Cambridge Assessment International Education

MEM

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

3185037172

MATHEMATICS **0580/23**

Paper 2 (Extended) **October/November 2023**

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.

[Turn over

1 Tara goes on a journey by train.
The train leaves at 06 48.
The journey takes 12 hours and 35 minutes.

Find the time when Tara arrives.

..... [1]

2

61	63	64	66	68	69

From this list, write down

(a) a cube number

..... [1]

(b) a prime number.

..... [1]

3 The stem-and-leaf diagram shows the heights, in centimetres, of some plants.

10	4 8
11	1 3 4 6
12	2 3 6 9
13	2 6 9

Key: 10 | 4 represents 10.4 cm

(a) Find the median height.

..... cm [1]

(b) Work out the mean height.

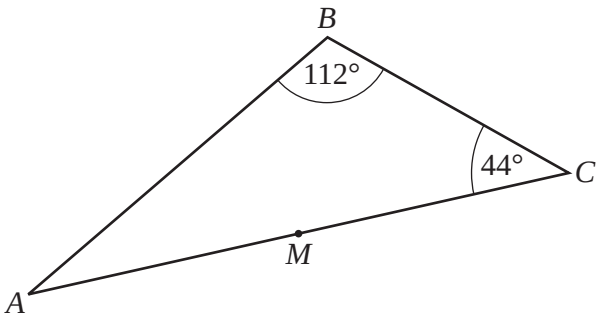
..... cm [2]

4 Shubhu invests $750 in a savings account for 5 years.
The account pays simple interest at a rate of 1.8% per year.

Calculate the total interest she earns during the 5 years.

$ ..... [2]

5



NOT TO SCALE

The diagram shows triangle *ABC*.
M is the midpoint of *AC*.

Triangle *ABC* is rotated 180° about centre *M*.
The image and the original triangle together form a quadrilateral *ABCD*.

(a) Write down the mathematical name of the quadrilateral *ABCD*.

..... [1]

(b) Find angle *BAD*.

Angle *BAD* = ... [2]

6 Rama asks a group of students how they travel to school.
The table shows the probability of how a student, chosen at random, travels to school.

	Bus	Walk	Car	Other
Probability	0.4	0.32	0.17	

(a) Complete the table.

[2]

(b) There are 1800 students at the school.

Find the expected number of students that walk to school.

..... [1]

7 **Without using a calculator**, work out $1\frac{5}{6} \div \frac{11}{15}$.

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

..... [3]

8 Find the highest common factor (HCF) of 48 and 80.

..... [2]

9 $P = \dfrac{2wy^2}{3}$

Find the positive value of y when $P = 108$ and $w = 8$.

$y =$ ..... [3]

10 $\overrightarrow{AB} = \begin{pmatrix} 7 \\ -3 \end{pmatrix}$

(a) Find $3\overrightarrow{AB}$.

$\begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

(b) Find $\left|\overrightarrow{AB}\right|$.

$\left|\overrightarrow{AB}\right| =$ ..... [2]

11 A bronze sphere has radius 3.6 cm.
The density of bronze is 8.05 g/cm^3.

Find the mass of the sphere.
Give your answer **in kilograms**, correct to the nearest gram.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

[Density = mass ÷ volume.]

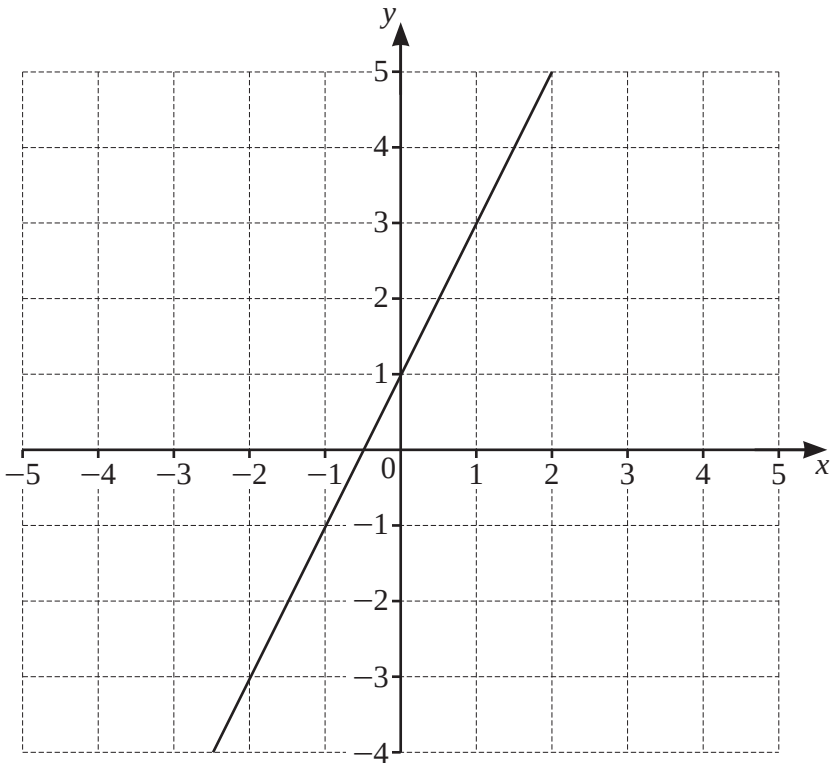
..... kg [4]

12 Oliver sent 22% more messages in June than in May.
He sent 305 messages in June.

Find how many more messages he sent in June than in May.

