



Cambridge IGCSE™

CANDIDATE
NAME
CENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

MATHEMATICS

0580/23

Paper 2 (Extended)

May/June 2024

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 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 70.
- The number of marks for each question or part question is shown in brackets [].

This document has **12** pages. Any blank pages are indicated.



- 1 Write the number two million two thousand and two in figures.

..... [1]

- 2 Put one pair of brackets into this calculation to make it correct.

$$5 - 4 \times 3 - 9 - 2 = 0$$

[1]

- 3 Simplify.

$$7x - 8y - x - y$$

..... [2]

- 4 The base of a cuboid measures 10 cm by 7 cm.
The volume of the cuboid is 280 cm^3 .

Calculate the height of the cuboid.

..... cm [2]

- 5 In a city, the probability that it will rain today is 0.15 .

Find the probability that it will not rain today in this city.

..... [1]

- 6 Factorise completely.

$$4x^2y - 5xy^2$$

..... [2]



- 7 The scale of a map is 1 : 40 000.
On the map the distance between two villages is 37 cm.

Calculate the actual distance between the two villages.
Give your answer in kilometres.

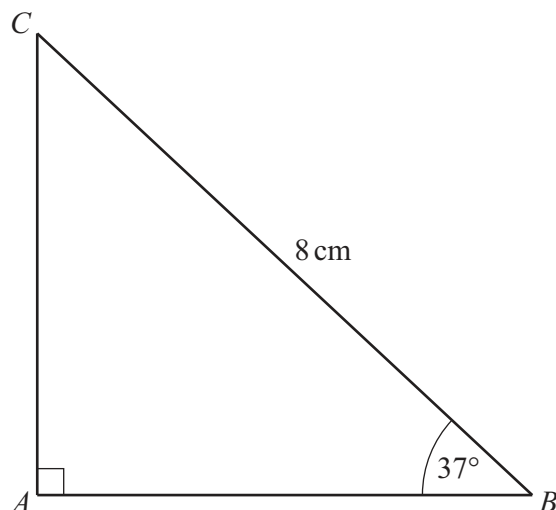
..... km [2]

- 8 Without using a calculator, work out $\frac{3}{7} - \frac{1}{14}$.

You must show all your working and give your answer as a fraction in its simplest form.

..... [2]

9



NOT TO
SCALE

The diagram shows a right-angled triangle.

Calculate AB .

$AB =$ cm [2]





- 10 Find the gradient of the line joining the points $(-2, 7)$ and $(3, 1)$.

..... [2]

- 11 Solve the simultaneous equations.

$$5t - 2w = 19$$

$$3t + 2w = 5$$

$$t = \dots\dots\dots$$

$$w = \dots\dots\dots [2]$$

- 12 Simplify.

(a) $\frac{32g^{16}}{16g^8}$

..... [2]

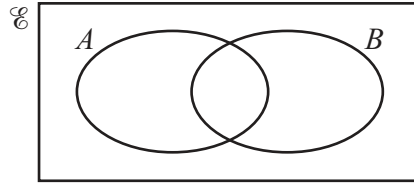
(b) $(625k^8)^{\frac{3}{4}}$

..... [2]





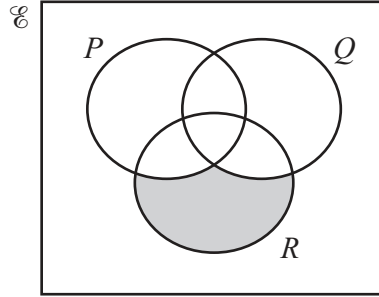
13 (a)



Shade the region $A \cup B'$.

[1]

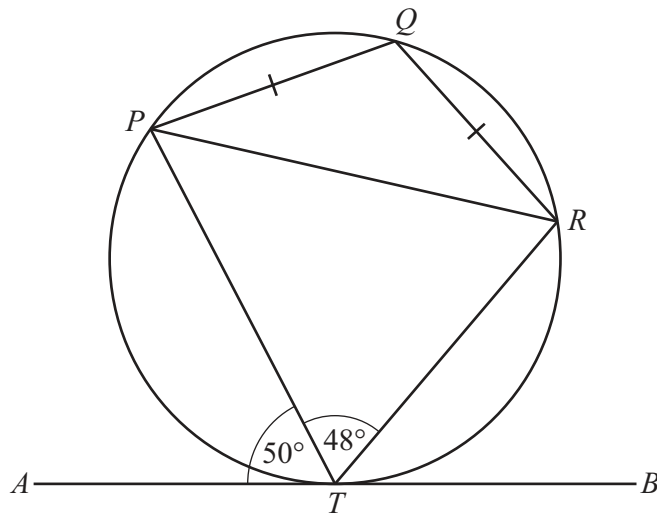
(b)



Use set notation to describe the shaded region.

