



Cambridge IGCSE™

CANDIDATE
NAME

CENTRE
NUMBER

--	--	--	--	--

CANDIDATE
NUMBER

--	--	--	--

MATHEMATICS

0580/22

Paper 2 (Extended)

February/March 2021

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.

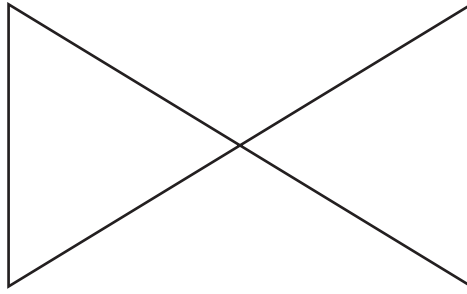
INFORMATION

- 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.



1



(a) Complete this statement.

The diagram has rotational symmetry of order [1]

(b) On the diagram, draw all the lines of symmetry. [2]

2 Sahil and Anika share \$78 in the ratio 5 : 8.

Calculate the amount each receives.

Sahil \$

Anika \$ [2]

3 The number of passengers on a bus is recorded each day for 14 days.

15 18 22 17 35 38 24
19 19 24 25 31 36 29

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

1	
2	
3	

Key: 1 | 5 represents 15 passengers

[2]

(b) Find the median.

..... [1]

- 4 By writing each number correct to 1 significant figure, find an estimate for the value of

$$\frac{2.8 \times 82.6}{27.8 - 13.9}$$

..... [2]

- 5 The number of bowls of hot soup sold decreases when the temperature rises.

What type of correlation does this statement describe?

..... [1]

- 6 Joseph spends $\frac{5}{24}$ of one week's earnings to buy a jacket.
The cost of the jacket is \$56.50 .

Calculate the amount Joseph earns in a week.

\$ [2]

- 7 **Without using a calculator**, work out $2\frac{1}{4} \times 3\frac{2}{3}$.

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

..... [3]

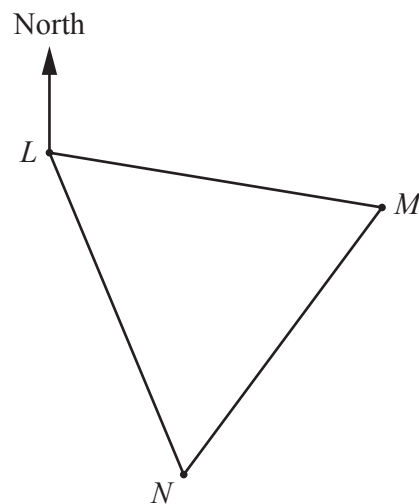
8 Write $0.\dot{3}7$ as a fraction.

..... [1]

9 Calculate $4.8 \times 10^6 + 3.7 \times 10^7$.
Give your answer in standard form.

..... [1]

10



NOT TO
SCALE

On a map, the positions of the towns L , M and N form an equilateral triangle.
The bearing of M from L is 103° .

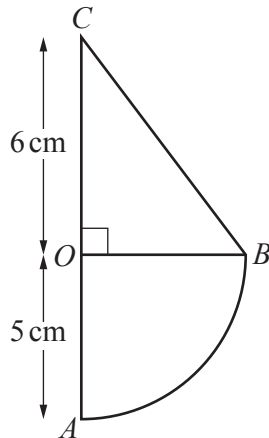
Work out the bearing of L from N .

..... [2]

11 Find the highest common factor (HCF) of 36 and 84.

..... [2]

12



NOT TO SCALE

The diagram shows a shape made from a quarter-circle, OAB , and a right-angled triangle OBC . The radius of the circle is 5 cm and $OC = 6$ cm.

Calculate the area of the shape.

..... cm^2 [3]

13 The population of one variety of butterfly is decreasing exponentially at a rate of 34% per year. At the end of 2014, the population was 125.9 million.

Calculate the population at the end of 2019.

..... million [2]

14 (a) These are the first four terms of a sequence.

29 22 15 8

Write down the next two terms.

..... , [2]

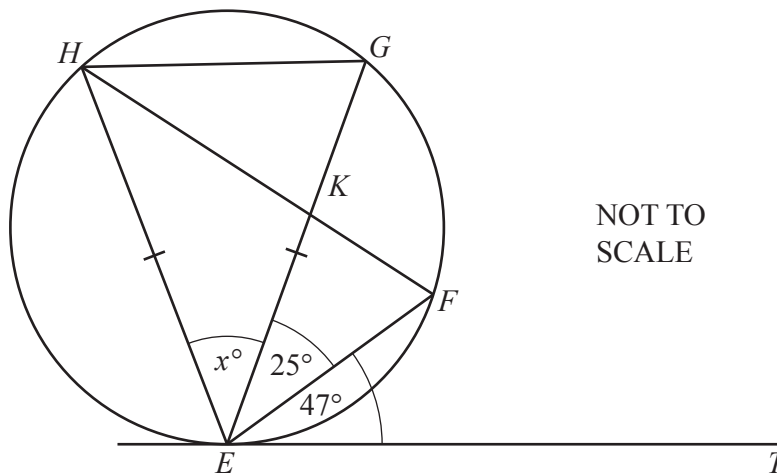
(b) These are the first five terms of another sequence.

