AQA

Centre number						Candidate number				

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

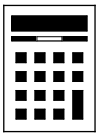
Foundation Tier Paper 3 Calculator

Shadow paper based on November 2023 question paper

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.



Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24	
TOTAL	

Answer **all** questions in the spaces provided.

Do not write outside the box

1 Work out 10% of 240

[1 mark]

Answer _____

2 Write down the value of the digit 5 in 25 013

[1 mark]

Answer _____

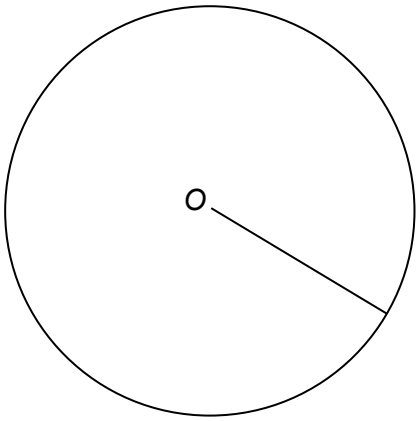
Do not write outside the box

3 (a) Write down the name of a triangle with two **equal** sides.

[1 mark]

Answer _____

3 (b) Write down the name for the straight line inside this circle.



[1 mark]

Answer _____

4 Write down **all** the factors of 50

[2 marks]

_____

_____

_____

_____

Answer _____

6

Turn over ►

Do not write outside the box

5 (a) $d = g^2 - 3h$

Work out the value of d when $g = 13$ and $h = 24$

[2 marks]

$d =$ _____

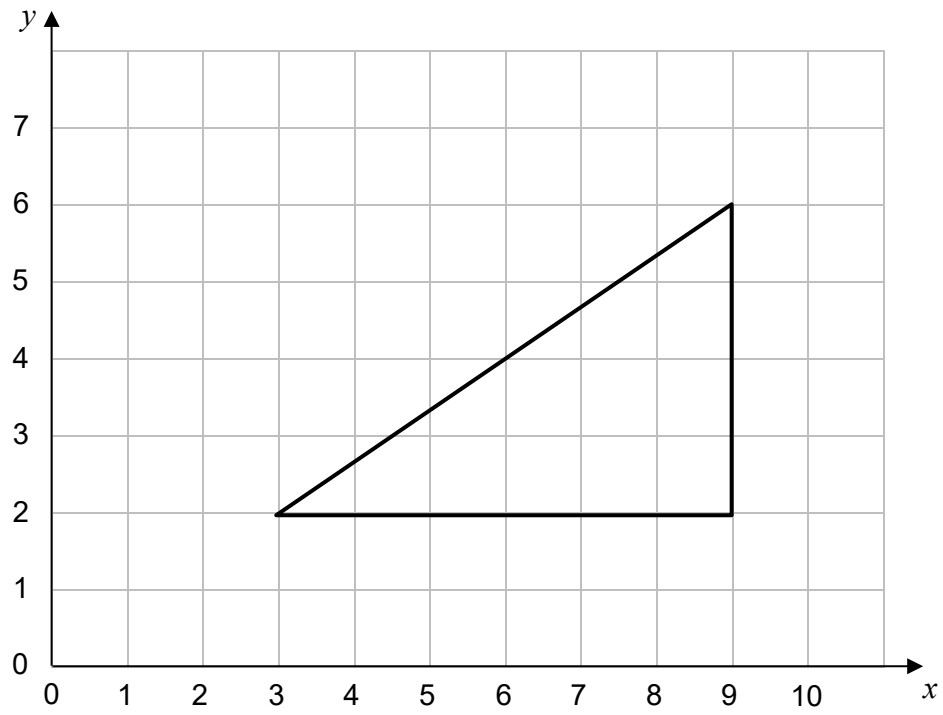
5 (b) Rearrange $p = q - r$ to make q the subject.

[1 mark]

$q =$ _____

Do not write outside the box

6 Here is a right-angled triangle on a centimetre grid.



6 (a) Write down the coordinates of the midpoint of the **longest** side.

[1 mark]

Answer (_____ , _____)

6 (b) Work out the area of the triangle.

