Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

1172955684

MATHEMATICS **0580/22**

Paper 2 (Extended) **February/March 2020**

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. Blank pages are indicated.

DC (LK/SW) 182802/2
© UCLES 2020

1 3.56 5 $\sqrt{196}$ 8 $\sqrt{7}$ 12

From the list, write down a number that is

(a) a multiple of 3,

..... [1]

(b) a cube number,

..... [1]

(c) a prime number,

..... [1]

(d) an irrational number.

..... [1]

2 The number of people swimming in a pool is recorded each day for 12 days.

24	28	13	38	15	26
45	21	48	36	18	38

(a) Complete the stem-and-leaf diagram.

1	
2	
3	
4	

Key: 1 | 3 represents 13 swimmers

[2]

(b) Find the median number of swimmers.

..... [1]

© UCLES 2020

3 Point A has coordinates (6, 4) and point B has coordinates (2, 7).

Write $\overrightarrow{AB}$ as a column vector.

$\overrightarrow{AB} = \begin{pmatrix} \quad \\ \quad \end{pmatrix}$ [1]

4 Find the interior angle of a regular polygon with 24 sides.

..... [2]

5 **Without using a calculator,** work out $\frac{15}{28} \div \frac{4}{7}$.

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

..... [3]

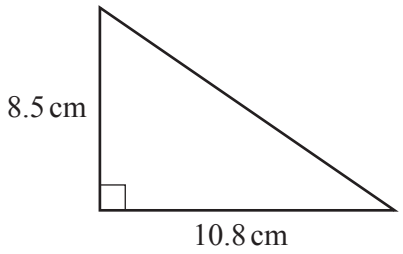
6 The table shows the marks scored by 40 students in a test.

Mark	5	6	7	8	9	10
Frequency	8	5	11	7	5	4

Calculate the mean mark.

..... [3]

7



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the area.

..... cm^2 [2]

(b) Calculate the perimeter.

..... cm [3]

© UCLES 2020

8 Calculate the value of $(2.3 \times 10^{-3}) + (6.8 \times 10^{-4})$.
Give your answer in standard form.

..... [1]

9 **(a)** Factorise completely.

$3x^2 - 12xy$

..... [2]

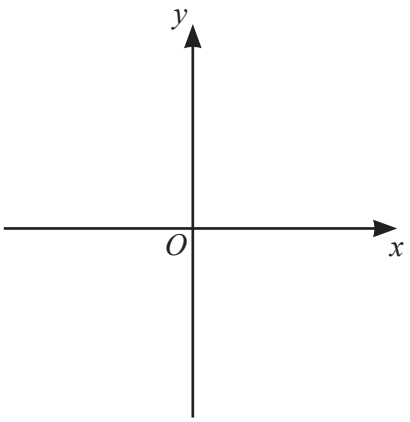
(b) Expand and simplify.

$(m-3)(m+2)$

..... [2]

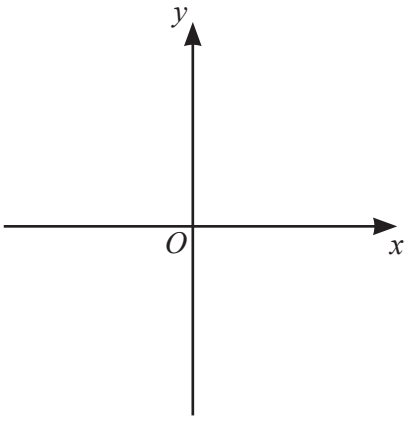
10 Sketch the graph of each function.

(a) $y = x - 3$



[1]

