Cambridge Assessment International Education

Cambridge IGCSE™

CANDIDATE NAME

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8980282381

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 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 **16** pages. Any blank pages are indicated.

[Turn over

1 The probability that Jane wins a game is $\frac{7}{10}$.

(a) Find the probability that Jane does not win the game.

..... [1]

(b) Jane plays this game 50 times.

Find the number of times she is expected to win the game.

..... [1]

2 Calculate $\sqrt[4]{0.0256}$.

..... [1]

3 Emma has 15 mathematics questions to complete.
The stem-and-leaf diagram shows the time, in minutes, it takes her to complete each question.

0	3	5	6	7	7	8	8
1	1	2	2	3	6	6	6
2	0						

Key: 2 | 0 = 20 minutes

Complete the table.

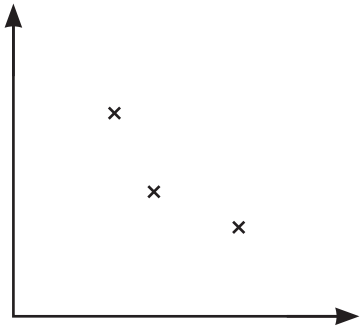
Mode	..... min
Median	..... min
Range	..... min

[3]

4 Write down an expression for the range of k consecutive integers.

..... [1]

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]

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

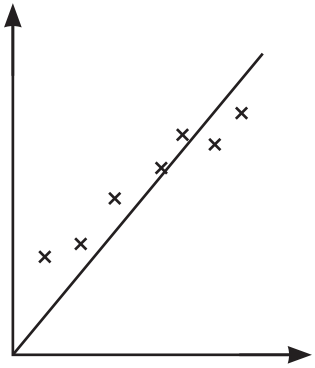


Diagram A

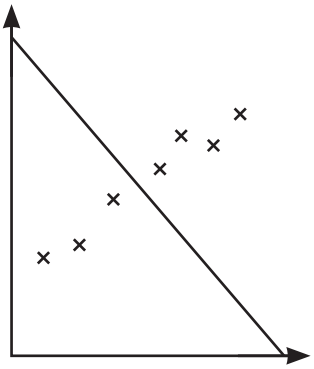


Diagram B

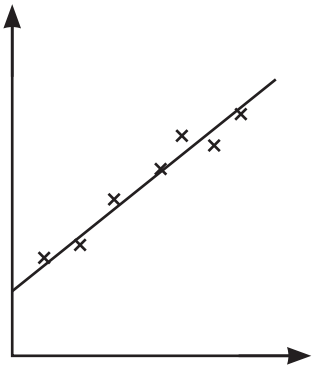


Diagram C

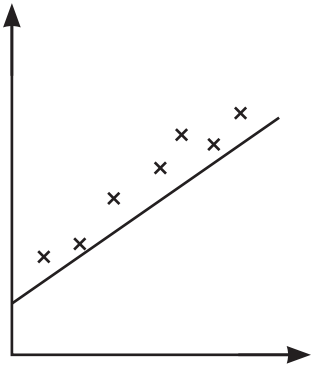


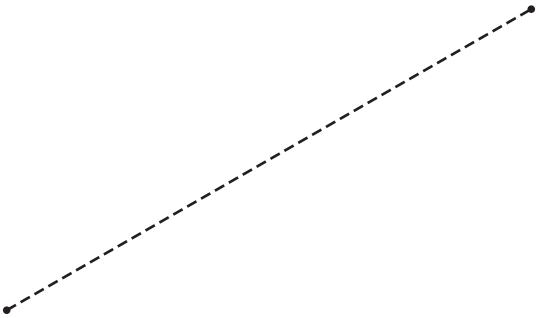
Diagram D

Complete the statement.

The line in Diagram ..... is the most appropriate line of best fit. [1]

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 .....

A prime number between 90 and 100 is ..... [2]

(b)

$\frac{7}{5}$ 0.6 $\sqrt{7}$ 8 $\sqrt{9}$

From this list, write down an irrational number.

..... [1]

8 $a = \dfrac{b^2}{5c}$

Find b when $a = 5.625$ and $c = 2$.

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

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

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

..... [3]

10 **(a)** Write 0.006 54 in standard form.

