

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS A

Foundation Paper 2

Specimen

Candidates answer on the question paper.

Time: 2 hours

Additional Materials:

- Calculator
- Geometrical instruments
- Tracing paper (optional)

F **J512/2**

Candidate
Name

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Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show all your working. Marks may be given for working that shows you know how to solve the problem even if you get the answer wrong.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

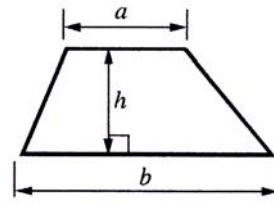
- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is 100.
- Unless otherwise instructed take π to be 3.142 or use the π button on your calculator.

For Examiner's Use	
Total	

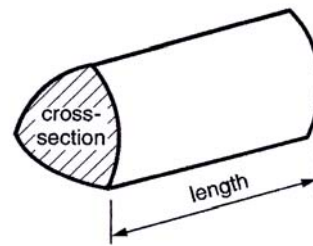
This document consists of **21** printed pages.

FORMULAE SHEET

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) length



1

5	8	60	192
6	25	180	

From these numbers write down

- (a) the smallest even number, (a)[1]
- (b) a square number, (b)[1]
- (c) a multiple of 20, (c)[1]
- (d) a factor of 18, (d)[1]
- (e) a common factor of 48 and 64.

.....

(e)[1]

2 Charlie was asked to write down 5 fractions that were equivalent to $\frac{3}{4}$.

Here are his fractions.

$\frac{30}{40}$	$\frac{13}{14}$	$\frac{9}{12}$	$\frac{6}{8}$	$\frac{39}{49}$
.....

Put a tick ✓ under those he got right.

Put a cross ✗ under those he got wrong. [3]

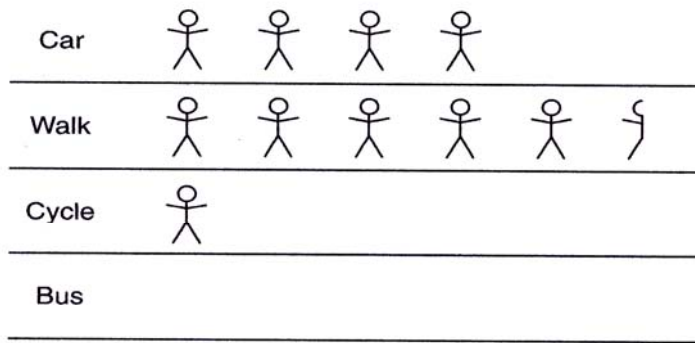
3 The four consecutive numbers 2, 3, 4 and 5 have a total of 14.


Find four consecutive numbers that have a total of 42.

.....

 [3]

4 Bethany is drawing a pictogram to show how the children in Class 2 travel to school.



Key:  represents 2 children

- (a) How many children travel by car? (a) [1]
- (b) How many children walk? (b) [1]
- (c) Three children travel by bus. Show this on the pictogram. [1]

The pictogram is now complete.

- (d) How many children are there in Class 2? (d)..... [2]

5 Complete the sentences below. Use the words from this list.

Impossible Certain Fifty-fifty Likely Unlikely

- (a) It is that one day I will die. [1]
- (b) It isthat I will get a head when I toss a £1 coin. [1]
- (c) It isthat I will build a house on the moon next week. [1]

6 Kerry is paying for her dancing lessons.

Each lesson costs £2.75.

She pays for 12 lessons.

How much change should she get from £40?

.....

.....

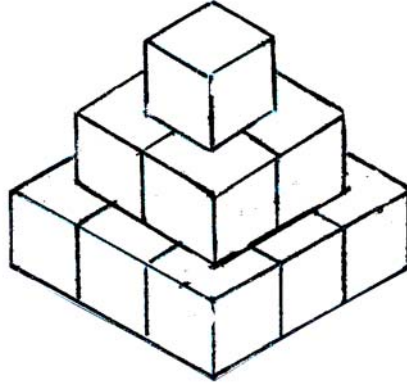
..... [3]

7 Lucy is building a tower with blocks.

She takes a single block and places it in the middle of a square made with 4 blocks.

She then places all of these blocks in the middle of a square made with 9 blocks, as shown in the diagram.

The tower now has three layers.



If Lucy continues in this way, how many blocks will she use altogether to make a tower which has five layers?

.....

.....

.....

.....

.....

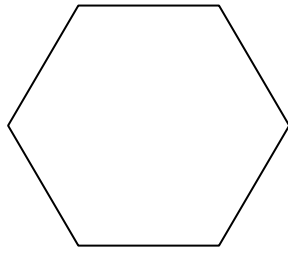
.....