..... [1]

14



NOT TO
SCALE

P, Q, R and T are points on the circle.
 AB is a tangent to the circle at T .
 Angle $ATP = 50^\circ$, angle $PTR = 48^\circ$ and $PQ = QR$.

(a) Find angle PRT .

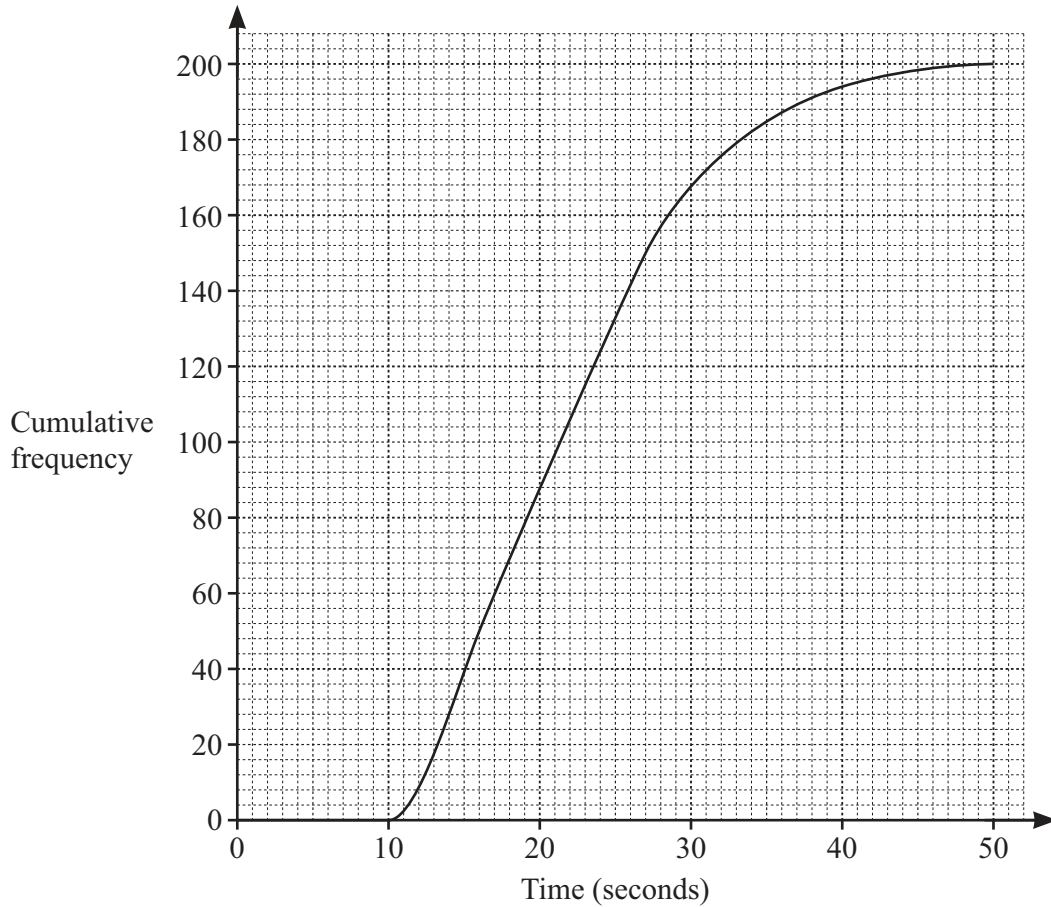
Angle $PRT =$ [1]

(b) Find angle QPR .

Angle $QPR =$ [2]

[Turn over]





The time taken for each of 200 students to complete a calculation is measured. The cumulative frequency diagram shows the results.

Use the diagram to find an estimate for

(a) the interquartile range

..... s [2]

(b) the number of students taking more than 40 seconds to complete the calculation.

..... [2]





16

$$A = \pi r^2 + \pi dh$$

Rearrange the formula to make h the subject.

$$h = \dots\dots\dots [2]$$

17 Work out, giving each answer in standard form.

(a) $(2.1 \times 10^{101}) \times (8 \times 10^{101})$

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

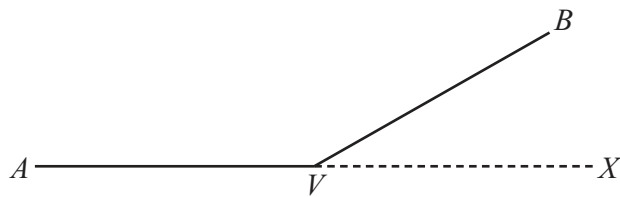
(b) $(2.1 \times 10^{101}) + (2.1 \times 10^{100})$