..... [1]

(b) The number 1.467×10^{102} is written as an ordinary number.

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

..... [1]

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

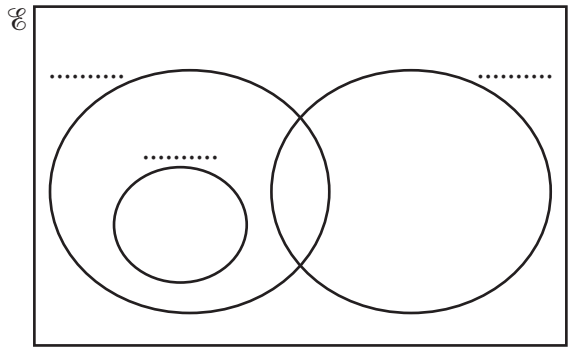
..... [1]

12 **(a)** $\mathscr{E}$ = {integers greater than 2}
A = {prime numbers}
B = {odd numbers}
C = {square numbers}

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

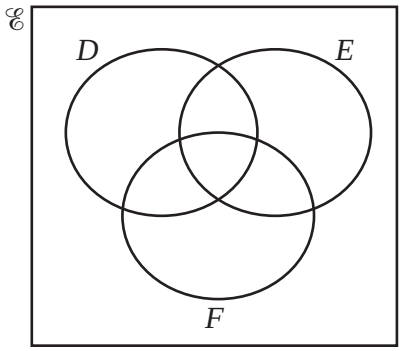
..... [1]

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



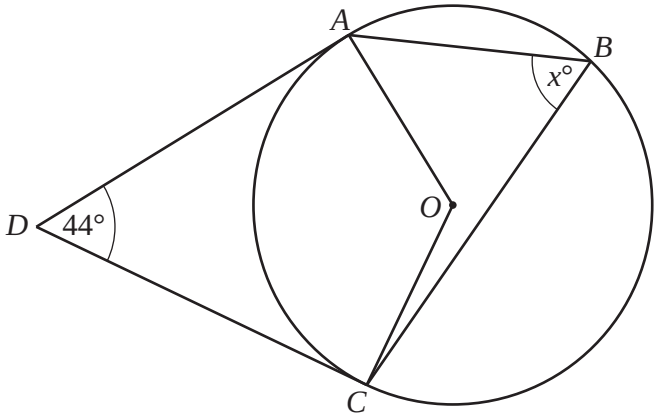
[1]

(b)



Shade the region $D' \cup (E \cap F)'$. [1]

13



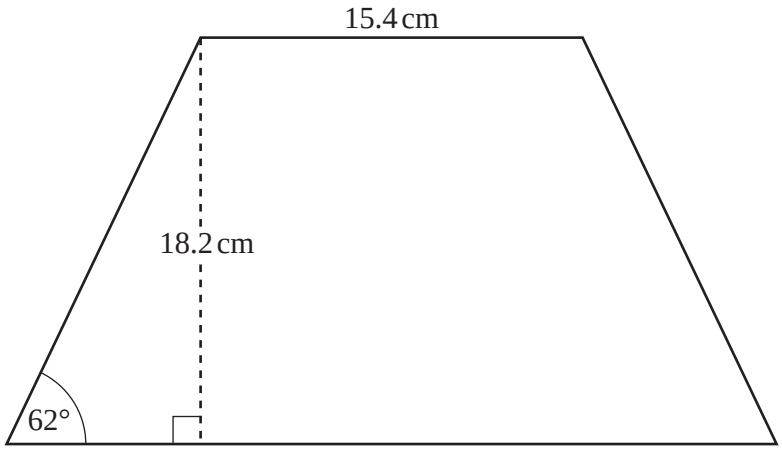
NOT TO SCALE

A, *B* and *C* are points on a circle, centre *O*.
DA and *DC* are tangents.
Angle *ADC* = 44°.

