

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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I declare this is my own work.

# GCSE MATHEMATICS

# F

Foundation Tier      Paper 3      Calculator

Monday 13 November 2023

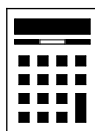
Morning

Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:

- a calculator
- mathematical instruments
- the Formulae Sheet (enclosed).



## 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	
<b>TOTAL</b>	



N 0 V 2 3 8 3 0 0 3 F 0 1

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

*Do not write  
outside the  
box*

**1** Work out 10% of 170

**[1 mark]**

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Answer \_\_\_\_\_

**2** Write down the value of the digit 7 in 34 728

**[1 mark]**

Answer \_\_\_\_\_

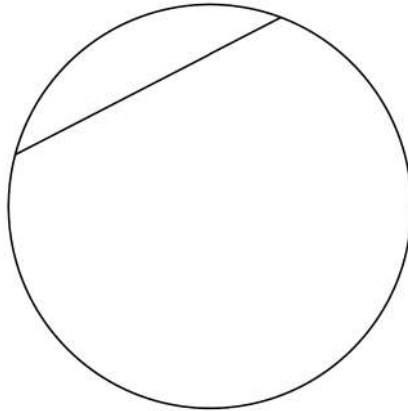


- 3 (a) Write down the name of a triangle with three **equal** sides.

[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 45

[2 marks]

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Answer \_\_\_\_\_



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

Work out the value of  $d$  when  $g = 15$  and  $h = 63$

[2 marks]

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$$d = \underline{\hspace{10cm}}$$

5 (b) Rearrange  $m = n + k$  to make  $n$  the subject.

[1 mark]

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$$n = \underline{\hspace{10cm}}$$



- 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 \_\_\_\_\_  $\text{cm}^2$

Turn over for the next question



7 The total cost of broadband for 5 months is £99.20

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

[3 marks]

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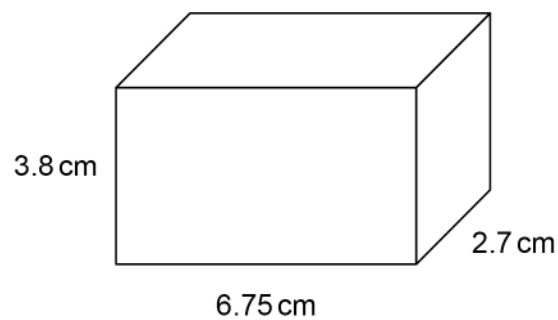
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Answer £ \_\_\_\_\_

8 Here is a cuboid.



Work out the volume of the cuboid.

Give your answer to 1 decimal place.

[2 marks]

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Answer \_\_\_\_\_  $\text{cm}^3$


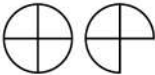
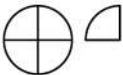



- 9 Nicki asked 30 people to name their favourite crisp flavour.  
Here are the results.

Salt and Vinegar	16
Ready Salted	7
Cheese and Onion	5
Prawn Cocktail	2

Nicki drew this pictogram to represent the results.

**Favourite crisp flavour**

Salt and Vinegar	
Ready Salted	
Cheese and Onion	
Prawn Cocktail	

What **two** mistakes has Nicki made?

**[2 marks]**

Mistake 1 \_\_\_\_\_

\_\_\_\_\_

Mistake 2 \_\_\_\_\_

\_\_\_\_\_



**10** Sanjit buys 1.75 kg of potatoes and 4 kg of leeks.

The total cost is £9.03

The potatoes cost 84p per kg

Work out the cost per kg of the leeks.

**[4 marks]**

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Answer £ \_\_\_\_\_ per kg





**11 (a)** Simplify fully  $2x + 9y + 1 + 8x - 5y - 7$

**[3 marks]**

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Answer \_\_\_\_\_

**11 (b)** Circle the expression that is equivalent to  $0.5a^2$

**[1 mark]**

$$a$$

$$\frac{a}{2}$$

$$\frac{a^2}{2}$$

$$\frac{a^2}{4}$$

**Turn over for the next question**



12

Here are the subjects available in year 12 at a school.

