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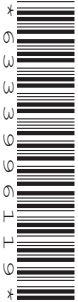
Cambridge IGCSE™

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 [ ].

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.

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

[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.
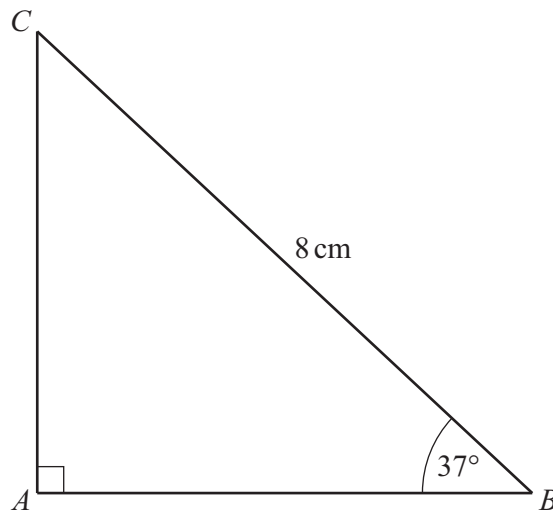Give your answer in kilometres.

.... 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

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 = $ ....

$w = $ .... [2]

12 Simplify.

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

.... [2]

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

.... [2]
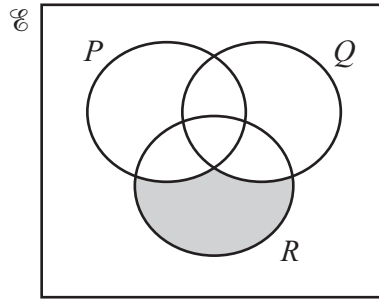
13 (a)
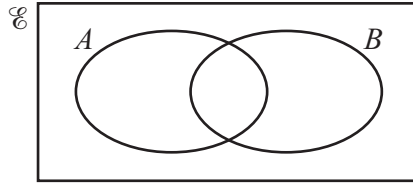
Shade the region $A \cup B'$.   [1]

(b)

Use set notation to describe the shaded region.

.... [1]

14
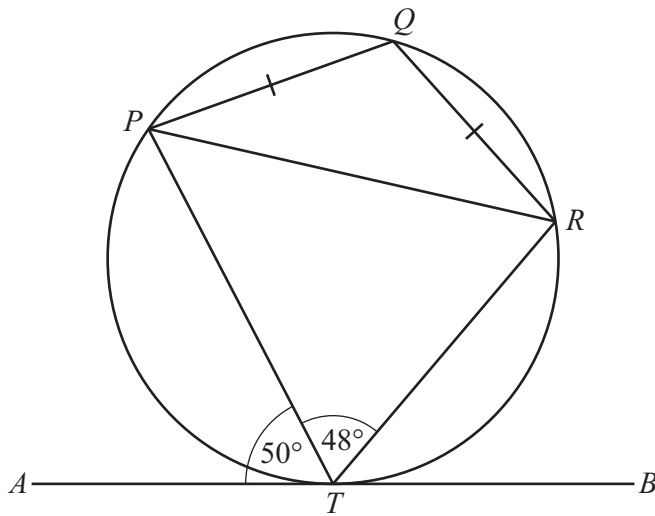
NOT TO
SCALE

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

(a) Find angle PRT.

Angle $PRT =$ .... [1]

(b) Find angle QPR.