Work out the value of *x*.

x = ... [3]

14



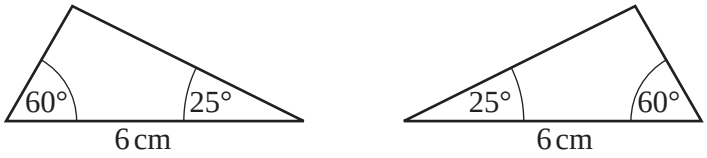
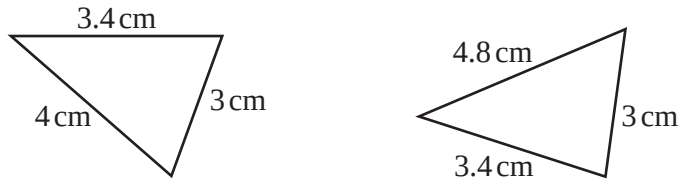
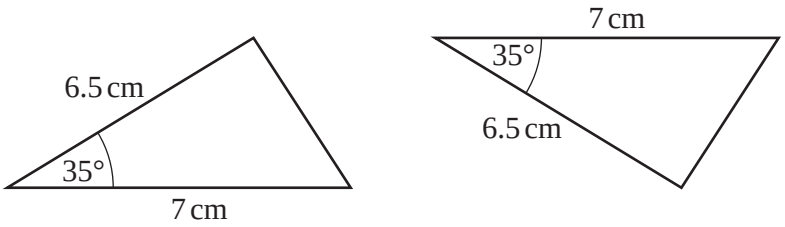
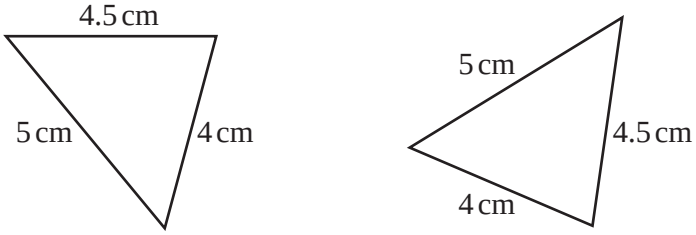
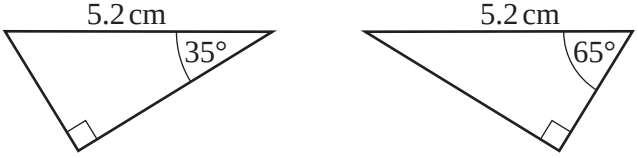
NOT TO SCALE

The diagram shows a trapezium.
The trapezium has one line of symmetry.

Work out the area of the trapezium.

..... cm^2 [4]

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
	Congruent	ASA
	Not congruent	None
		
		
		

[3]

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]

17 Find the gradient of the line that is perpendicular to the line $3y = 4x - 5$.

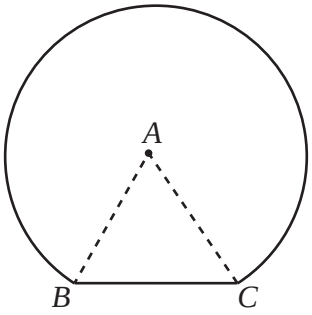
..... [2]

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

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

$x =$ ..... [4]

19 (a)



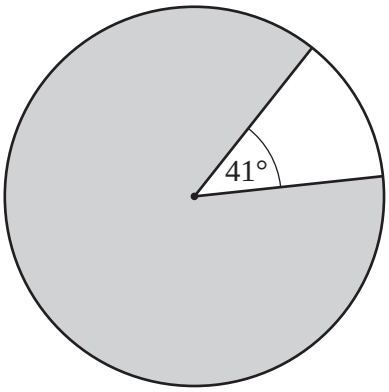
NOT TO SCALE

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)



NOT TO SCALE

The diagram shows two sectors of a circle.
The major sector is shaded.
The area of the major sector is 74.5 cm^2.

Calculate the radius of the circle.

..... cm [3]

20 Expand and simplify.

$$(x-2)(2x+5)(x+3)$$

..... [3]

21 The force of attraction, F Newtons, between two magnets is inversely proportional to the square of the distance, d cm, between the magnets.

When $d = 1.5$, $F = 48$.

(a) Find an expression for F in terms of d.

$F =$ ..... [2]

(b) When the distance between the two magnets is doubled the new force is n times the original force.

Work out the value of n.

$n =$ ..... [1]

22 Simplify.

$$\frac{2x^2 - 5x - 12}{3x^2 - 12x}$$

..... [4]

23 Find all the solutions of $4\sin x = 3$ for $0° \leqslant x \leqslant 360°$.

..... [2]

24 Solve.

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

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

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