4 7 12 19 28

Find the n th term.

..... [2]

15



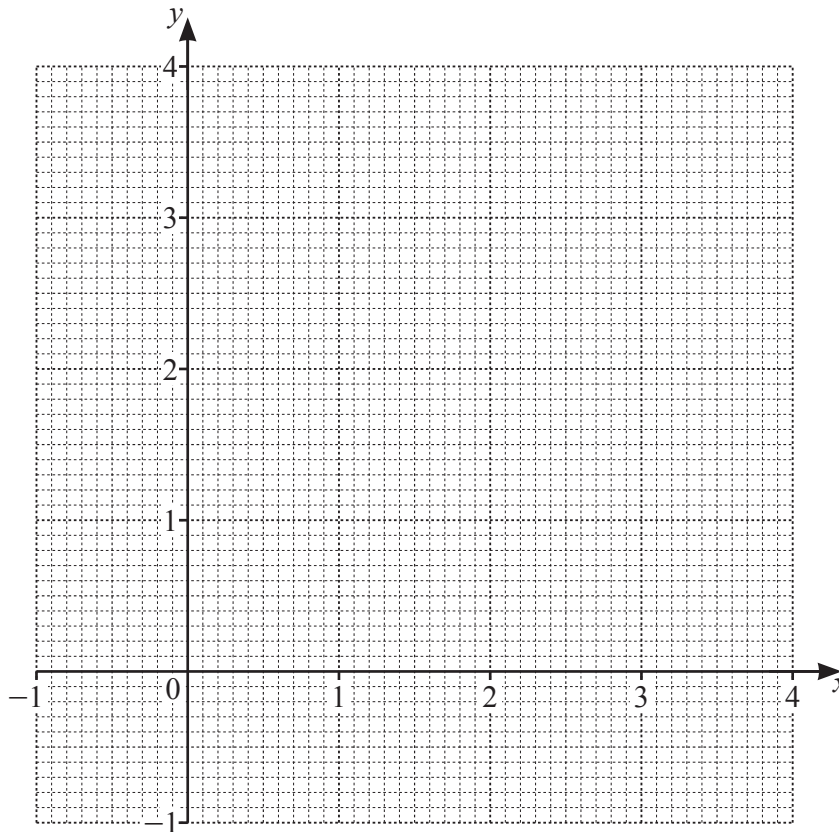
NOT TO SCALE

Points E, F, G and H lie on the circle and $EG = EH$.
 HF and EG intersect at K .
 ET is a tangent to the circle at E .
 Angle $FET = 47^\circ$ and angle $FEG = 25^\circ$.

Find the value of x .

$x =$ [2]

16



The region R satisfies these three inequalities.

$$y > 1 \quad y < 2x + 2 \quad x + y \leq 3$$

By drawing three suitable lines, and shading unwanted regions, find and label the region R . [5]

- 17 Some students were asked how many books they each had in their school bags. The table shows some of this information.

Number of books	5	6	7	8	9	10
Frequency	4	5	x	11	7	5

The mean number of books is 7.6 .

Calculate the value of x .

$$x = \dots\dots\dots [3]$$

18 Simplify $(343x^9)^{\frac{2}{3}}$.

..... [2]

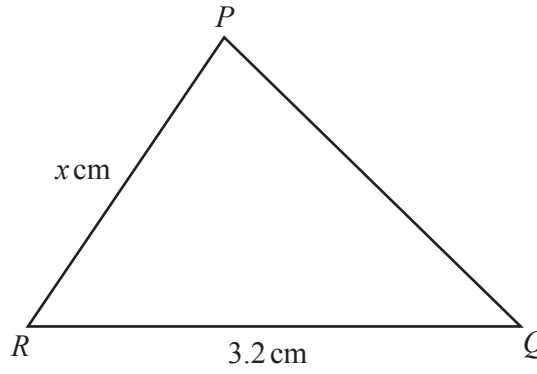
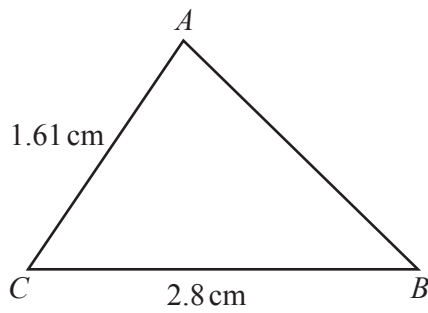
19 Solve the simultaneous equations.
You must show all your working.

$$\begin{aligned}x - y &= 7 \\ x^2 + y &= 149\end{aligned}$$

$x = \dots\dots\dots y = \dots\dots\dots$

$x = \dots\dots\dots y = \dots\dots\dots$ [5]

20 (a)



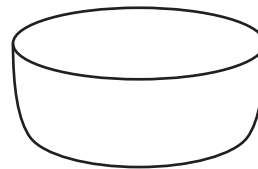
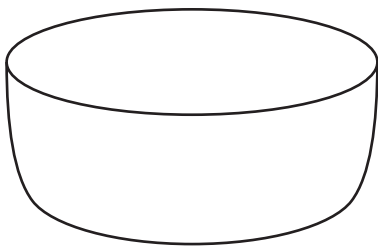
NOT TO SCALE

Triangle ABC is mathematically similar to triangle PQR .