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





18



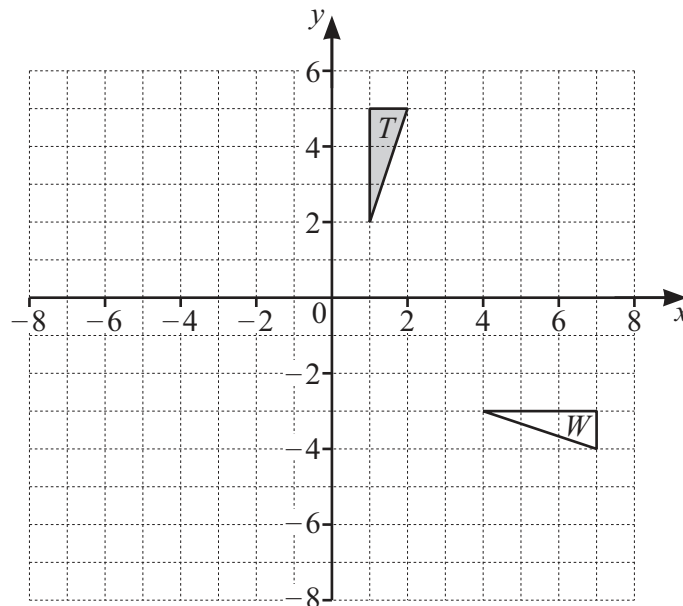
NOT TO
SCALE

The diagram shows two sides, VA and VB , of a regular polygon.
 AVX is a straight line.
 Angle $BVX = y^\circ$ and angle $AVB = 11.5y^\circ$.

Find the number of sides of this polygon.

..... [3]

19



(a) Describe fully the **single** transformation that maps triangle T onto triangle W .

.....
 [3]

(b) Draw the enlargement of triangle T with scale factor -2 and centre of enlargement $(-1, 1)$. [2]





20 $f(x) = 3^x + 2$

(a) Find x when $f(x) = 245$.

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

(b) Find x when $f^{-1}(x) = 7$.

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

21 Write the recurring decimal $0.4\dot{1}$ as a fraction in its simplest form.
You must show all your working.

$\dots\dots\dots$ [2]

22 Solve the equation $\tan x + \sqrt{3} = 0$ for $0^\circ \leq x \leq 360^\circ$.

$\dots\dots\dots$ [3]

[Turn over]



DO NOT WRITE IN THIS MARGIN



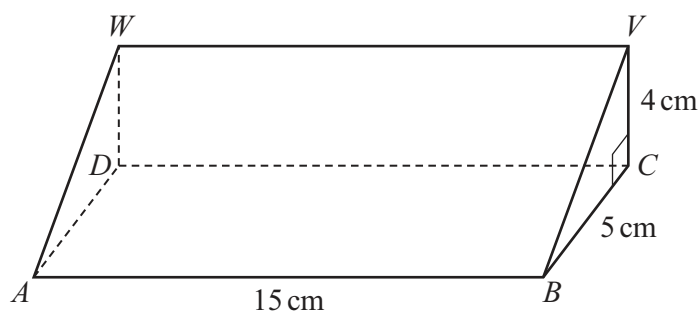
23 Simplify.

$$\frac{2}{y+1} - \frac{3}{y}$$

Give your answer as a single fraction in its simplest form.

..... [3]

24



NOT TO
SCALE

The diagram shows a triangular prism with cross-section triangle BCV .
Angle $BCV = 90^\circ$, $BC = 5\text{ cm}$, $CV = 4\text{ cm}$ and $AB = 15\text{ cm}$.

Calculate the angle between AV and the base $ABCD$.

..... [4]

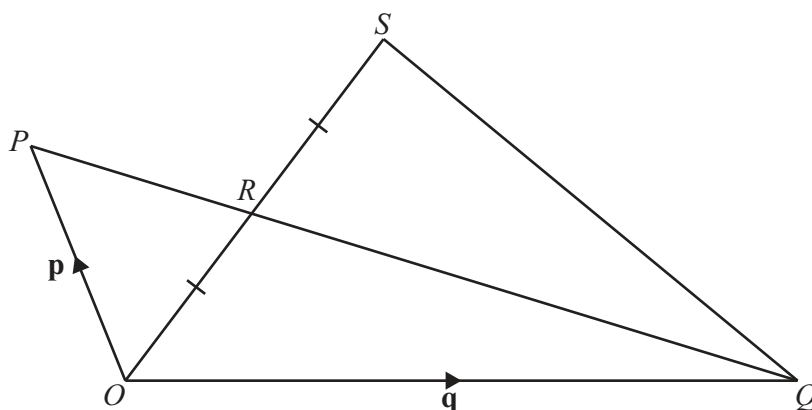


25 Simplify.

$$\frac{pt - p - t + 1}{1 - t^2}$$

..... [4]

26



NOT TO
SCALE

In the diagram, O is the origin.

$\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OQ} = \mathbf{q}$.

R is the point of intersection of PQ and OS , with $PR : RQ = 1 : 2$ and $OR = RS$.

Find the position vector of S in terms of \mathbf{p} and \mathbf{q} .

Give your answer in its simplest form.

..... [4]





Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge Assessment International Education Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge Assessment International Education is part of Cambridge Assessment. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which is a department of the University of Cambridge.