.....

.....

..... [4]

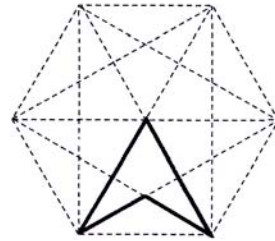
- 8 (a) What is the mathematical name of this shape?



(a) [1]

- (b) When you draw all the diagonals on this shape, you can use them to find lots of other shapes.

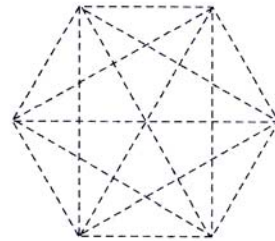
Here for example is an arrowhead.



Draw the following shapes.

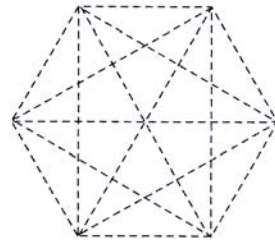
You are only allowed to draw on the dotted lines.

- (i) A rectangle.



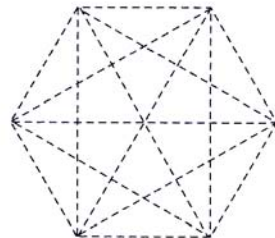
[1]

- (ii) An equilateral triangle.



[1]

- (iii) A kite.



[1]

9 A local supermarket has the following offers.

Water filters	£3.49 each	3 for the price of 2
Bonus points		1 for every complete £1 spent
Computer vouchers		1 for every complete £10 spent

Fill in the gaps in the bill below.

Item	Number Needed	Cost	Cost (£)
Box of cornflakes	2	£1.39 each	2.78
Bottle of olive oil.	3	£7.79 each	23.37
Lemons	24p each	1.20
Water Filter	3	<i>See offer above</i>
		Total cost	34.33
		Bonus points
		Computer vouchers

[4]

10 Pranav wrote down all the numbers between 1 and 99.

How many times did he use the digit 2?

.....

.....

.....

.....

.....

.....

.....

..... [3]

- 11 John and Janet each want to hire a carpet cleaner. They see this sign showing how to work out the cost in pounds.

Number of Days	x	3	+	5	=	Cost
----------------------	---	---	---	---	---	------

- (a) How much would it cost John to hire the cleaner for 3 days?

.....
 (a) £ [2]

- (b) Janet pays £20 to hire the cleaner. For how many days did she hire the cleaner?

.....

 (b) [2]

- 12 The number 9116 is a special number.

It reads the same upside down. (Turn your paper round and see.)

Write down two other four-digit numbers that read the same upside down.

Try to use some different digits.

.....

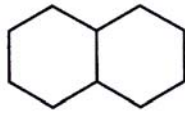
 First answer
 Second answer [4]

13

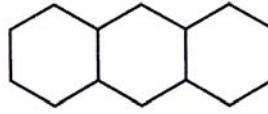
Pattern 1



Pattern 2



Pattern 3



(a) Complete the table below.

Pattern Number	1	2	3	4	5
Number of lines	6	11	16		

[2]

(b) How many lines would be needed for Pattern 10?

.....

(b) [1]

(c) Susie is trying to work out how many lines would be needed for Pattern 100. She says

“Pattern 1 has 6 lines so Pattern 100 would need $100 \times 6 = 600$ lines.”

Is Susie right or wrong?

Give a reason for your answer.

Susie is because

.....

[2]

(d) Work out the n^{th} term of the sequence.

.....

(d) [2]

14 A teacher gives his class this problem.

"Find 4 digits to go in these boxes to make a correct calculation."

$$\square \square \times 5 = \square \square$$

(a) Beki correctly uses the four digits 0, 1, 4 and 7.

Show how she does this calculation.

$$\square \square \times 5 = \square \square$$

[2]

(b) Sam tries to use the digits 1, 3, 4 and 7.

Explain why these digits will not work.

.....
 [1]

(c) Richard changes the 5 to a 10.

$$\square \square \times 10 = \square \square$$

Explain why it is not possible to find 4 different digits to make this a correct calculation.

.....
 [1]

15 (a) Simplify.

(i) $8q - 5q$

.....
(a)(i) [1]

(ii) $6q + 2r - q + 7r$

.....
(ii) [2]

(b) Use the formula

$H = 9m - 5$

to find H when $m = 13.4$.

.....
(b) [2]

(c) Solve.

(i) $\frac{x}{3} = 9$

(c)(i) $x =$ [1]

(ii) $3x + 2 = x + 7$

.....
.....
(ii) $x =$ [3]

16 Geoff has a scanner on his computer to check for viruses.

The scanner can check 54 files in a second.

