Cambridge Assessment International Education

MEM

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0516700403

MATHEMATICS **0580/21**

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.

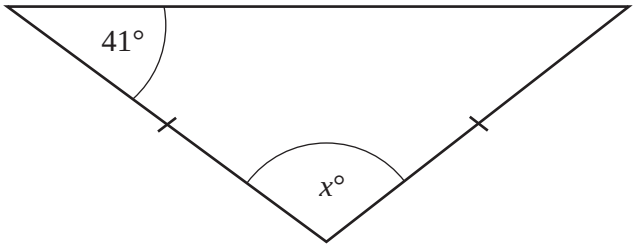
INFORMATION

- 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 The diagram shows an isosceles triangle.



NOT TO SCALE

Find the value of x.

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

2 The stem-and-leaf diagram shows the time, in minutes, it takes each of 15 people to complete a race.

1	6 6 7
2	1 3 3 4 5 6 7 7 7
3	0 1 1

Key: 1 | 6 represents 16 minutes

Find

(a) the mode

..... min [1]

(b) the range

..... min [1]

(c) the median.

..... min [1]

3 Complete these statements.

(a) When $x =$ ..... , $x+3=8$.

[1]

(b) When $7y = 63$, $10y =$ .....

[1]

4 The table shows some information about Amir's shopping.

Fruit	Cost per kilogram	Number of kilograms Amir buys	Cost
Oranges	\$2.35	3.2	\$.....
Bananas	\$.....	2.8	\$.....
		Total	\$13.54

Complete the table.

[3]

