Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

3190611897

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.

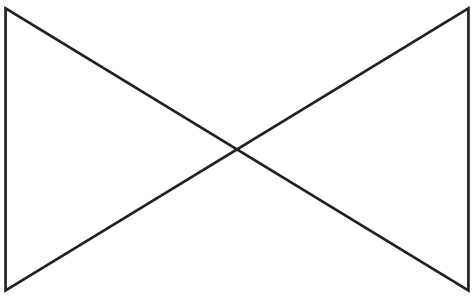
INFORMATION

- 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.

[Turn over

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]

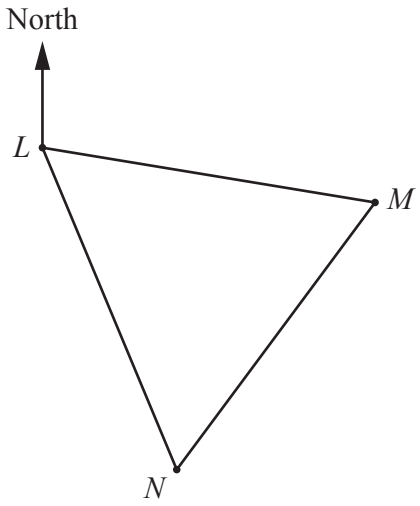
8 Write $0.\dot{3}\dot{7}$ as a fraction.

..... [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°.

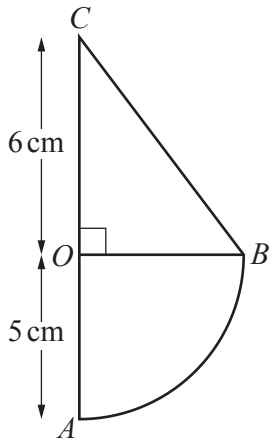
Work out the bearing of L from N.

..... [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]

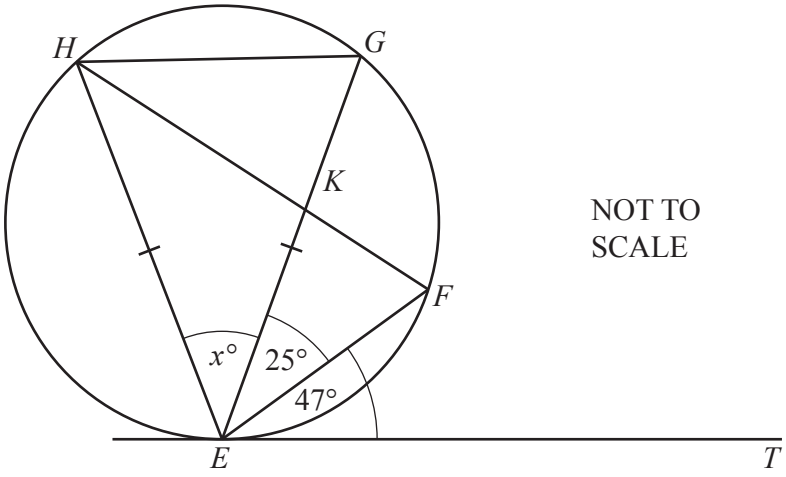
(b) These are the first five terms of another sequence.

4 7 12 19 28

Find the nth term.

..... [2]

