Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

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

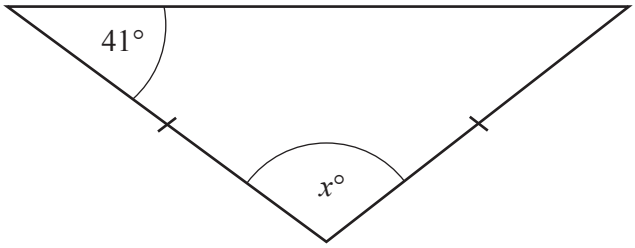
- The total mark for this paper is 70.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **12** pages.

© UCLES 2023

1 The diagram shows an isosceles triangle.

View solution



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

View solution

..... min [1]

(b) the range

View solution

..... min [1]

(c) the median.

View solution

..... min [1]

© UCLES 2023

3 Complete these statements.

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

View solution

[1]

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

View solution

[1]

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

View solution

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) $42mk - 35m$

View solution

..... [2]

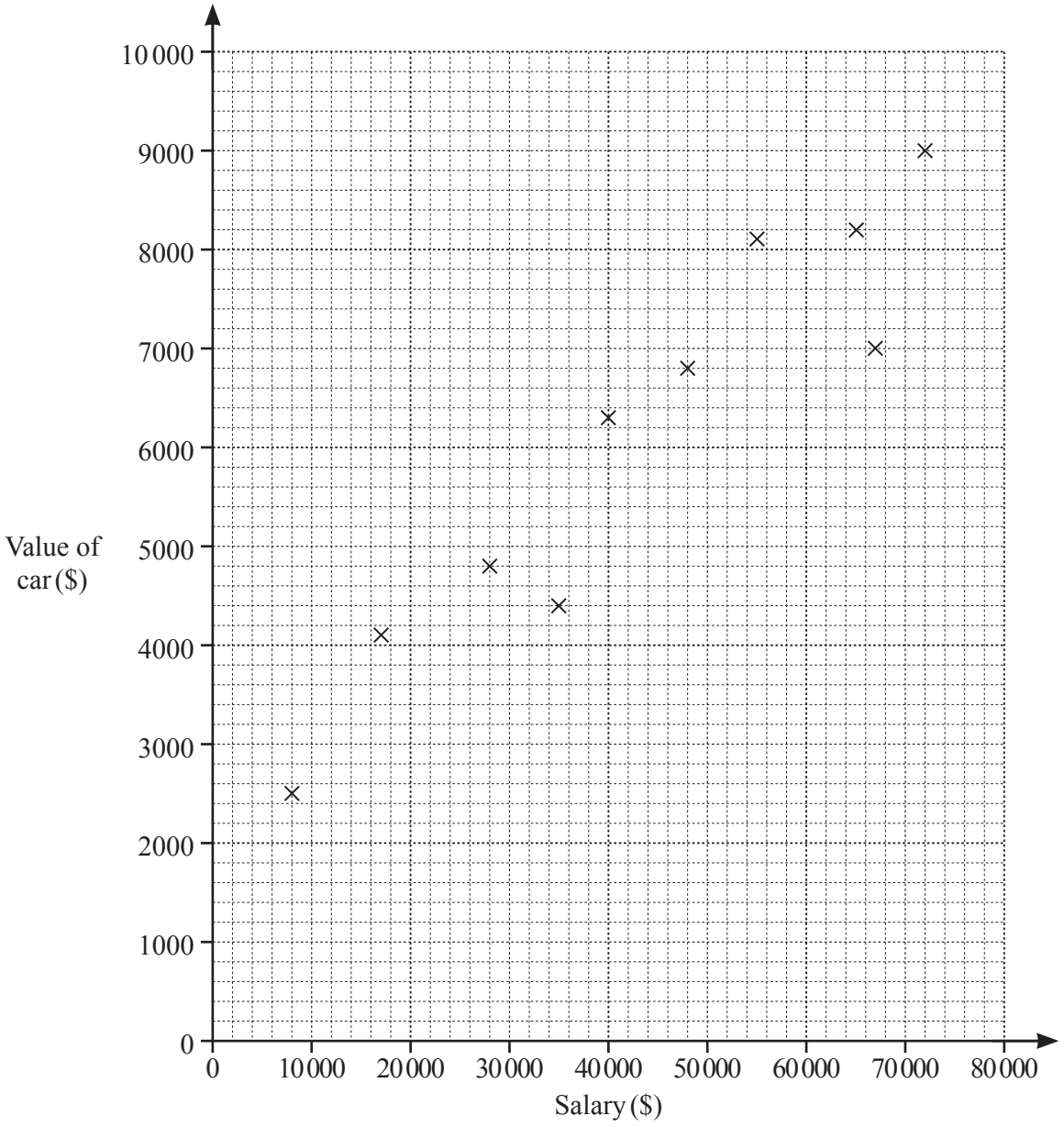
(b) $h^2 - 144$

View solution

..... [1]

© UCLES 2023

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.

View solution

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.

View solution

Plot this information on the scatter diagram. [1]

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