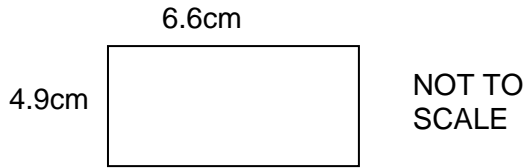
There are 96 279 files on his computer to check.

How long will it take the scanner to check all the files?

Give your answer in minutes, to the nearest minute.

.....
.....
.....
.....minutes [4]

17 This rectangle is 6.6 cm long by 4.9 cm wide.



(a) Work out

(i) the perimeter of the rectangle,

.....
(a)(i)cm [1]

(ii) the area of the rectangle.

.....
(ii) cm² [2]

(b) The rectangle is the base of a cuboid of height 25 cm.
 Calculate the volume of the cuboid.

.....
(b) cm³ [2]

(c) The rectangle is enlarged with scale factor 6.

(i) Work out the length and width of the enlarged rectangle.

.....

(c)(i) Lengthcm [1]
 Widthcm [1]

(ii) How many times bigger is the area of the enlarged rectangle than the area of the small rectangle?

.....

(ii) [2]



Here is a recipe for rice custard for 4 people.

<i>Baked Rice Custard</i>	
Pudding rice	40 g
Eggs	2
Sugar	50 g
Vanilla essence	½ tsp
Milk	500 ml
Sultanas	1 cupful

Fill in the table so that the recipe would be enough for 6 people.

<i>Baked Rice Custard</i>	
Pudding rice	
Eggs	
Sugar	
Vanilla essence	
Milk	
Sultanas	

.....

.....

..... [4]

19 (a) The marks of 20 students in a chemistry test are shown below.

42 58 62 92 81 43 75 57 40 46 59 58 63 51 86 84 68 53 90 80

Write this data in an **ordered** stem and leaf diagram.

4	
5	
6	
7	
8	
9	

[3]

(b) The distribution of the times that each of 97 students take to travel to school is given in the table.

Time (t minutes)	Number of Students
$0 < t \leq 10$	47
$10 < t \leq 20$	14
$20 < t \leq 30$	23
$30 < t \leq 40$	13

(i) Write down the modal class.

(b)(i).....[1]

(ii) Which class contains the median?

Explain how you found your answer.

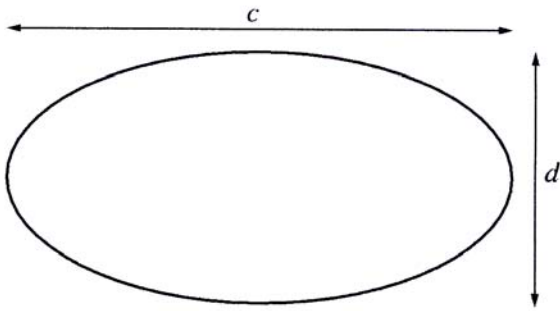
Class because [2]

(iii) Calculate an estimate of the mean time taken to travel to school by these 97 students.

.....

(iii) [4]

20 The shape drawn below is an ellipse.



(a) Its area A is given by the formula

$$A = \frac{\pi cd}{4}$$

Calculate the value of A when $c = 10.6$ cm and $d = 6.4$ cm.

.....

(a) cm^2 [2]

(b) Calculate the area of a circle with radius 3.2 cm.

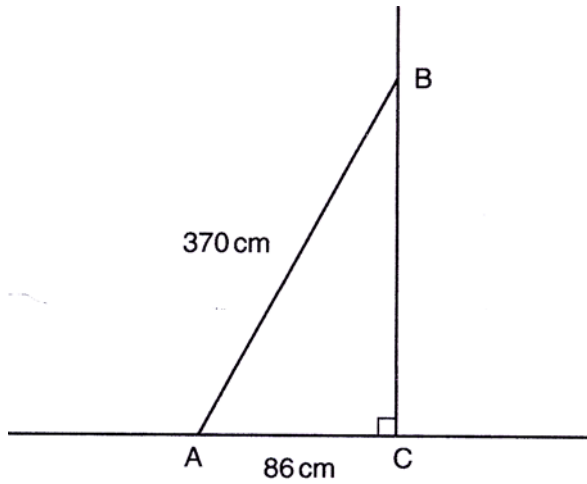
.....

(b) cm^2 [2]

21 The diagram represents a ladder AB leaning against a vertical wall.

The ladder is 370 cm long.

The ground AC is horizontal and the bottom of the ladder is 86 cm from the foot of the wall.