5 Factorise completely.

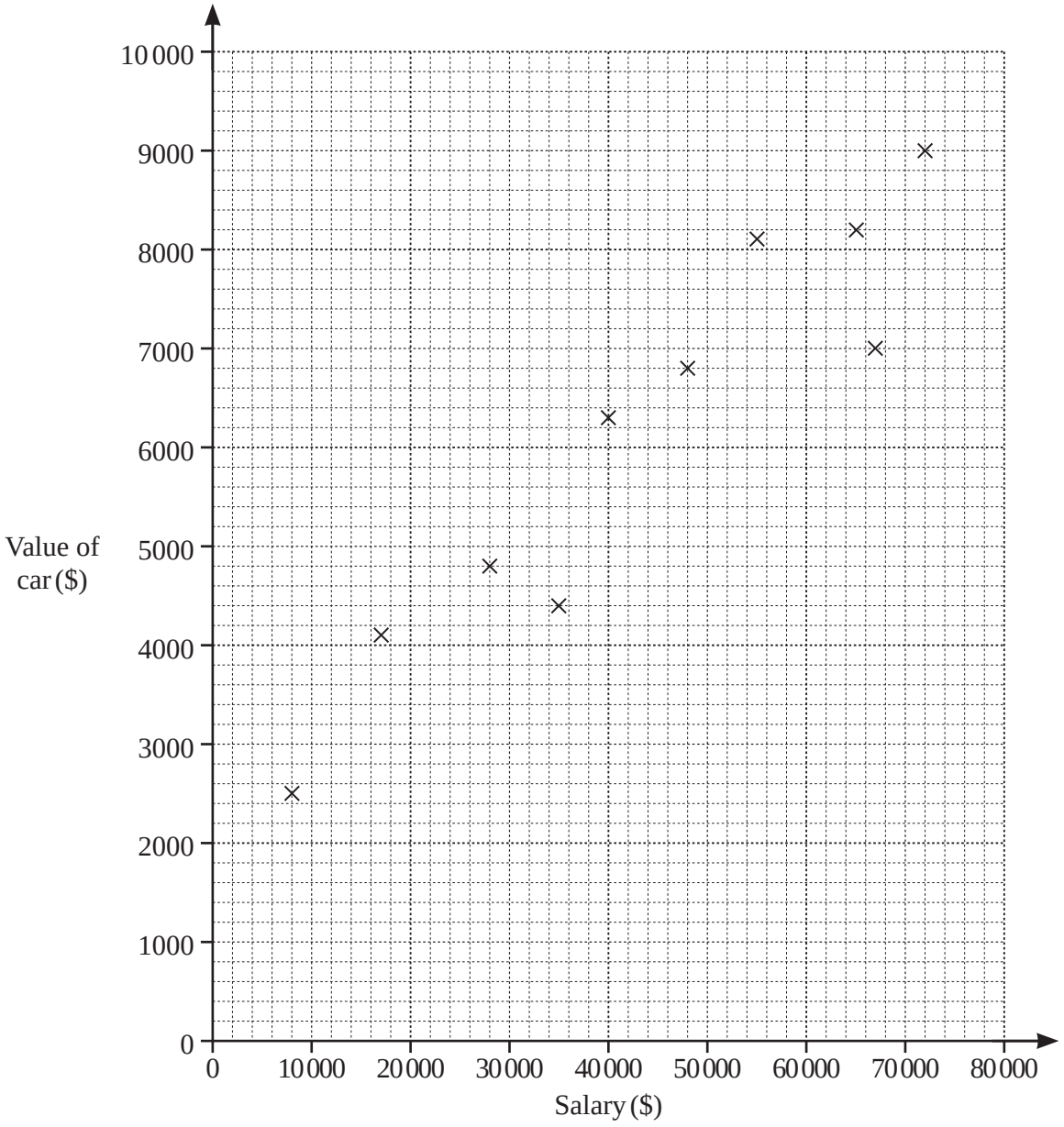
(a) $42mk - 35m$

..... [2]

(b) $h^2 - 144$

..... [1]

6 For each of 10 people working in an office, the scatter diagram shows their salary and the value of their car.



(a) One of these people has a salary of $28 000.

Find the value of their car.

$ ..... [1]

(b) Another person starts to work in the office.
Their salary is $54 000 and the value of their car is $6100.

Plot this information on the scatter diagram. [1]

(c) What type of correlation is shown in the scatter diagram?

..... [1]

7 The exchange rate between Singapore dollars and euros is 1 Singapore dollar = 0.62 euros.

Find the value of 161.20 euros in Singapore dollars.

..... Singapore dollars [1]

8 Calculate.

$$7\frac{3}{11} \times 3\frac{3}{10}$$

..... [1]

9 Find the highest common factor (HCF) of 140 and 126.

..... [2]

10 Simplify.

(a) $n^5 \times n$

..... [1]

(b) $8x^6 \div 2x^2$

..... [2]

(c) $(243y^{20})^{\frac{2}{5}}$

..... [2]

11 Solve.

$$4(2x-3) \geqslant 43+3x$$

..... [3]

12 Write $0.4\dot{2}$ as a fraction in its simplest form.
You must show all your working.

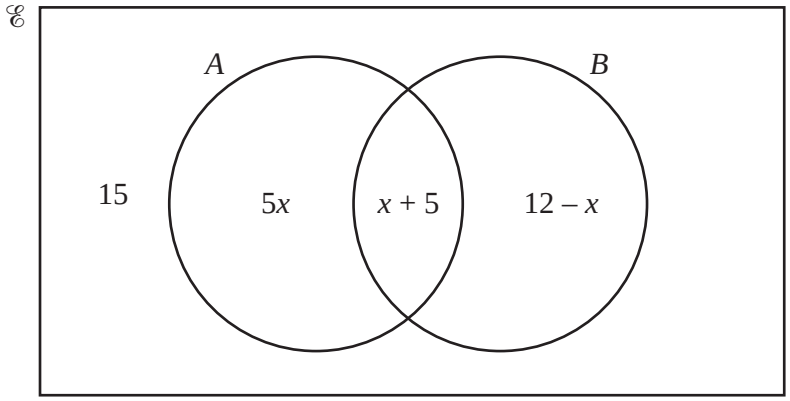
..... [3]

13 At the end of 2021 there were 27 000 rhinos living in the wild.
The number of rhinos is expected to decrease exponentially by 3% each year.

Work out the number of rhinos expected to be living in the wild 4 years later, at the end of 2025.
Give your answer correct to the nearest whole number.

..... [3]

14 (a)

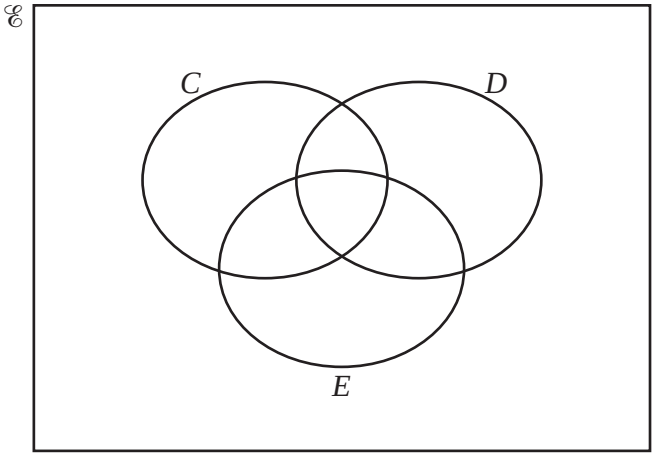


The Venn diagram shows information about the number of elements in sets A, B and $\mathscr{E}$.
$n(\mathscr{E}) = 52$.

