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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 π , 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 .

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

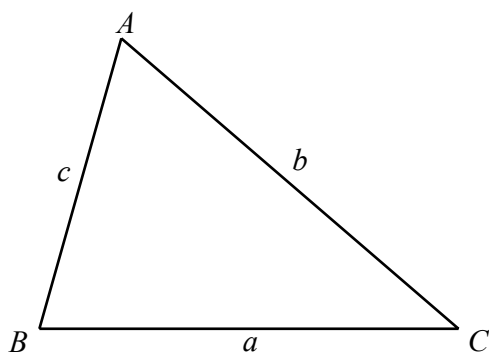
Volume, V , of sphere of radius r .

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

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,



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

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

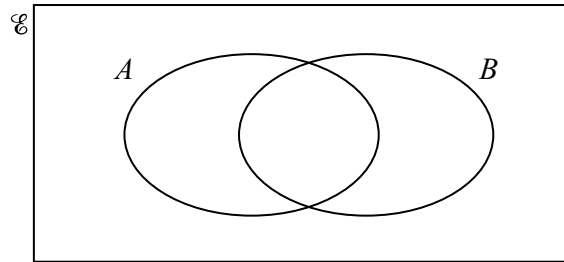
$$\text{Area} = \frac{1}{2}ab \sin C$$

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 $A \cap B$.

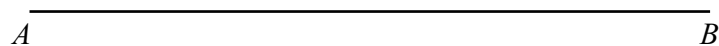
[1]

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.

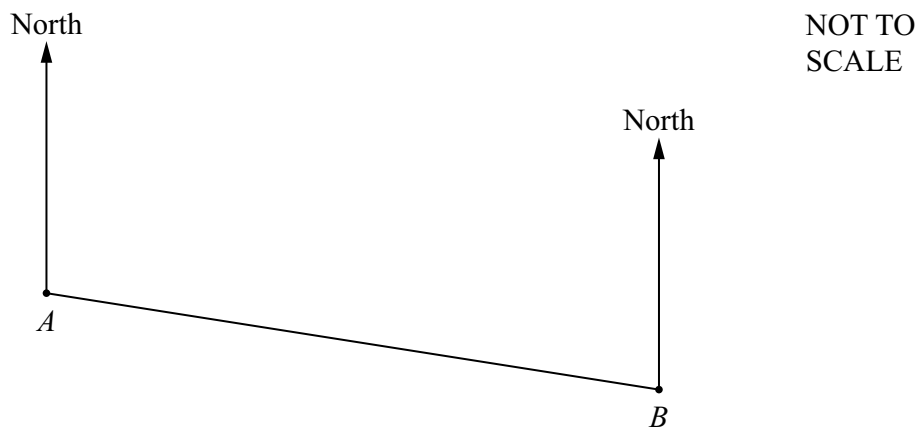
$\dots\dots\dots$ [1]

5 Simplify.

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

..... [2]

6



The bearing of B from A is 105° .

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.

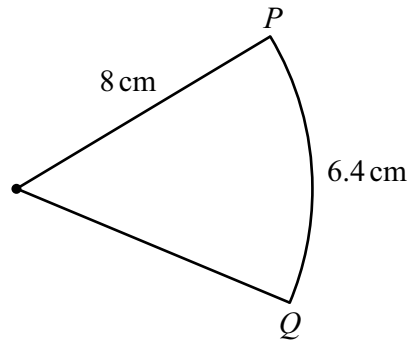
(a) $(5x^4)^3$

..... [2]

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

..... [2]

14

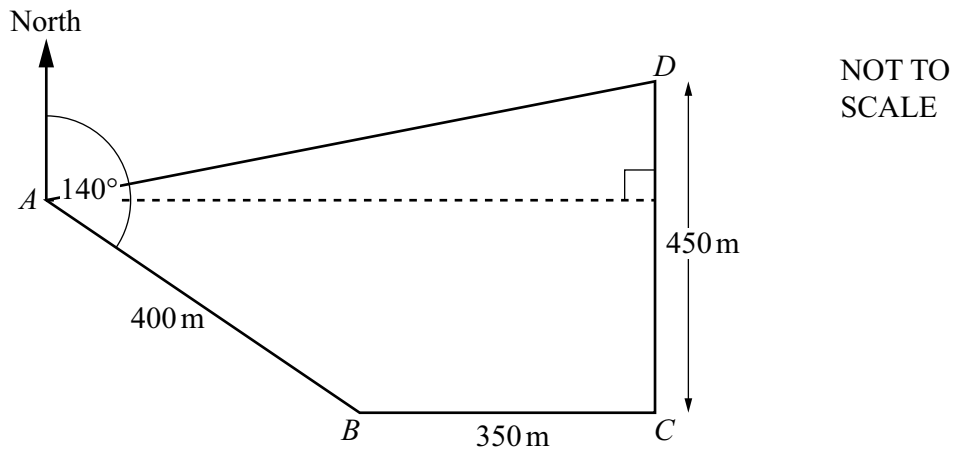
NOT TO
SCALE

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.