..... [1]

View solution

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.

View solution

..... Singapore dollars [1]

8 Calculate.

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

View solution

..... [1]

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

View solution

..... [2]

10 Simplify.

(a) $n^5 \times n$

View solution

..... [1]

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

View solution

..... [2]

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

View solution

..... [2]

© UCLES 2023

11 Solve.

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

View solution

..... [3]

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

View solution

..... [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.

View solution

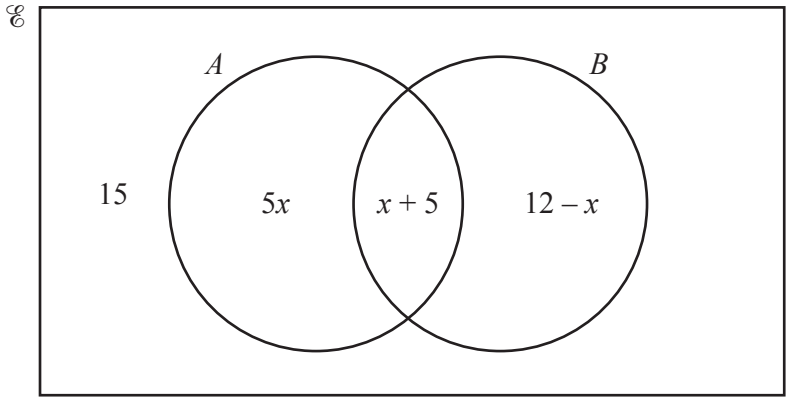
Work out the number of rhinos expected to be living in the wild 4 years later, at the end of 2025.
Give your answer correct to the nearest whole number.

..... [3]

© UCLES 2023

14 (a)

View solution



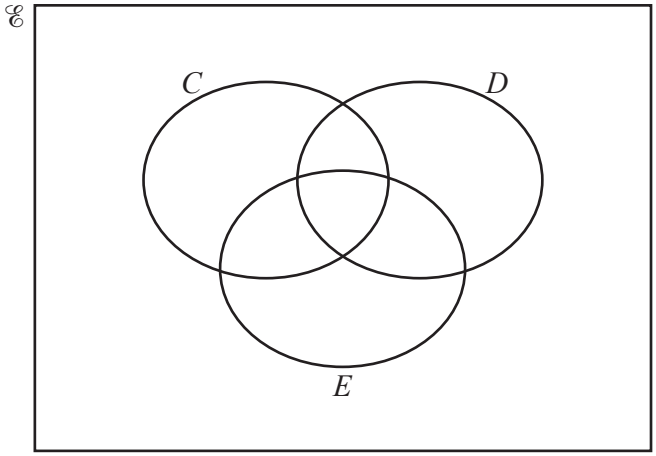
The Venn diagram shows information about the number of elements in sets A, B and $\mathscr{E}$.
$n(\mathscr{E}) = 52$.