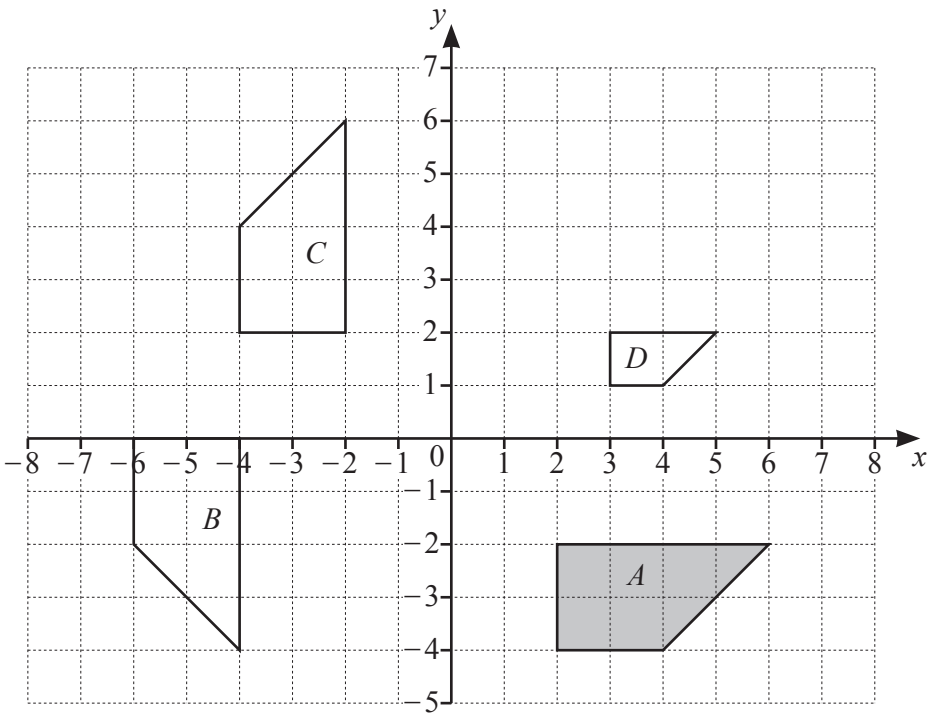
(b) $y = \frac{1}{x}$



[2]

© UCLES 2020

11



Describe fully the **single** transformation that maps

(a) shape *A* onto shape *B*,

.....

..... [3]

(b) shape *A* onto shape *C*,

.....

..... [2]

(c) shape *A* onto shape *D*.

.....

..... [3]

12 The population of a town decreases exponentially at a rate of 1.7% per year.
The population now is 250 000.

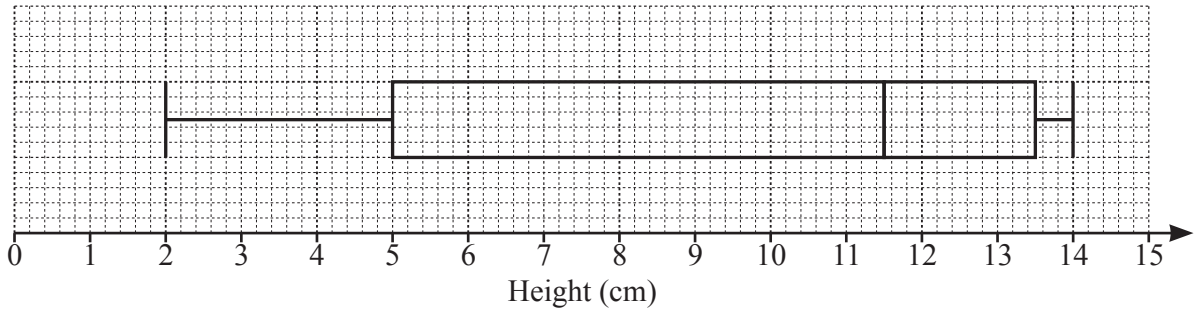
Calculate the population at the end of 5 years.
Give your answer correct to the nearest hundred.

..... [3]

13 Write the recurring decimal $0.2\dot{6}$ as a fraction.
You must show all your working.

..... [2]

14 The box-and-whisker plot gives information about the heights, in centimetres, of some plants.



(a) Write down the median.

..... cm [1]

(b) Find

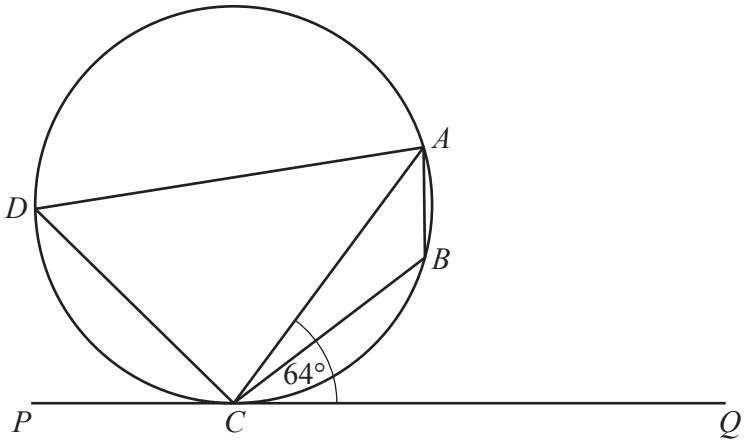
(i) the range,

..... cm [1]

(ii) the interquartile range.