15

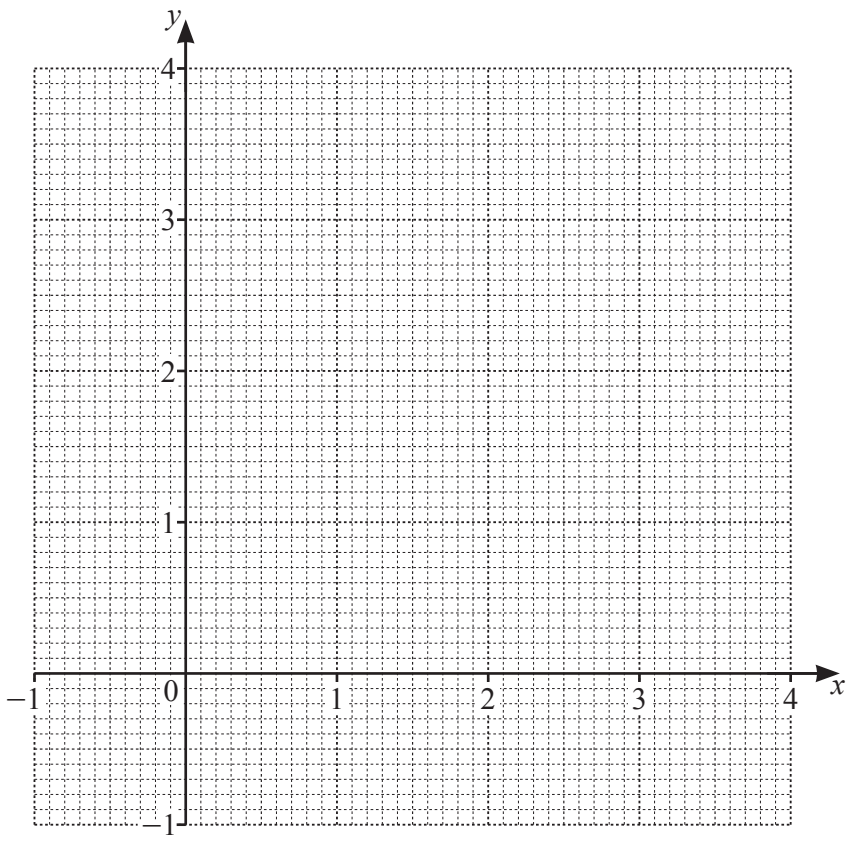


Points E, F, G and H lie on the circle and $EG = EH$.
HF and EG intersect at K.
ET is a tangent to the circle at E.
Angle $FET = 47°$ and angle $FEG = 25°$.

Find the value of x.

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

16



The region R satisfies these three inequalities.

$$y > 1 \qquad y < 2x + 2 \qquad x + y \leqslant 3$$

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.

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

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

..... [2]

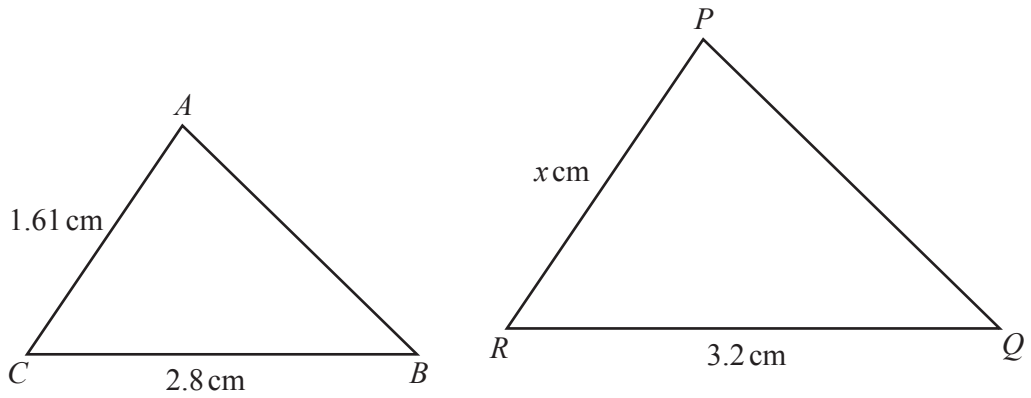
19 Solve the simultaneous equations.
You must show all your working.

$$x - y = 7$$
$$x^2 + y = 149$$

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

$x =$ ..... $y =$ ..... [5]

20 (a)



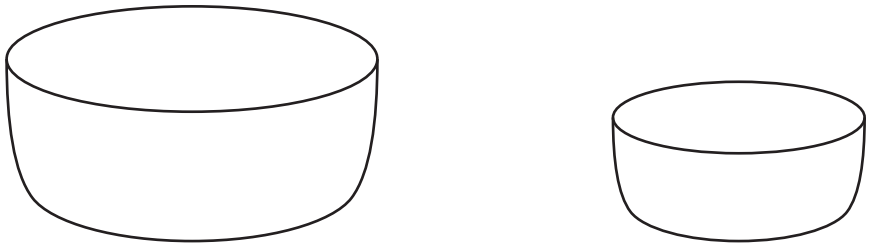
NOT TO SCALE

Triangle ABC is mathematically similar to triangle PQR.