Find $n(A \cap B)$.

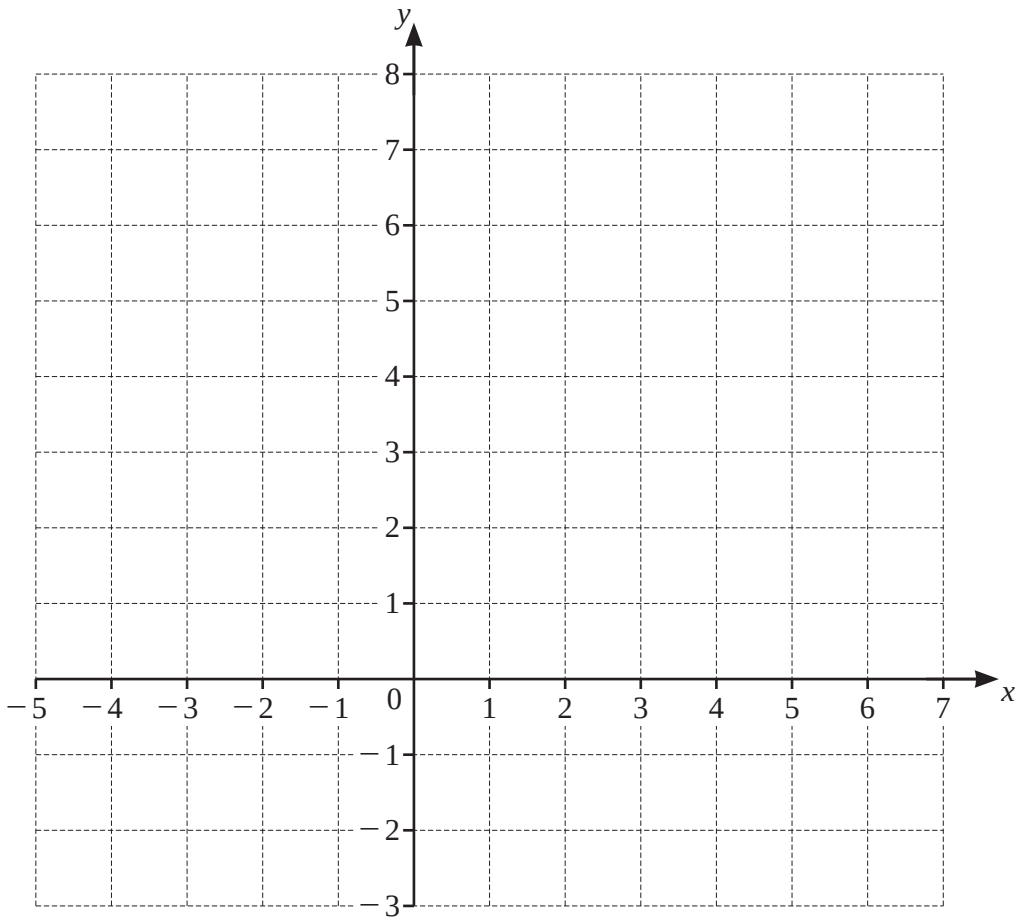
..... [3]

(b) In this Venn diagram, shade the region $C \cap D \cap E$.



[1]

15



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

$y > 1$ $x \leqslant 2$ $y \geqslant x + 2$

[5]