Find the value of x .

$x = \dots\dots\dots$ [2]

(b)



NOT TO SCALE

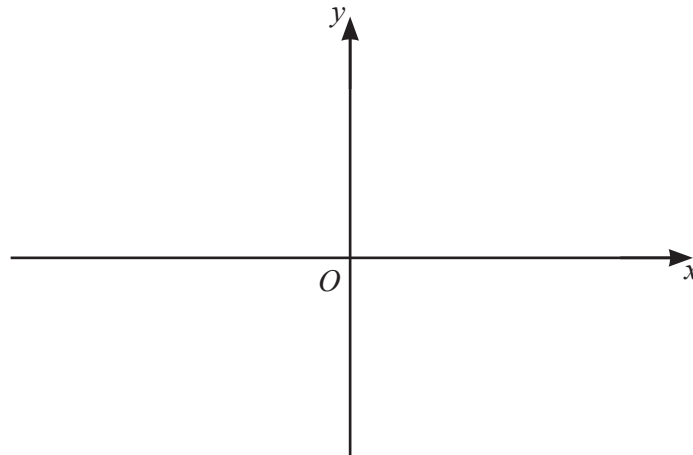
The diagram shows two mathematically similar bowls.
 The larger bowl has capacity 7.8 litres and height 11.5 cm.
 The smaller bowl has capacity 4 litres.

Calculate the height of the smaller bowl.

$\dots\dots\dots\text{ cm}$ [3]

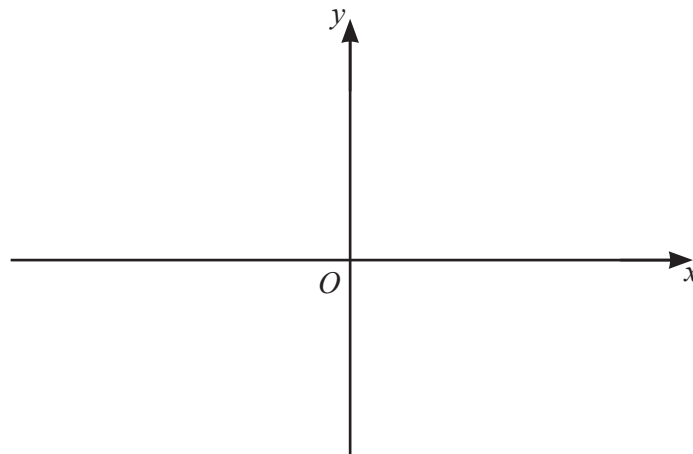
21 On the axes, sketch the graph of each of these functions.

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



[2]

(b) $y = 4^x$



[2]

22 (a) A bag of rice has a mass of 25 kg, correct to the nearest kilogram.

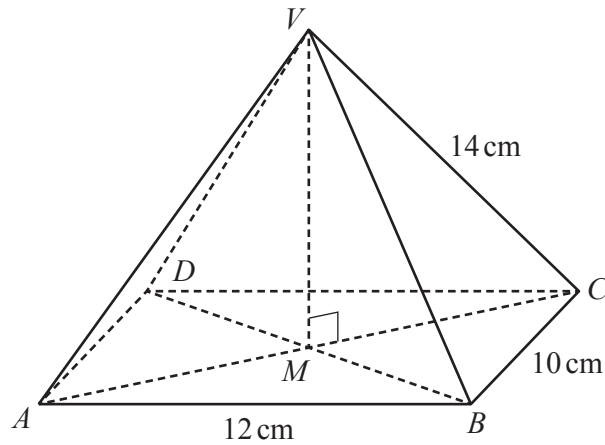
Calculate the lower bound of the total mass of 10 of these bags.

..... kg [1]

(b) Virat has 200 metres of wire, correct to the nearest metre.
He cuts the wire into n pieces of length 3 metres, correct to the nearest 20 centimetres.

Calculate the largest possible value of n .

$n =$ [3]



NOT TO
SCALE

The diagram shows a pyramid $VABCD$ with a rectangular base.
 V is vertically above M , the intersection of the diagonals AC and BD .
 $AB = 12$ cm, $BC = 10$ cm and $VC = 14$ cm.

Calculate the angle that VC makes with the base $ABCD$.

..... [4]

Question 24 is printed on the next page.

24 A curve has equation $y = x^3 - 2x^2 + 5$.

Find the coordinates of its two stationary points.

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

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.