[1 mark]

Answer _____ cm^2

Turn over for the next question

5

Do not write outside the box

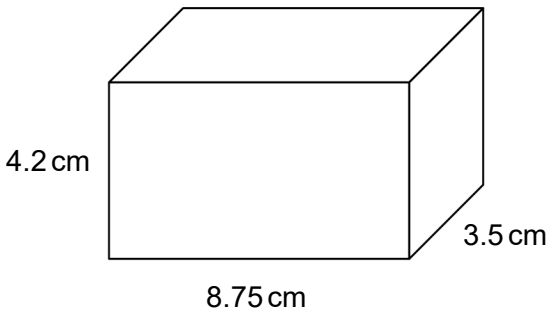
7 The total cost of broadband for 4 months is £140.80

At the same monthly rate, work out the total cost of broadband for 2 **years**.

[3 marks]

Answer £ _____

8 Here is a cuboid.



Work out the volume of the cuboid.

Give your answer to 1 decimal place.

[2 marks]

Answer _____ cm^3

Do not write outside the box

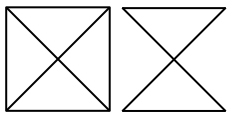
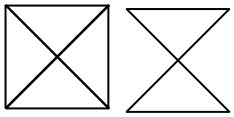
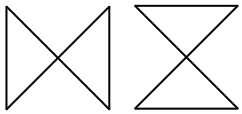
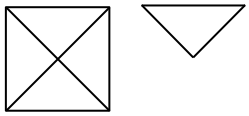
9 Nancy asked 20 people to name their favourite school lesson.

Here are the results.

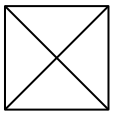
Mathematics	6
English	5
Art	4
PE	5

Nancy drew this pictogram to represent the results.

Favourite Lesson

Mathematics	
English	
Art	
PE	

Key

 = 4 students

What **two** mistakes has Nancy made?

[2 marks]

Mistake 1 _____

_____

Mistake 2 _____

_____

7

Turn over ►

Do not write outside the box

10 Neeru buys 2.4 kg of carrots and 5 kg of broccoli.

The total cost is £9.86

The carrots cost £1.65 per kg

Work out the cost per kg of the broccoli.

[4 marks]

Answer £ _____ per kg

Do not write outside the box

11 (a) Simplify fully $4x + 2y + 6 + 9x - 6y - 10$

[3 marks]

Answer _____

11 (b) Circle the expression that is equivalent to $1.5a^3$

[1 mark]

$\frac{a^3}{5}$ $\frac{3a^3}{2}$ $\frac{3}{2a^3}$ $\frac{1.5}{a^3}$

Turn over for the next question

8

Turn over ►

Do not write outside the box

12 Here are the options available at a pizza restaurant.

Base	Topping 1	Topping 2	Topping 3
Thin (T)	Pepperoni (P)	Mushrooms (M)	Sausage (S)
Crispy (C)	Ham (H)	Anchovies (A)	Black Olives (B)
Deep Pan (D)	Onion (O)	Green Pepper (G)	Feta (F)

Customers choose a **base** and **two** toppings.

They **cannot** choose more than one topping from a column.

Stuart decides

to have a **thin** base

not to have ham, green peppers, anchovies or black olives.

By listing, show that there are **eight** possible pizza combinations Stuart can choose.

[3 marks]

Base	Topping	Topping

Do not write outside the box

13 There are 1200 students at a college.

A student is chosen at random.

13 (a) The probability that the student is taking a GCSE resit is 0.11

How many of the students are taking a GCSE resit?

[2 marks]

Answer _____

13 (b) The probability that the student is studying

History is 0.45

English is 0.68

Show that some students are studying History **and** English.