Find $n(A \cap B)$.

..... [3]

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

View solution

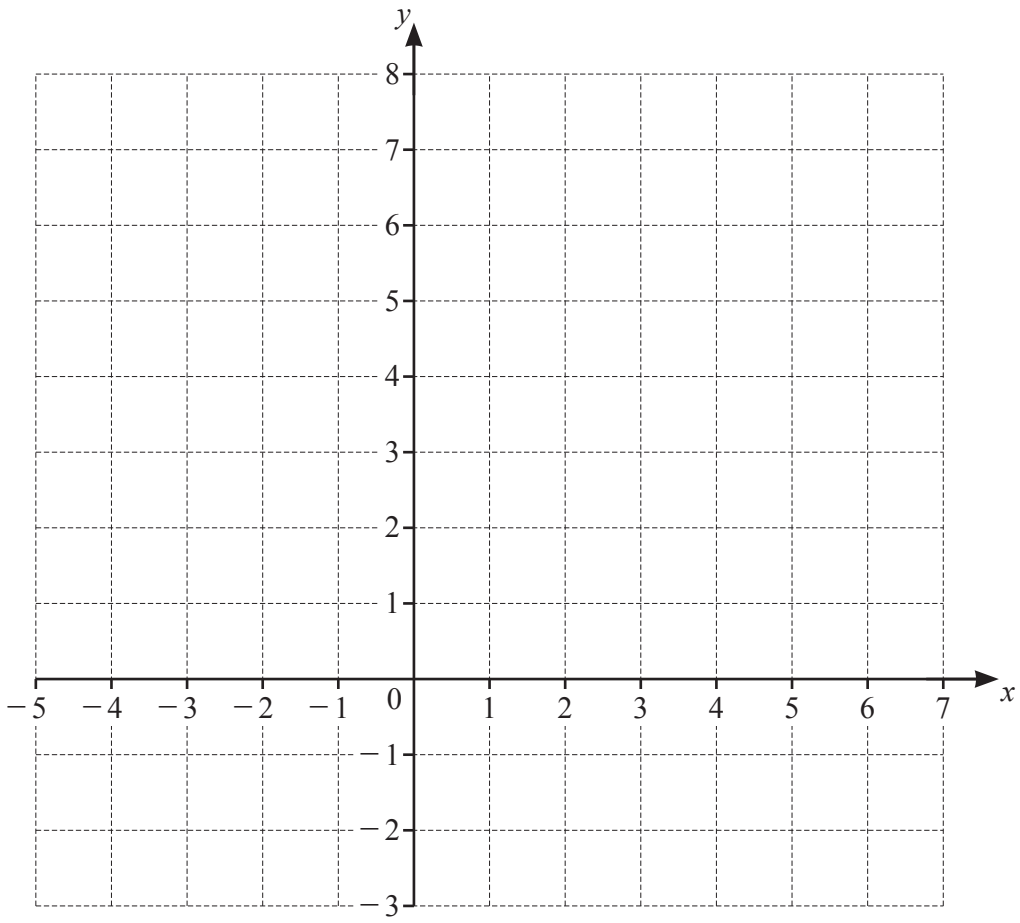


[1]

© UCLES 2023

15

View solution



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 $P = 2w + 2h$

View solution

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

Find the lower bound and the upper bound for P.