Angle $QPR =$ .... [2]
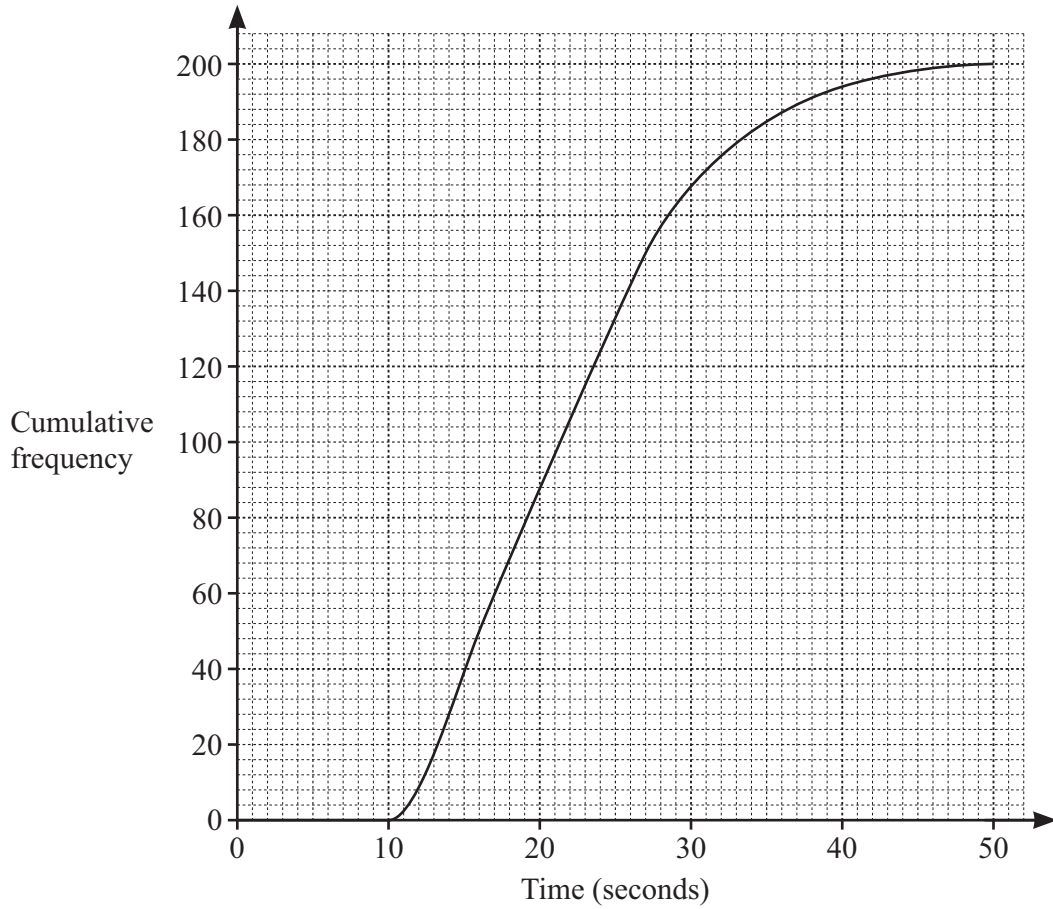
The time taken for each of 200 students to complete a calculation is measured.
The cumulative frequency diagram shows the results.

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.

$h =$ .... [2]

17 Work out, giving each answer in standard form.

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

.... [2]

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

.... [2]

18
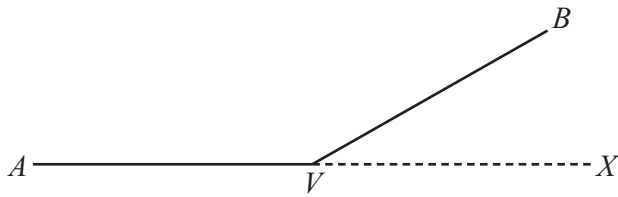
NOT TO SCALE

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

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 $\quad f(x) = 3^x + 2$

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

$x =$ .... [2]

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

$x =$ .... [2]

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

.... [2]

22 Solve the equation $\quad \tan x + \sqrt{3} = 0 \quad$ for $\quad 0° \leqslant x \leqslant 360°$.

.... [3]

23 Simplify.

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

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

.... [3]

24

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

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

.... [4]

25 Simplify.

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

.... [4]

26
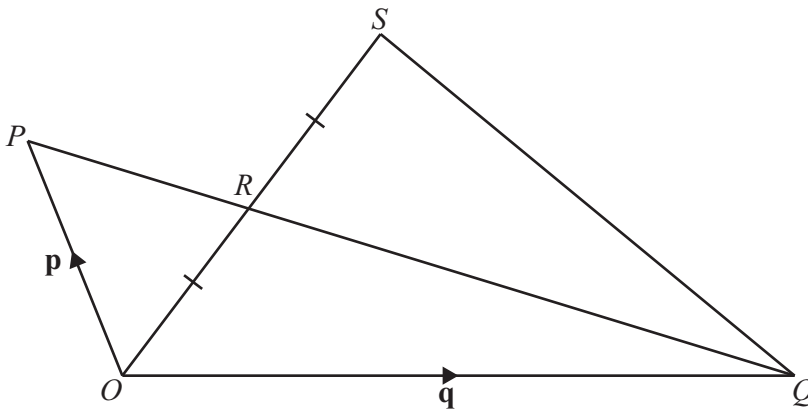
In the diagram, O is the origin.
$\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OQ} = \mathbf{q}$.
R is the point of intersection of PQ and OS, with $PR : RQ = 1 : 2$ and $OR = RS$.

Find the position vector of S in terms of $\mathbf{p}$ and $\mathbf{q}$.
Give your answer in its simplest form.

.... [4]

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