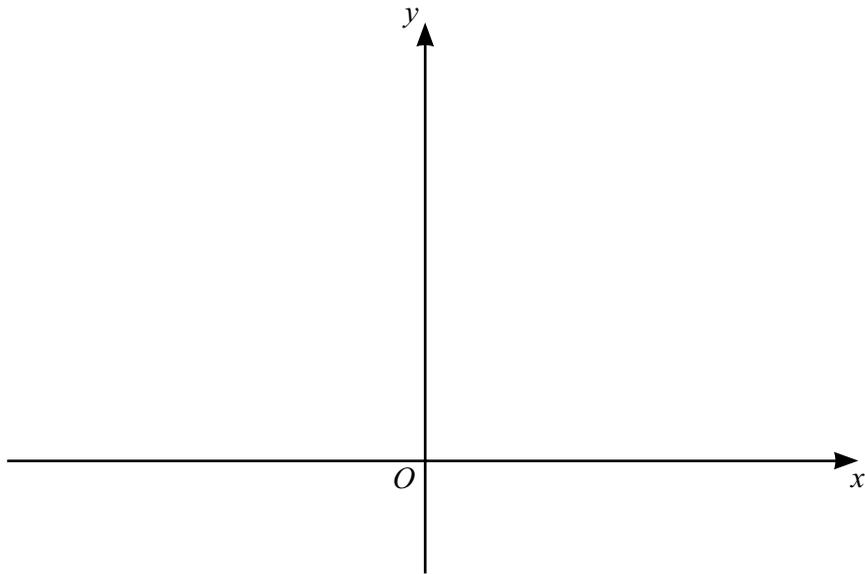


NOT TO SCALE

The diagram shows a cuboid.  
 $AB = 8 \text{ cm}$ ,  $AD = 6 \text{ cm}$  and  $DH = 6 \text{ cm}$ .

Calculate angle  $HAF$ .

Angle  $HAF = \dots\dots\dots [6]$



(a) On the diagram,

(i) sketch the graph of  $y = (x - 1)^2$  [2]

(ii) sketch the graph of  $y = \frac{1}{2}x + 1$ . [2]

- (b) The graphs of  $y = (x - 1)^2$  and  $y = \frac{1}{2}x + 1$  intersect at  $A$  and  $B$ .

Find the length of  $AB$ .

$AB = \dots\dots\dots$  [7]

22 Simplify.

$$\frac{2x^2 + x - 15}{ax + 3a - 2bx - 6b}$$

..... [5]

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