



Cambridge IGCSE[™]

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

MATHEMATICS 0580/22

Paper 2 (Extended)

October/November 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.

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	Adico

1	The temperature at midnight is -8.5 °C.
	The temperature at 11 am is -1 °C.

Work out the difference between the temperature at midnight and the temperature at 11 am.

0.0	Г17
.	111
	1 + 1

2 The stem-and-leaf diagram shows the age, in years, of each of 15 women.

3	1	5	8	9			
4	1	1	2	3	5	6	9
5	0	2	3	8			

Key: 3 | 1 represents 31 years

Complete these statements.

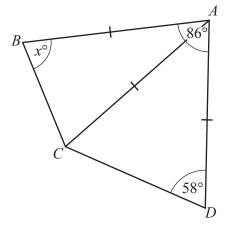
The modal age is	
The median age is	
The percentage of women that are older than 51 years is%.	[3]

3 Change 2.15 hours into minutes.

	min	[1]
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4



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Triangle ABC and triangle ACD are isosceles. Angle $DAB = 86^{\circ}$ and angle $ADC = 58^{\circ}$.

Find the value of x.

<i>x</i> =	[3	

Angelique rents a room for a party.

The cost of renting the room is \$15.50 for the first hour and then \$7.25 for each additional hour. She pays \$95.25 in total.

Work out the total number of hours she rents the room for.

hours	[3]



6 Without using a calculator, work out $\frac{1}{3} \div \frac{7}{6} + \frac{1}{5}$.

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

.....[4]

7 Katy has 5 white flowers, x red flowers and (2x+1) yellow flowers. She picks a flower at random.

The probability that it is white is $\frac{1}{12}$.

Find the probability that it is yellow.

.....[4]

8 Calculate $\sqrt[4]{39\frac{1}{16}}$.

.....[1]

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9
$$2.1 \times 10^{-1}$$

 $0.\dot{2}$

22%

 $\sqrt{0.2}$

 $\frac{24}{1000}$

Write these values in order of size, starting with the smallest.

10 The interior angle of a regular polygon is 156°.

Work out the number of sides of this polygon.

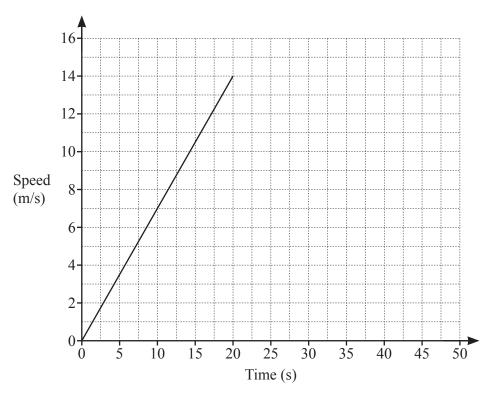
.....[2]

A car starts its journey by accelerating from rest at a constant rate of 0.7 m/s² for 20 seconds, before reaching a constant speed of 14 m/s.

It then travels at 14 m/s for a distance of 210 m.

The car then decelerates at a constant rate of $1.4 \,\mathrm{m/s}^2$, before coming to a stop.

On the grid, complete the speed–time graph for the car's journey.



[3]

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12 The table shows the first five terms of sequences A, B and C.

	1st term	2nd term	3rd term	4th term	5th term	<i>n</i> th term
Sequence A	8	3	-2	-7	-12	
Sequence B	2	$\frac{3}{2}$	4/3	<u>5</u> 4	<u>6</u> <u>5</u>	
Sequence C	1/2	1	2	4	8	

Complete the table to show the *n*th term of each sequence.

[5]

13 (a) Write 243×27^{2n} as a single power of 3 in terms of n.

.....[2]

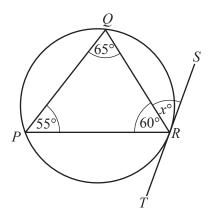
(b) $k = 2 \times 3^2 \times p^3$, where p is a prime number greater than 3.

Write $6k^2$ as a product of prime factors in terms of p.

.....[2]

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P, Q and R are points on a circle. ST is a tangent to the circle at R.

(a)	Write down the value of <i>x</i> .
	Give a geometrical reason for your answer.

x = because.	
	[2]

(b) Another tangent from the point S touches the circle at V.

give a geometrical reason why triangle SVR is isosceles.	

.....[1]

15 (a) A is the point (3, 16) and B is the point (8, 31).

Find the equation of the line that passes through A and B. Give your answer in the form y = mx + c.

$$y =$$
 [3]

(b) The line *CD* has equation y = 0.5x - 11.

Find the gradient of a line that is perpendicular to the line *CD*.



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[2]

- Sachin picks a number at random from the first three multiples of 3. He then picks a number at random from the first three prime numbers. He adds the two numbers to find a score.
 - (a) Complete the table.

		Multiples of 3			
		3		9	
	2	5		11	
Prime numbers	3	6			

(b)	Given that the	score is even,	find the	probability that	one of the	numbers he	picks is	9.

 	[2]
 	[-]

17 Solve.
$$(5x-3)(2x+7) = 0$$

$$x = \dots$$
 or $x = \dots$ [1]

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

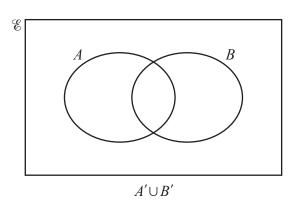
$$y = x^2 - 9x + 21$$

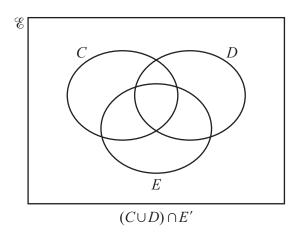
$$y = x^2 - 9x + 2$$

$$y = 2x - 3$$

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

19 In these Venn diagrams, shade the given regions.





[2]

20
$$f(x) = 2^{x-3}$$

$$g(x) = 2x - 1$$

$$f(x) = 2^{x-3}$$
 $g(x) = 2x-1$ $h(x) = \frac{5}{x-4}$

(a) Find ff(6).

.....[2]

(b) Find $g^{-1}g(x+21)$.

.....[1]

(c) Find x when f(x) = h(84).

$$x =$$
 [2]

21	Expand and simplify.
	$(x-3)^2(2x+5)$

				••••••	 	 [3]
22	Solve the equation	$7\sin x + 2 = 0$	for $0^{\circ} \leqslant x \leqslant 30^{\circ}$	60°.		

.....[3]

Question 23 is printed on the next page.

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23 Simplify.

$$\frac{3xy + 36y - 5x - 60}{2x^2 - 288}$$

.....[4]

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