.....cm² [4]

15



The diagram shows a field $ABCD$.
 The bearing of B from A is 140° .
 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° , 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.

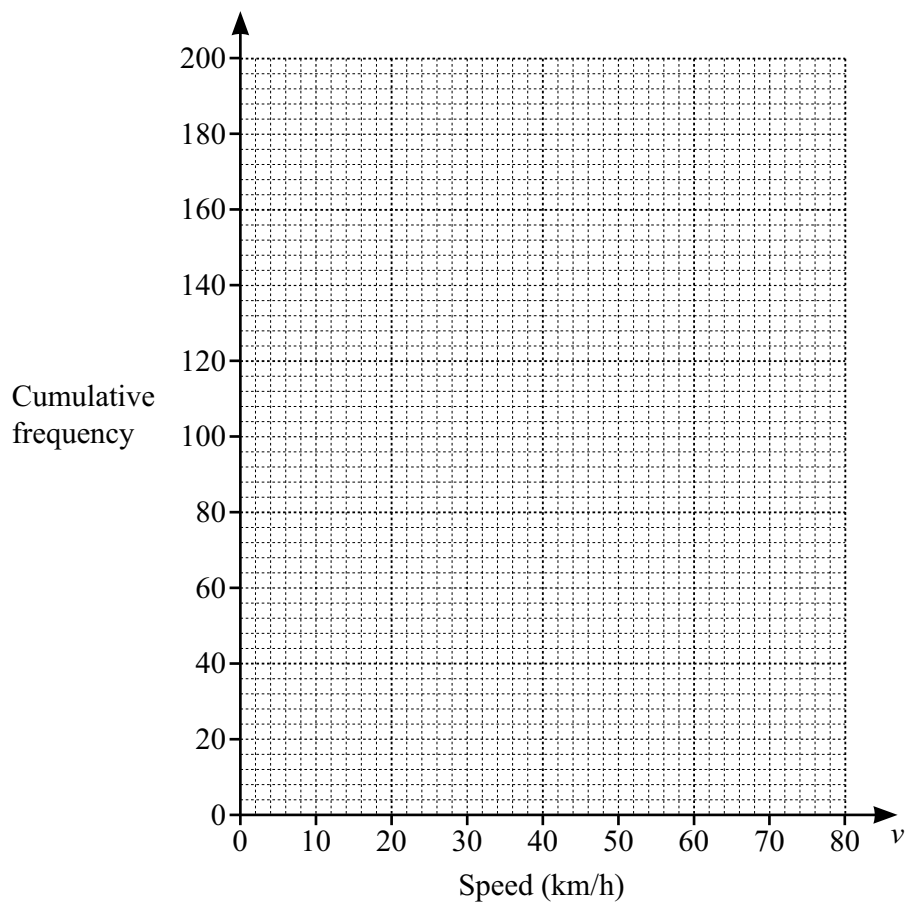
..... km/h [4]

- (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.

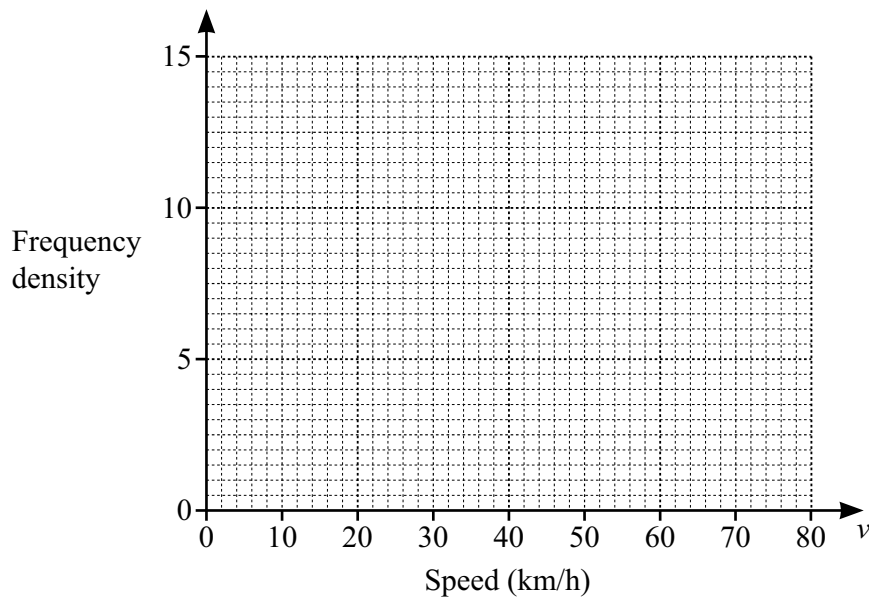
Find the probability that they both have a speed greater than 50 km/h.

