Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

8963152964

MATHEMATICS **0580/23**

Paper 2 (Extended) **May/June 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.

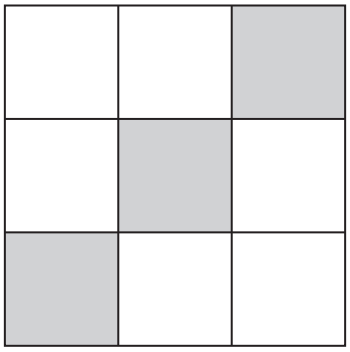
INFORMATION

- 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. Any blank pages are indicated.

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1



(a) Complete the statement.

The diagram has rotational symmetry of order ..... . [1]

(b) On the diagram, draw all the lines of symmetry.

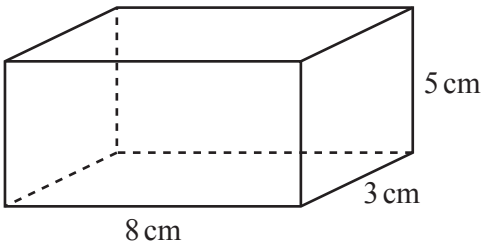
[2]

2 A film lasts for 2 hours 50 minutes.
The film ends at 23 05.

Find the time the film starts.

..... [1]

3



NOT TO SCALE

Find the total surface area of the cuboid.

..... cm^2 [3]

4 $v = u - 9.8t$

Find the value of v when $u = 4$ and $t = -7$.

$v =$ ..... [2]

5 Simplify $d^8 \div d^2$.

..... [1]

6 At the end of the day, a shopkeeper has 12 tins of cat food left.
This is $\frac{3}{13}$ of the number he had at the beginning of the day.

Calculate the number of tins he had at the beginning of the day.

..... [2]

7 A spinner has five sides.
Each side is painted red, blue, green, yellow or orange.
The table shows some of the probabilities of the spinner landing on each colour.

Colour	Red	Blue	Green	Yellow	Orange
Probability	0.3	0.16	0.18	0.25	

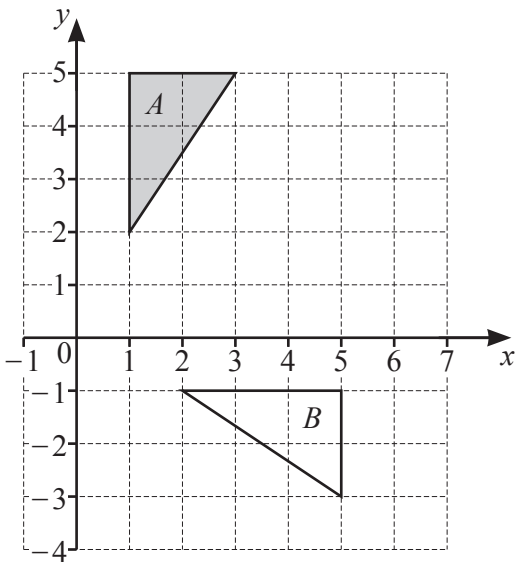
(a) Complete the table. [2]

(b) Dan spins the spinner once.

Find the probability that the spinner lands on red or blue.

..... [2]