[2 marks]

Turn over for the next question

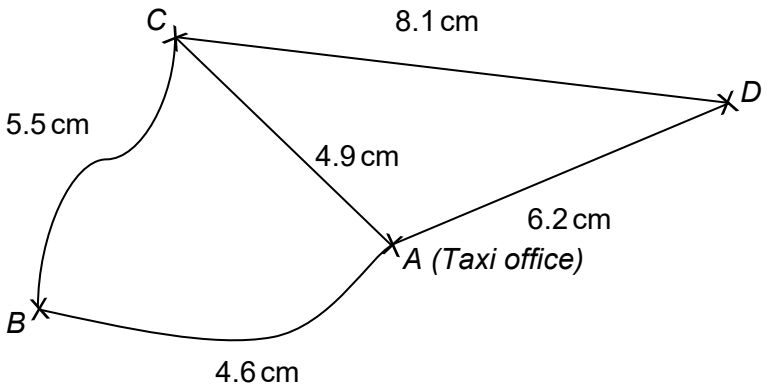
7

Do not write outside the box

14 Dave drives a taxi. His office is based at location A. He drops people off at houses B , C and D.

Scale: 1 cm represents 2.5 miles

Not drawn accurately



Dave drives

from A to B and back

and

from A to C, then C to D, then D to A.

Dave is paid

45p for each mile he drives

and

£2.15 for each house he visits (B, C or D).

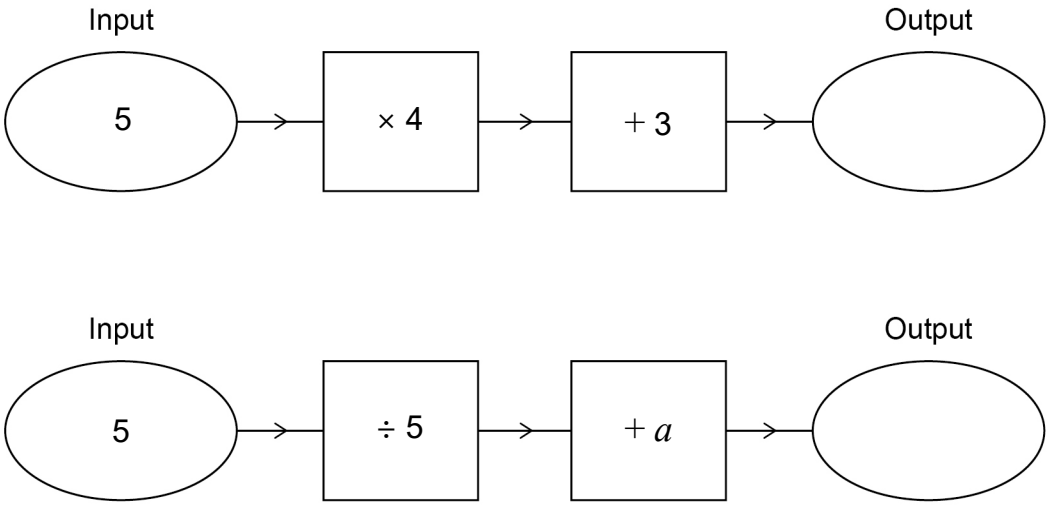
How much is Dave paid in total for this work?

[4 marks]

Answer £ _____

Do not write outside the box

15 Here are two number machines.



The outputs are the same.

Work out the value of a.

[4 marks]

$a =$ _____

8

Turn over ►

Do not write outside the box

16 Which is closer in value to 1.5

$$\frac{9}{10} \text{ or } 2\frac{1}{8} ?$$

You **must** show your working.

[3 marks]

Answer _____

Do not write outside the box

17 A computer game has five levels.

Each level has a maximum number of points.

These maximum numbers form an **arithmetic progression**.

The table shows the numbers for the first three levels.

Level 1	865
Level 2	1000
Level 3	1135
Level 4	
Level 5	

Your score is the **total** of the points you achieve in **each** of the five levels.

Janice's best score is 1000 points **less** than the highest possible score.

Work out her best score.