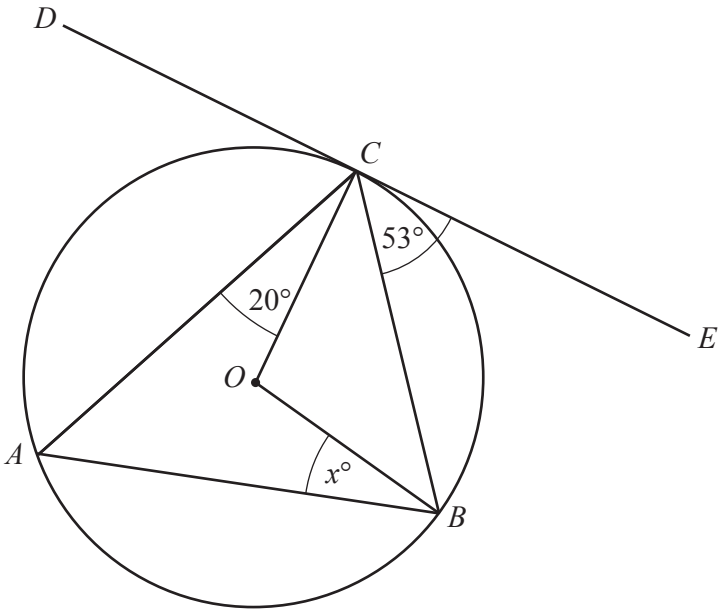
Lower bound = ...

Upper bound = ... [3]

© UCLES 2023

17

View solution



NOT TO SCALE

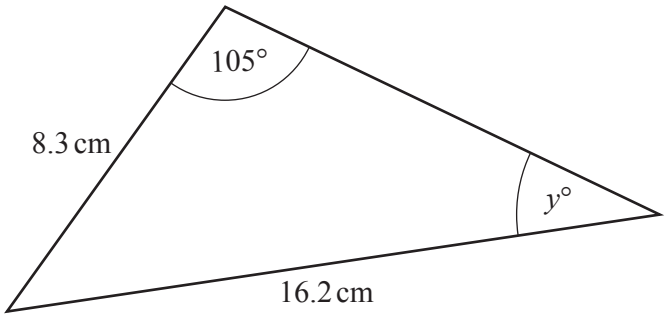
A, B and C are points on the circumference of a circle, centre O.
Tangent DE touches the circle at C.
Angle $BCE = 53°$ and angle $ACO = 20°$.

Find the value of x.

$x =$ ..... [3]

18

View solution



NOT TO SCALE

Calculate the value of y.

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

19 **(a)**

View solution



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.

View solution

..... [2]

20 Write as a single fraction in its simplest form.

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

View solution

..... [3]

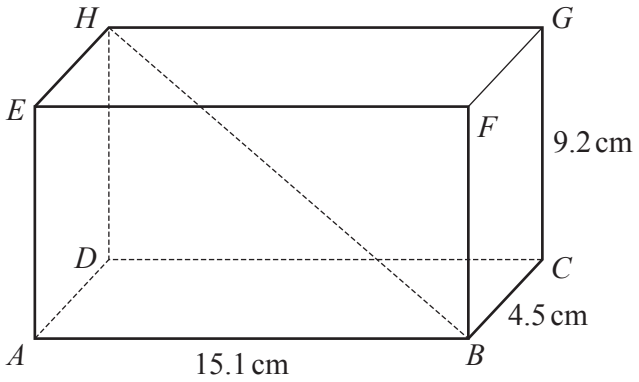
(b) $\dfrac{7}{x+3} + \dfrac{5}{8x-1}$

View solution

..... [3]

© UCLES 2023

21



NOT TO SCALE

View solution

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 $ADHE$.

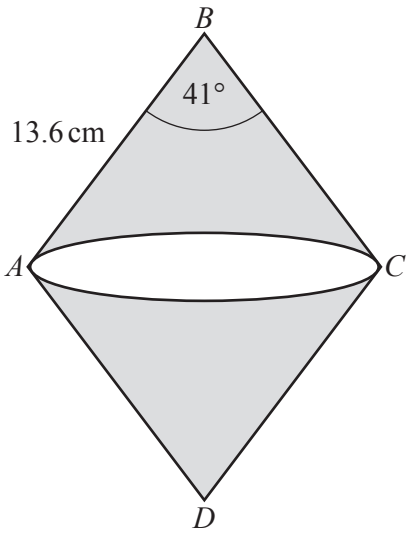
..... [4]

Question 22 is printed on the next page.

© UCLES 2023

22

View solution



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]

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.

© UCLES 2023