8

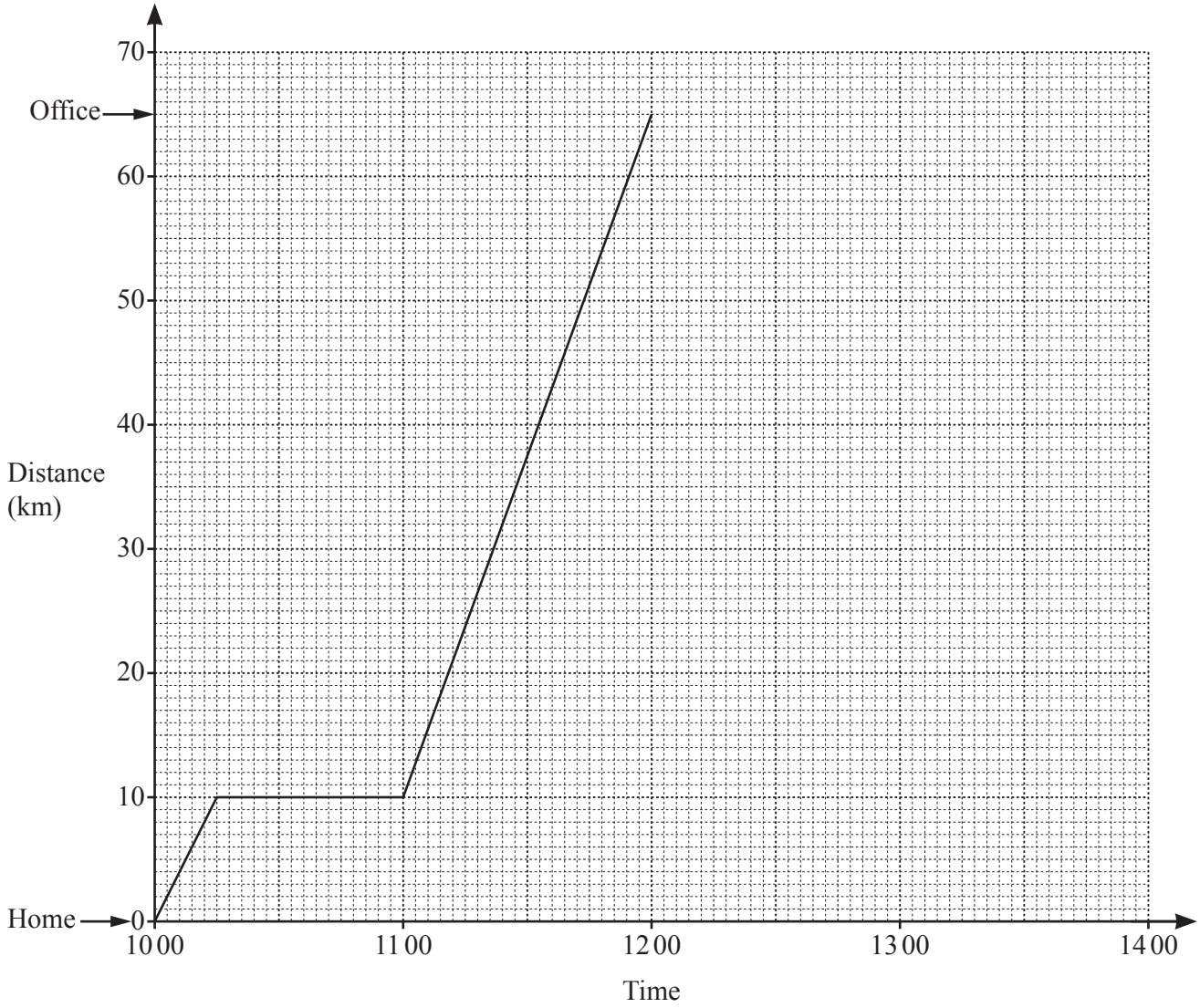


Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

.....

..... [3]

9 The distance–time graph shows information about Kai's journey from home to the office.



(a) Calculate the average speed, in km/h, for Kai's journey from home to the office.

..... km/h [2]

(b) When Kai arrives at the office, he finds his meeting is cancelled. He immediately returns home at a constant speed of 50 km/h.