16 $P = 2w + 2h$

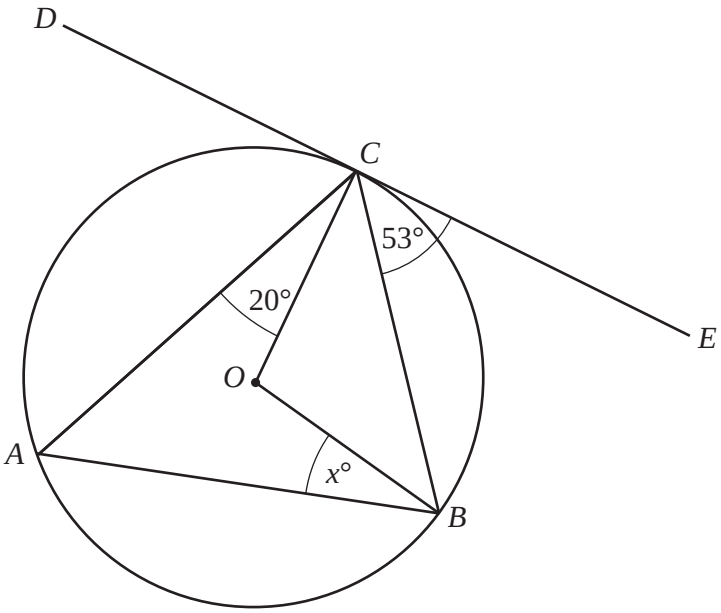
$w = 11$ and $h = 9.5$, both correct to 2 significant figures.

Find the lower bound and the upper bound for P.

Lower bound = ...

Upper bound = ... [3]

17



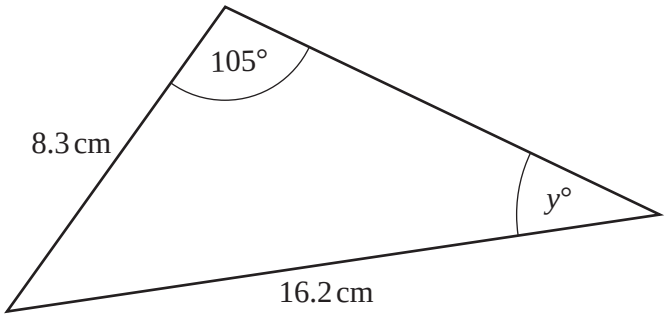
NOT TO SCALE

A, *B* and *C* are points on the circumference of a circle, centre *O*.
Tangent *DE* touches the circle at *C*.
Angle *BCE* = 53° and angle *ACO* = 20°.

Find the value of *x*.

x = ... [3]

18



NOT TO SCALE

Calculate the value of *y*.

y = ... [3]

19 **(a)**

Sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$.

[2]

(b) When $\cos x = 0.21$, find the **reflex** angle x.

..... [2]

20 Write as a single fraction in its simplest form.

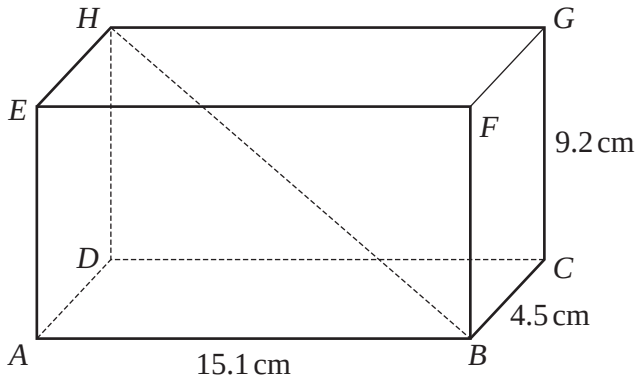
(a) $\dfrac{10x^2 - 60x}{x^2 - x - 30}$

..... [3]

(b) $\dfrac{7}{x+3} + \dfrac{5}{8x-1}$

..... [3]

21



NOT TO SCALE

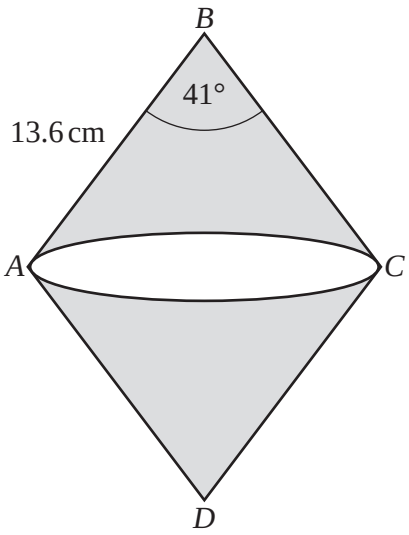
The diagram shows a cuboid $ABCDEFGH$.
$AB = 15.1$ cm, $BC = 4.5$ cm and $CG = 9.2$ cm.

Calculate the angle that the diagonal BH makes with the face $ADHE$.

..... [4]

Question 22 is printed on the next page.

22



NOT TO SCALE

ABCD is a rhombus with side length 13.6 cm.
Angle *ABC* = 41°.
BAC is a sector of a circle with centre *B*.
DAC is a sector of a circle with centre *D*.

Calculate the shaded area.

..... cm^2 [4]