[4 marks]

Answer _____

7

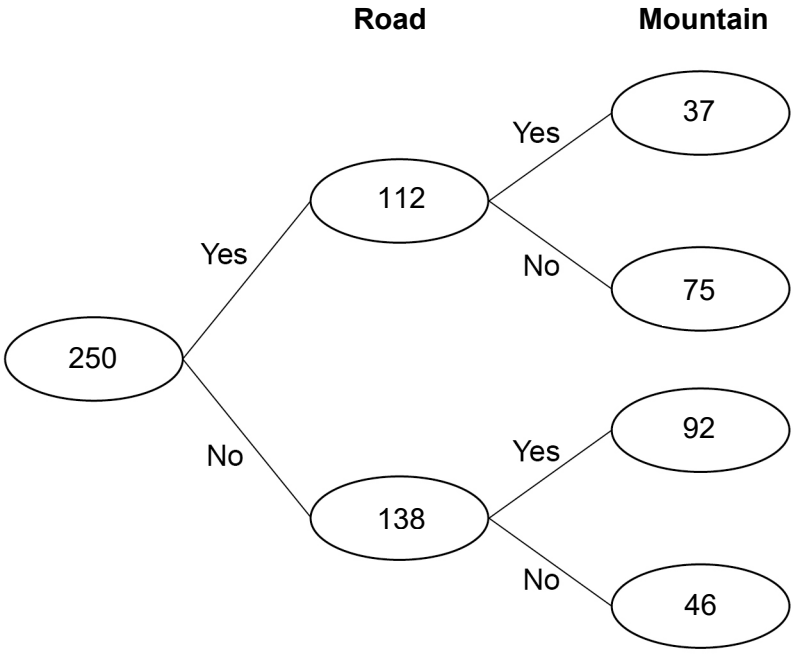
Turn over ►

Do not write outside the box

18 A cycling club has 250 members.

One weekend, the club organised a road cycling event and a mountain biking event.

The frequency tree shows how many members participated in each event.



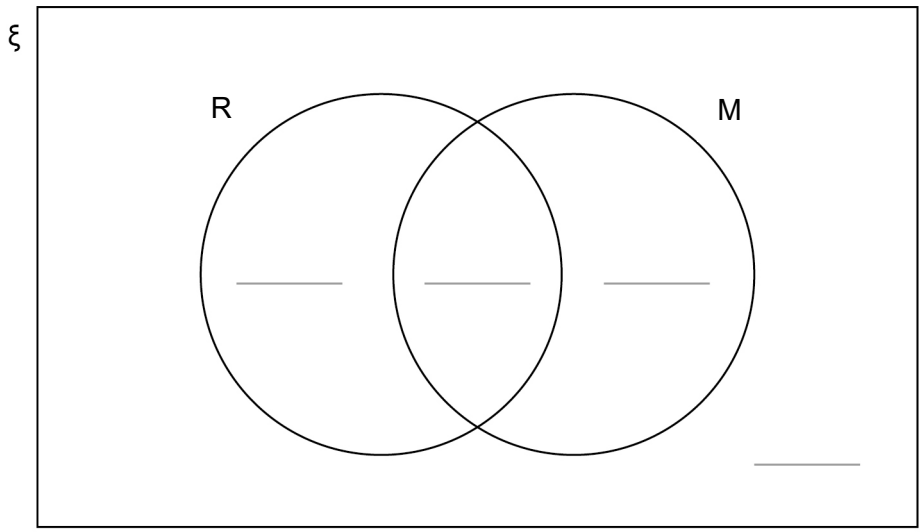
Represent this information on the Venn diagram.

[4 marks]

ξ = 250 members.

R = members who participated in the road cycling event.

M = members who participated in the mountain biking event.



Do not write outside the box

19 The length of a line is 15 cm to the nearest centimetre.

Complete the error interval.

[2 marks]

Answer _____ cm $\leqslant$ length $<$ _____ cm

20 Which of these is an estimate?

Tick **one** box.

[1 mark]

- ☐ highest value of **ungrouped** data
- ☐ range of **ungrouped** data
- ☐ median class of **grouped** data
- ☐ mean of **grouped** data

Turn over for the next question

7

Do not write outside the box

21 Annette's total annual pay = salary + bonus

	Salary	**Bonus**
Last year	£24 000	£3000
This year	3% increase	7% decrease

Work out the percentage change in her total annual pay.

State whether it is an increase or a decrease.