..... [3]

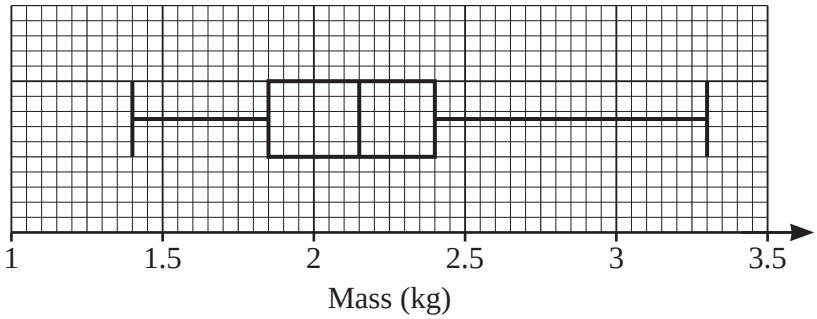
13 The graph of $y = 2x + 1$ is drawn on the grid.



By shading the **unwanted** regions of the grid, find and label the region R which satisfies these inequalities.

$y \geqslant 2x + 1$ $y \geqslant 1$ $4x + 3y < 12$ [4]

14 The box-and-whisker plot shows information about the mass, in kg, of some parcels.



(a) Find the mass of the heaviest parcel.

..... kg [1]

(b) Find the interquartile range.

..... kg [1]

15 $T = \sqrt{3d - e}$

Rearrange the formula to make d the subject.

$d =$ ..... [3]

16 A cylinder with height 12.5 cm has a curved surface area of 105π cm^2.

Calculate the volume of the cylinder.

..... cm^3 [4]

17 **(a)** Simplify.

$$\left(64y^{27}\right)^{\frac{2}{3}}$$

..... [2]

(b) Simplify.

$$\frac{x-5}{x^2-25}$$

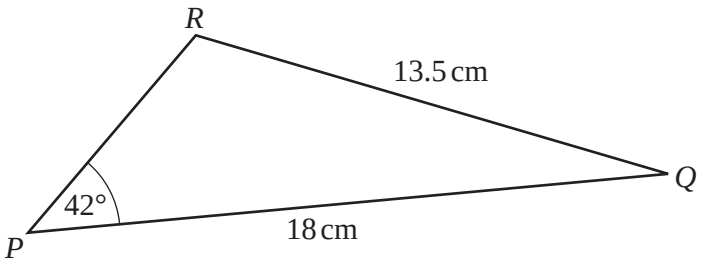
..... [2]

18 F is proportional to the product of m and a.

Calculate the percentage change in F when m is increased by 40% and a is decreased by 15%.

..... % [3]

19



NOT TO SCALE

Calculate the obtuse angle PRQ.

Angle PRQ = ... [4]

20 $(x+a)(x+2)(2x+3)$ is equivalent to $2x^3+bx^2+cx-18$.

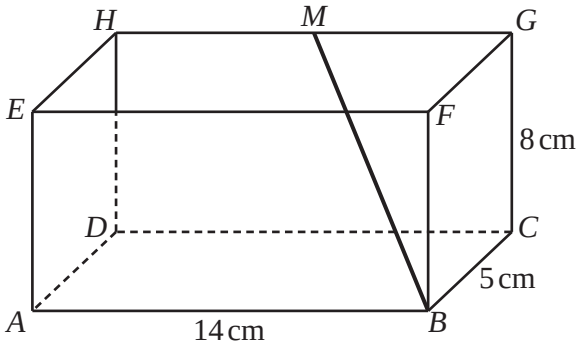
Find the value of each of a, b and c.

$a =$ .....

$b =$ .....

$c =$ ..... [3]

21



NOT TO SCALE

The diagram shows a cuboid $ABCDEFGH$.
$AB = 14$ cm, $BC = 5$ cm and $CG = 8$ cm.
M is the midpoint of HG.

(a) Calculate BM.

..... cm [3]

(b) Calculate the angle that BM makes with the base $ABCD$.

..... [3]

Question 22 is printed on the next page.

22 Find the coordinates of the point where the line $4x+y=9$ intersects the curve $y+x^2=5$.
You must show all your working.

(..... , ...) [5]