..... [2]

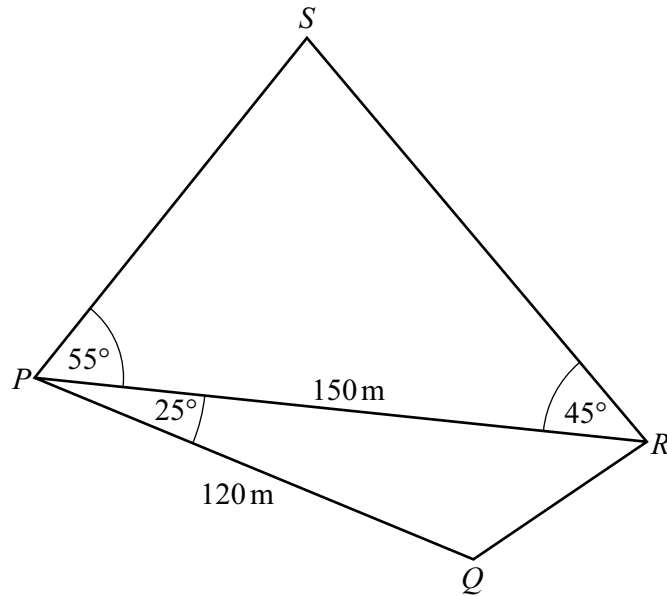
(d) A new frequency table is made by combining intervals.

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 .

$QR = \dots\dots\dots$ m [3]

(b) Calculate RS .

$RS = \dots\dots\dots$ m [4]

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

..... 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 $x^2 + 8x - 9 = 0$.

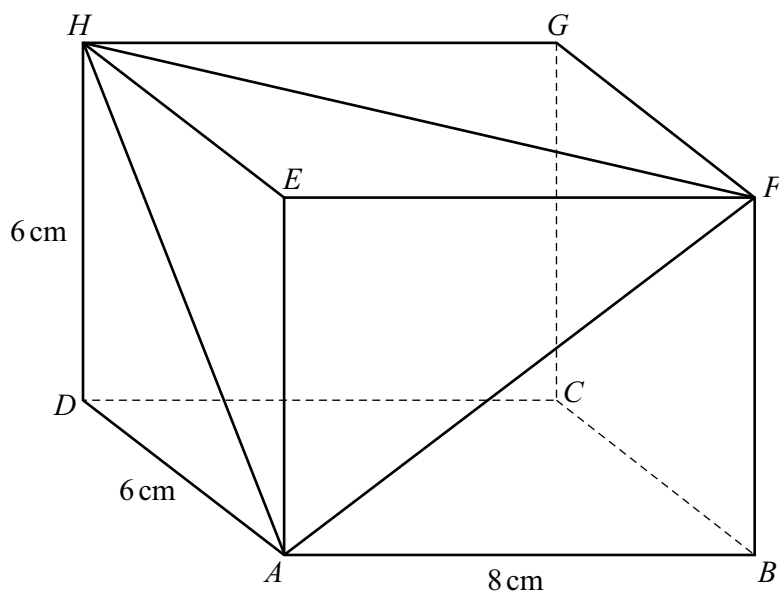
$x =$ or $x =$ [2]

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 .

$b =$

$c =$ [3]

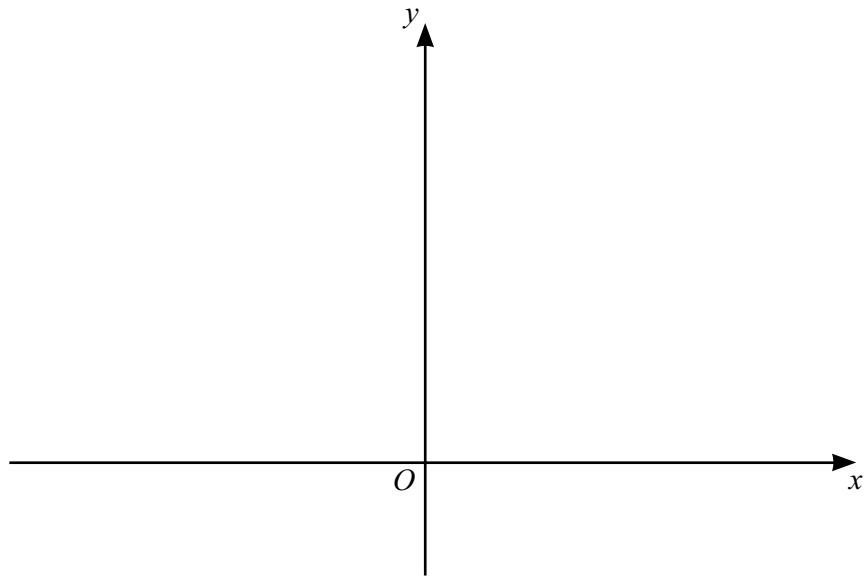


NOT TO
SCALE

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