[4 marks]

Answer _____

Do not write outside the box

22 The first two square numbers are 1 and 4

Show that

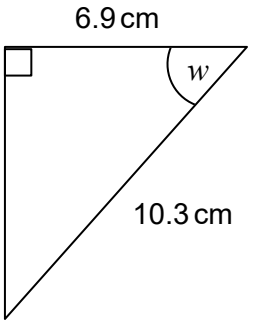
the 5th square number can be written as the sum of three different prime numbers.

[3 marks]

□ = □ + □ + □

23 Use trigonometry to work out the size of angle w.

[3 marks]



Not drawn accurately

$w =$ _____ °

10

Turn over ►

Do not write outside the box

24 Two bags contain only green discs and yellow discs.

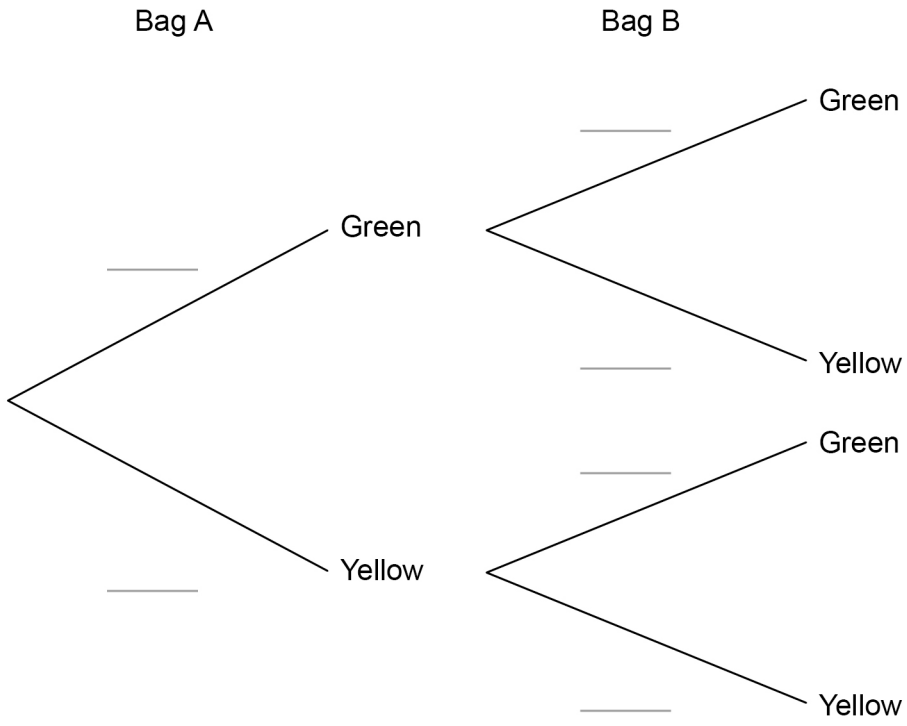
Bag A contains 2 green discs and 3 yellow discs.

Bag B contains 1 green disc and 9 yellow discs.

One disc is picked at random from each bag.

24 (a) Complete the tree diagram with the correct probabilities.

[2 marks]



24 (b) Work out the probability that **both** discs are yellow.

[2 marks]

Answer _____

Do not write outside the box

25 Solve these simultaneous equations.

$$10x + 5y = 117$$
$$x + 5y = 18$$

[3 marks]

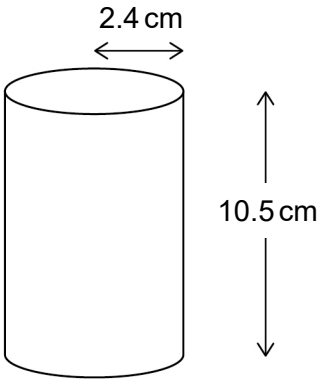
$x =$ _____ $y =$ _____

Turn over for the next question

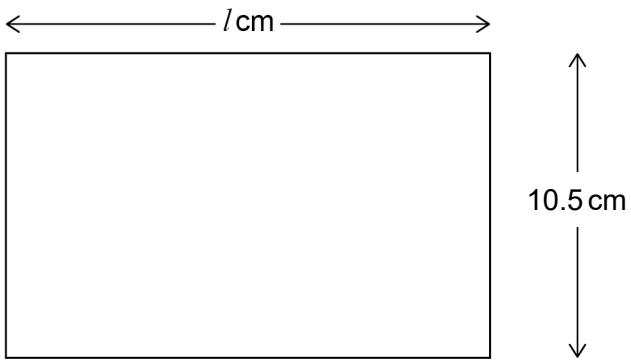
7

Do not write outside the box

26 An open cardboard cylinder has radius 2.4 cm and height 10.5 cm



26 (a) Patrick assumes that the net of the cylinder is a rectangle with length l cm



Not drawn accurately

Work out the area of this rectangle.