..... cm [1]

15



NOT TO SCALE

A, *B*, *C* and *D* lie on the circle.
PCQ is a tangent to the circle at *C*.
Angle *ACQ* = 64°.

Work out angle *ABC*, giving reasons for your answer.

Angle *ABC* = ... because .....

.....

..... [3]

16 Solve the simultaneous equations.
You must show all your working.

$$x = 7 - 3y$$
$$x^2 - y^2 = 39$$

$x =$ ..... $y =$ .....

$x =$ ..... $y =$ ..... [6]

17 A is the point (3, 5) and B is the point $(1, -7)$.

Find the equation of the line perpendicular to AB that passes through the point A.
Give your answer in the form $y = mx + c$.

$y =$ ..... [4]

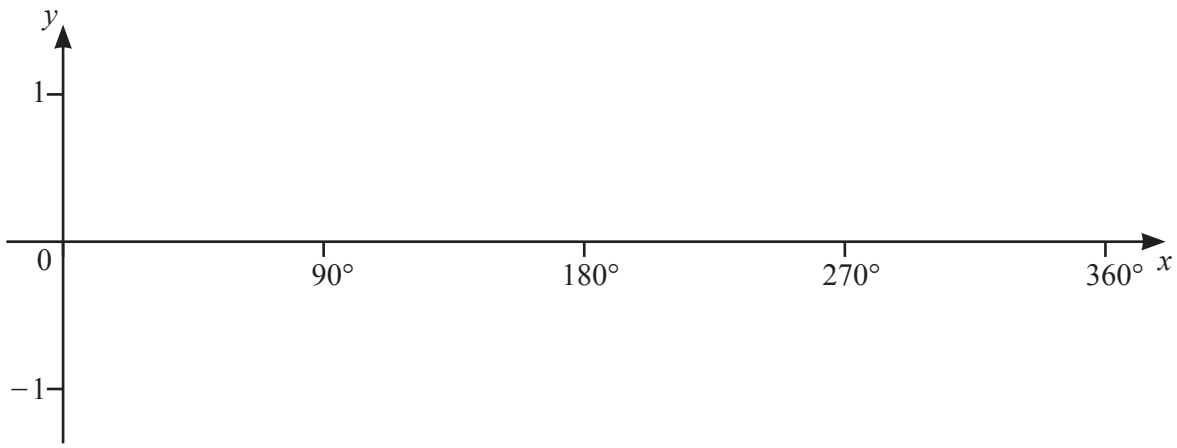
© UCLES 2020

18 A car travels at a constant speed.
It travels a distance of 146.2 m, correct to 1 decimal place.
This takes 7 seconds, correct to the nearest second.

Calculate the upper bound for the speed of the car.

..... m/s [3]

19



(a) On the diagram, sketch the graph of $y = \cos x$ for $0° \leqslant x \leqslant 360°$. [2]

(b) Solve the equation $4\cos x + 2 = 3$ for $0° \leqslant x \leqslant 360°$.

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

Questions 20 and 21 are printed on the next page.

20 $x^2 - 12x + a = (x + b)^2$

Find the value of a and the value of b.

$a =$ .....

$b =$ ..... [2]

21 $\overrightarrow{XY} = 3\mathbf{a} + 2\mathbf{b}$ and $\overrightarrow{ZY} = 6\mathbf{a} + 4\mathbf{b}$.

Write down two statements about the relationship between the points X, Y and Z.

1 .....

2 ..... [2]

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 the Cambridge Assessment Group. Cambridge Assessment is the brand name of the University of Cambridge Local Examinations Syndicate (UCLES), which itself is a department of the University of Cambridge.

© UCLES 2020