Complete the distance–time graph to show his journey home. [1]

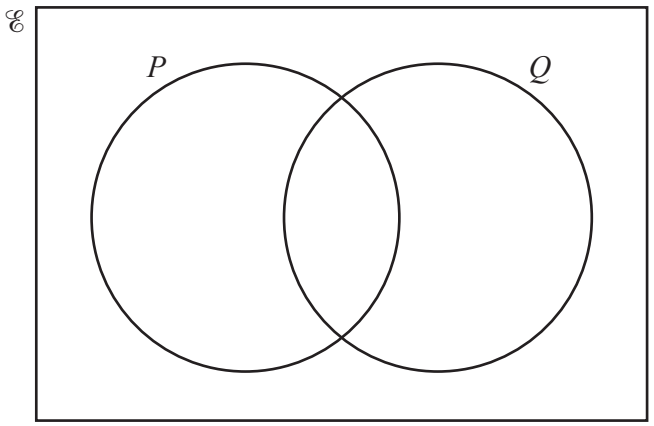
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10 **Without using a calculator**, work out $5\frac{11}{12}+2\frac{1}{4}$.

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

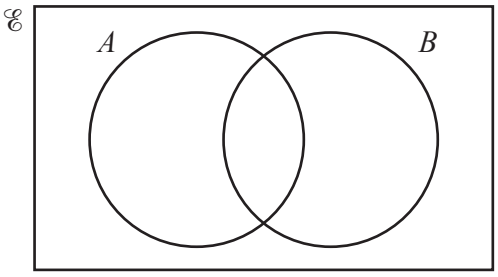
..... [3]

11 **(a)** $\mathscr{E} = \{ a,\ b,\ e,\ g,\ l,\ m,\ o,\ r,\ t,\ y \}$
$P = \{ a,\ b,\ e,\ g,\ l,\ r \}$
$Q = \{ e,\ g,\ m,\ o,\ r,\ t,\ y \}$



Complete the Venn diagram. [2]

(b)



Shade the region $A' \cap B$. [1]

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12 The position vector of A is $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$ and $\overrightarrow{BA} = \begin{pmatrix} 4 \\ 8 \end{pmatrix}$.

Show that $\left|\overrightarrow{OB}\right| = 5.1$, correct to 1 decimal place.

[3]

13 Calculate $\sqrt{42} + 3^{0.4}$.

..... [1]

14 Write $0.5\dot{8}\dot{1}$ as a fraction.
You must show all your working and give your answer in its simplest form.

..... [3]

15 The number of trees in a forest is decreasing exponentially at a rate of 1.75% per year.
Eleven years ago there were 980 trees.

Calculate the number of trees in the forest now.
Give your answer correct to the nearest integer.

..... [2]

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[Turn over

16 The volume of a cylinder is $1970\,\text{cm}^3$.
The height of the cylinder is $12.8\,\text{cm}$.

Calculate the radius of the cylinder.

..... cm [3]

17 Rearrange the formula to make m the subject.

$$R = \frac{2(m-k)}{m}$$

$m =$ ..... [4]

18 y is inversely proportional to the cube root of $(x + 5)$.
When $x = 3$, $y = 12$.

Find y when $x = 22$.

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

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19 Solve the equation $x^2 + 5x - 7 = 0$.
You must show all your working and give your answers correct to 2 decimal places.

$x =$ ..... or $x =$ ..... [4]

20 $f(x) = 6x - 7$ $g(x) = x^{-3}$

(a) Find $f(x+2)$.
Give your answer in its simplest form.

..... [2]

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

$f^{-1}(x) =$ ..... [2]

(c) Find x when $g(x) = f(22)$.

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

21 Simplify.

$$\frac{2x^2+5x-12}{4x^2-9}$$

..... [4]

22 These are the first four terms of a sequence.

2.75 6 11.25 20

The nth term of this sequence is $\frac{1}{4}n^3+an^2+bn$.

Calculate the value of a and the value of b.

$a =$ .....

$b =$ ..... [5]

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23 A train travels between two stations.
The distance between the stations is 220 km, correct to the nearest kilometre.
The speed of the train is 125 km/h, correct to the nearest 5 km/h.

Calculate the upper bound for the time the journey takes.
Give your answer in hours and minutes.

..... h ..... min [4]

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