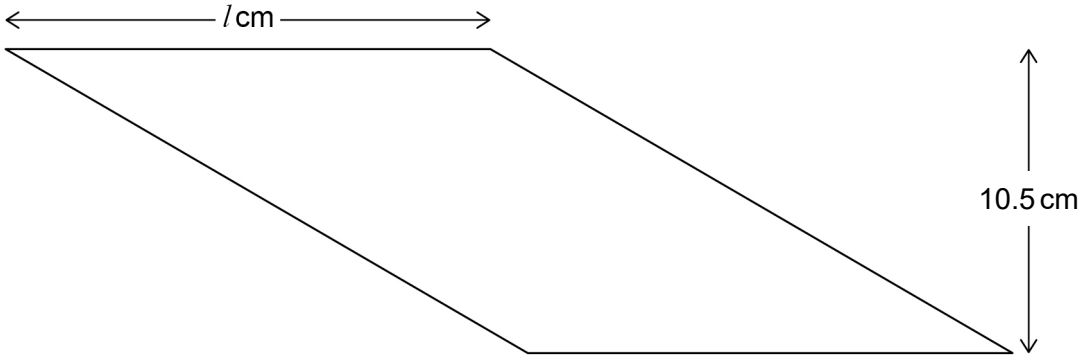
[3 marks]

Answer _____ cm^2

Do not write outside the box

In fact, the net is a parallelogram, not a rectangle.

Not drawn accurately



26 (b) What does this mean about the **area** of the net?

Tick **one** box.

[1 mark]

- ☐ It is less than the area of the rectangle
- ☐ It is equal to the area of the rectangle
- ☐ It is more than the area of the rectangle

26 (c) What does this mean about the **perimeter** of the net?

Tick **one** box.

[1 mark]

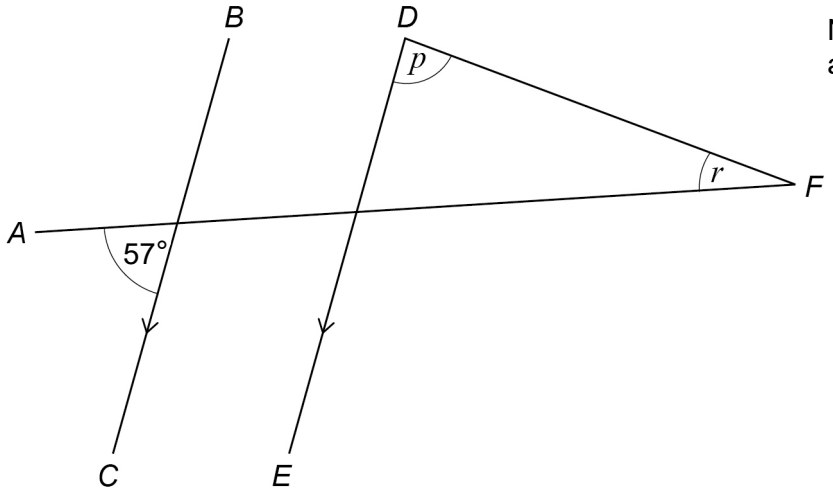
- ☐ It is less than the perimeter of the rectangle
- ☐ It is equal to the perimeter of the rectangle
- ☐ It is more than the perimeter of the rectangle

5

Do not write outside the box

27 *AF*, *BC*, *DE* and *DF* are straight lines.

BC and *DE* are parallel.



p is two times r.

Work out the size of angle p.

[3 marks]

$p =$ _____ °

END OF QUESTIONS

3

Do not write outside the box

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

Do not write outside the box

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED