

### **Cambridge IGCSE**<sup>™</sup>

CANDIDATE NAME					
CENTRE NUMBER			CANDIDATE NUMBER		

MATHEMATICS 0580/22

Paper 2 (Extended) May/June 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  $\pi$ , 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 [ ].

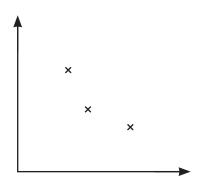
This document has 16 pages. Any blank pages are indicated.

2

1	The probability that Jane	wins	a game	is $\frac{7}{1}$	<del>7</del> 0.							
	(a) Find the probability	that J	ane doe	s no	ot win 1	the gar	ne.					
	(b) Jane plays this gam Find the number of			xpec	cted to	win th	ne gam	e.				[1]
2	Calculate $\sqrt[4]{0.0256}$ .											[1]
												[1]
3	Emma has 15 mathemati The stem-and-leaf diagra	ics que am sho	estions to ows the t	o co time	mpleto e, in m	e. inutes,	it take	es her	to con	plete each	question.	
		0	3	5	6	7	7	8	8			
		2	0	2	2	3	6	6	6			
		2	0							1		
	Complete the table.							ķ	Cey: 2	0 = 20  m	nnutes	
		M	lode					m	in			
		M	Iedian			•••••	•••••	m	in			
		R	ange					m	in			
												[3]
4	Write down an expression	on for	the range	e of	k cons	secutiv	e integ	gers.				
												[1]

3

5 (a) Henrik draws this scatter diagram.



Put a ring around the **one** correct statement about this scatter diagram.

It shows no correlation.

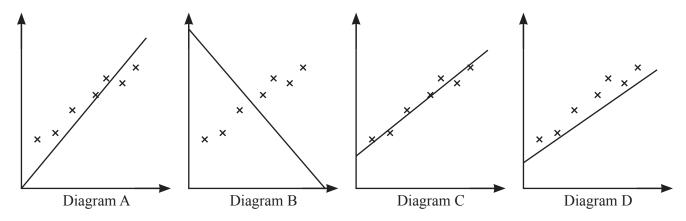
It is not possible to tell if there is correlation as there are not enough points. It shows negative correlation.

It shows positive correlation.

[1]

[1]

**(b)** Each of the four scatter diagrams shows the same set of data. A line has been drawn on each diagram.



Complete the statement.

The line in Diagram ..... is the most appropriate line of best fit.

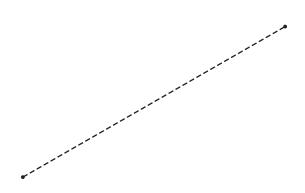
4

6 A rhombus has side length 6.5 cm. The rhombus can be constructed by drawing two triangles.

Using a ruler and compasses only, construct the rhombus.

Leave in your construction arcs.

One diagonal of the rhombus has been drawn for you.



[2]

7 (a) Complete these statements.

The reciprocal of 0.2 is .....

**(b)**  $\frac{7}{5}$  0.6  $\sqrt{7}$  8  $\sqrt{9}$ 

From this list, write down an irrational number.

.....[1]

5

$$a = \frac{b^2}{5c}$$

Find b when a = 5.625 and c = 2.

$$b = \dots$$
 [2]

9 Without using a calculator, work out  $\frac{2}{3} \div 1\frac{3}{7}$ .

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



10 (a) Write 0.00654 in standard form.

**(b)** The number  $1.467 \times 10^{102}$  is written as an ordinary number.

Write down the number of zeros that follow the digit 7.



6

11 Write  $0.\dot{0}\dot{4}$  as a fraction in its simplest form.

.....[1]

12 (a)  $\mathscr{E} = \{\text{integers greater than 2}\}$ 

 $A = \{ prime numbers \}$ 

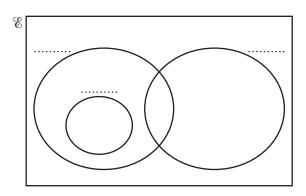
 $B = \{ \text{odd numbers} \}$ 

 $C = \{ \text{square numbers} \}$ 

(i) Describe the type of numbers in the set  $B' \cap C$ .

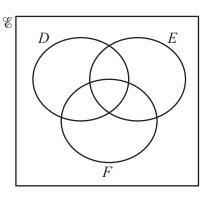


(ii) Complete the set labels on the Venn diagram.



[1]

**(b)** 

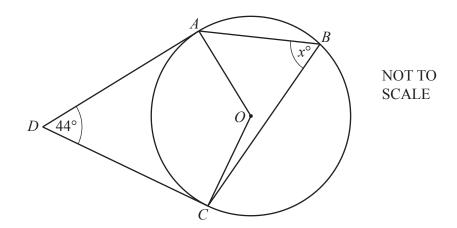


Shade the region  $D' \cup (E \cap F)'$ .

[1]

7

13

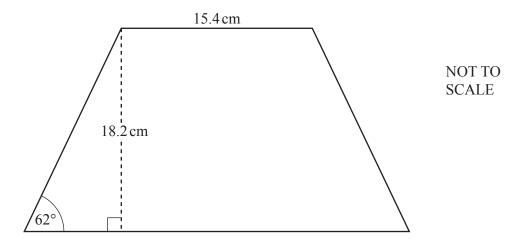


A, B and C are points on a circle, centre O. DA and DC are tangents. Angle  $ADC = 44^{\circ}$ .

Work out the value of x.

x	=	 [3]

14



The diagram shows a trapezium.

The trapezium has one line of symmetry.

Work out the area of the trapezium.

		$cm^2$	Г/1
		cm	141

9

15 Complete the table showing information about the congruence of pairs of triangles. The first two rows have been completed for you. All diagrams are not to scale.

Pair of triangles	Congruent or not congruent	Congruence criterion
60° 25° 60° 6cm	Congruent	ASA
3.4 cm 4 cm 3 cm 3.4 cm	Not congruent	None
6.5 cm  6.5 cm  7 cm  7 cm		
4.5 cm 5 cm 4 cm 4.5 cm		
5.2 cm 5.2 cm 65°		

[3]

10

16	A is	the point $(5, 7)$ and $B$ is the point $(9, -1)$ .		
	(a)	Find the length $AB$ .		
				[3]
	(b)	Find the equation of the line $AB$ .		
				[3]
	ъ.			
17	Fino	d the gradient of the line that is perpendicular to the line $3y = 4$	4x-5.	
				[2]

11

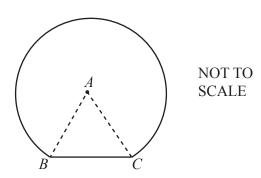
18 
$$f(x) = x^2 - 25$$
  $g(x) = x + 4$ 

Solve fg(x+1) = gf(x).

$$x = \dots$$
 [4]

12

19 (a)



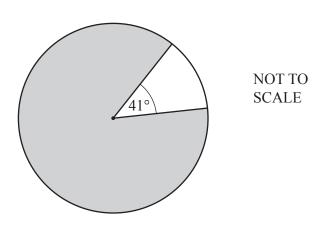
The diagram shows a shape made from an equilateral triangle ABC and a sector of a circle. Points B and C lie on the circle, centre A.

The side length of the equilateral triangle is 12.4 cm.

Work out the perimeter of the shape.

..... cm [3]

**(b)** 



The diagram shows two sectors of a circle.

The major sector is shaded.

The area of the major sector is  $74.5 \text{ cm}^2$ .

Calculate the radius of the circle.

.....cm [3]

13

20	Expand and si	implify.		•			
			(x-2)(2x+5)(x+3)	3)			
							[3]
21	The force of a distance, $d \text{ cm}$		F Newtons, between the magnets.	n two magnets i	s inversely propo	rtional to the squ	uare of the
	When $d = 1.5$	5, F = 48.					
	(a) Find an e	expression	for $F$ in terms of $d$ .				
					$F = \dots$		[2]
	<b>(b)</b> When the	e distance	between the two ma	gnets is double	d the new force is	<i>n</i> times the orig	inal force.
	Work out	t the value	of $n$				
	,, 6111 0 41	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	01.11				

22	Simplify.	
	1 2	$2x^2 - 5x - 12$
		$3x^2 - 12x$

	[4]
--	-----

23 Find all the solutions of  $4\sin x = 3$  for  $0^{\circ} \le x \le 360^{\circ}$ .

24 Solve.

$$\frac{1}{x+1} + \frac{9}{x+9} = 1$$

$$x =$$
 or  $x =$  [5]

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