NOT TO
SCALE

Calculate the length BC.

Give your answer to a sensible degree of accuracy.

.....
.....
.....
.....

.....cm [4]



OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education


MATHEMATICS A

Foundation Paper 2

Specimen Mark Scheme

J512/2

The maximum mark for this paper is 100.

1 (a)	6	1						
(b)	25	1						
(c)	60 or 180	1						
(d)	6	1						
(e)	8	1						
2	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="text-align: center;">✓</td> <td style="text-align: center;">✗</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✗</td> </tr> </table>	✓	✗	✓	✓	✗	3	B2 for 3 or 4 correct B1 for 1 or 2 correct
✓	✗	✓	✓	✗				
3	9, 10, 11, 12	3	M1 for adding cons numbers M1 for adding 4 numbers					
4 (a)	8	1						
(b)	11	1						
(c)		1						
(d)	24	2	M1 8 + 11 + 2 + 3					
5 (a)	Certain	1						
(b)	Fifty-fifty	1						
(c)	Impossible	1						
6	7	3	M1 12 x 2.75 (= 33) M1 40 – <i>their</i> 33					
7	55	4	B1 for sight of 16 B1 for sight of 25 M1 for adding 5 layers					
8 (a)	(Regular) Hexagon	1						
(b) (i)	Rectangle drawn	1						
(ii)	Equilateral triangle drawn	1						
(iii)	Kite drawn	1						
9	5 lemons	1						
	6.98	1						
	34	1						
	3	1						
10	20	3	M1 for lists of numbers M1 for adding 2s					
11 (a)	14	2	M1 3 x 3 + 5					
(b)	5	2	M1 Sight of 15					

12	First correct 4 fig number Second correct 4 fig number Use of 0 (or 8 [condone])	2 1 1	SC1 or 2 for each of 2 'correct' answers, but not 4 figures
13 (a)	21 26	2	B1 for 1 correct (second ft from first)
(b)	51	1	
(c)	Wrong There aren't 6 extra lines each time etc.	1 1	It should be 501
(d)	$5n + 1$	2	B1 for use of $5n$
14 (a)	14 700	2	B1 0 in final box
(b)	Must end in a 5 or a 0	1	
(c)	2 digit x 10 = one 3 digit oe	1	
15 (a) (i)	$3q$	1	
(ii)	$5q + 9r$	2	B1 either term
(b)	115·6	2	M1 for $9 \times 13\cdot4 (= 120\cdot6)$
(c) (i)	27	1	
(ii)	$(x =) 2\cdot5$	3	M1 $2x + 2 = 7$ oe or $3x = x + 5$ oe $2x = 5$
16	30	4	M1 $96279 \div 54$ M1 $\div 60$ A1 29·7 ... B1 ✓ Rounding <i>their</i> answer
17 (a) (i)	23	1	
(ii)	32·34	2	M1 for $6\cdot6 \times 4\cdot9$ SC1 for two correct but reversed answers
(b)	808·5	2 ✓	
(c) (i)	39·6 by 29·4	2	1 each (condone reversed)
(ii)	36	2	1 for 6^2 or <i>their</i> c(i) product \div <i>their</i> (a)(ii)

18	Pudding rice 60 (g) Eggs 3 Sugar 75 (g) Vanilla essence $\frac{3}{4}$ tsp Milk 750 ml Sultanas $1\frac{1}{2}$ cupfuls	4	-1 each error or omission
19 (a)	0236 137889 238 5 0146 02	3 all ok	B2 for 4 or 5 rows correct B1 for 2 or 3 rows correct OR SC1 for unordered diagram, at least 3 rows correct
(b)	(i) $0 < t \leq 10$ (ii) $10 < t \leq 20$ $\frac{1}{2}$ of $(97 + 1) = 49$ 49 th in $47 + 14$	B1 B1	
	(iii) 15.2(or 15 with working)	B1 4	M1 Use of midpoints x f M1 1475 M1 $\div 97$
20	53.3 or 53 32.2	2 2	M1 $\pi \times 10.6 \times 6.4 \div 4$ M1 $\pi \times 3.2^2$
21	35986 ...g 360	3 B1✓	M1 3702 – 862 M1 $\sqrt{129504}$

Assessment Objectives Grid

Question	AO2	AO3	AO4	Total
1	5			
2	3			
3	3			
4			5	
5			3	
6	3			
7		4		
8		4		
9	4			
10	3			
11	4			
12		4		
13	7			
14	4			
15	9			
16	4			
17		9		
18	4			
19			10	
20		4		
21		4		
Totals	53	29	18	100