Find the value of x.

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

(b)



NOT TO SCALE

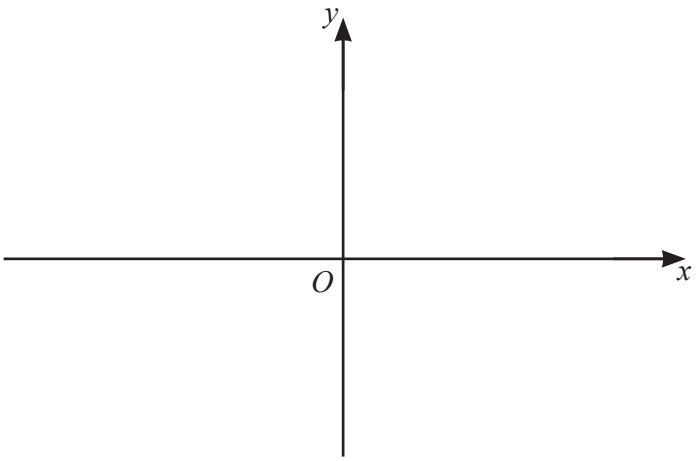
The diagram shows two mathematically similar bowls.
The larger bowl has capacity 7.8 litres and height 11.5 cm.
The smaller bowl has capacity 4 litres.

Calculate the height of the smaller bowl.

..... cm [3]

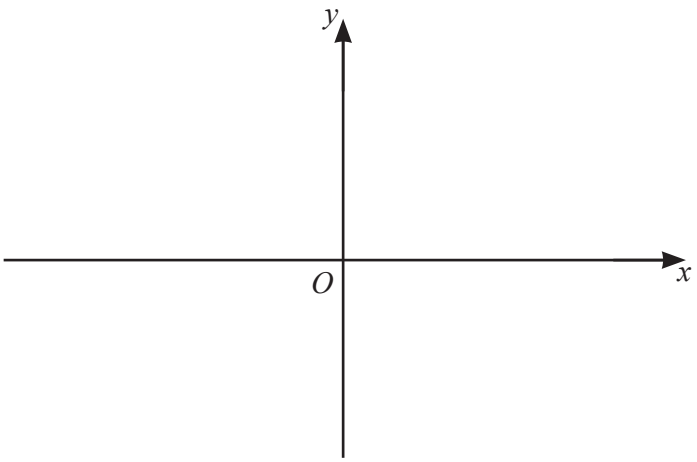
21 On the axes, sketch the graph of each of these functions.

(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.

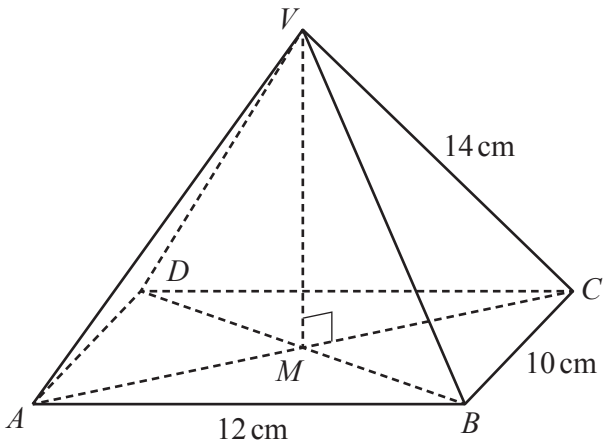
..... kg [1]

(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]

23



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]