Block 1	Block 2	Block 3	Block 4
Maths (M)	Geography (G)	English (E)	Spanish (S)
History (H)	Drama (D)	Physics (P)	Biology (B)
French (F)	Chemistry (C)	ICT (I)	Art (A)

Students choose **three** subjects.

They **cannot** choose more than one subject from a block.

Lian decides

to study Maths

**not** to study Geography, Chemistry, Physics or ICT.

By listing, show that there are **seven** groups of three subjects that Lian could choose.

**[3 marks]**

Subject 1	Subject 2	Subject 3



- 13** There are 1400 students at a college.  
A student is chosen at random.

- 13 (a)** The probability that the student is taking a GCSE resit is 0.09  
How many of the students are taking a GCSE resit?

**[2 marks]**

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Answer \_\_\_\_\_

- 13 (b)** The probability that the student is studying  
A-levels is 0.67  
Core Maths is 0.48  
Show that some students are studying A-levels **and** Core Maths.

**[2 marks]**

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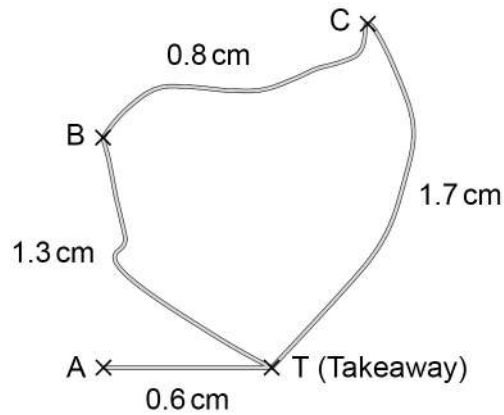
**Turn over for the next question**



- 14 Des delivers takeaways to houses A, B and C.

**Scale:** 1 cm represents 3 miles

Not drawn  
accurately



Des drives

from T to A and back

and

from T to B, then B to C, then C to T.

Des is paid

40p for each mile he drives

and

£1.35 for each house he delivers to.

How much is Des paid in total for this work?

**[4 marks]**

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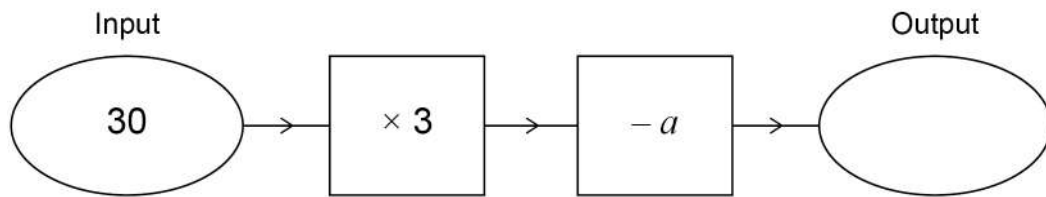
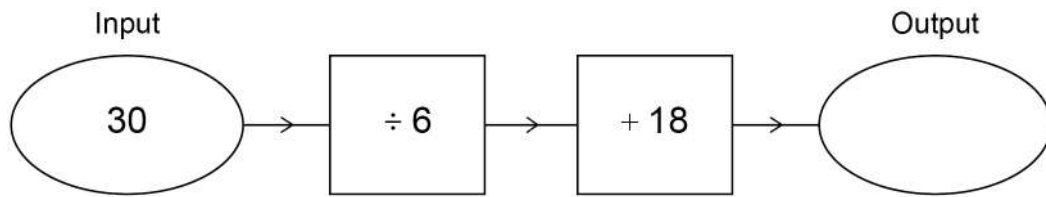
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Answer £ \_\_\_\_\_



15

Here are two number machines.



The outputs are the same.

Work out the value of  $a$ .**[4 marks]**


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 $a =$  \_\_\_\_\_

16

Which is closer in value to 2.5

$$\frac{3}{4} \text{ or } 4\frac{1}{5} ?$$

You **must** show your working.**[3 marks]**

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Answer \_\_\_\_\_



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	400
Level 2	750
Level 3	1100
Level 4	
Level 5	

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

Isaac's best score is 1250 points **less** than the highest possible score.

Work out his best score.

[4 marks]

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Answer \_\_\_\_\_

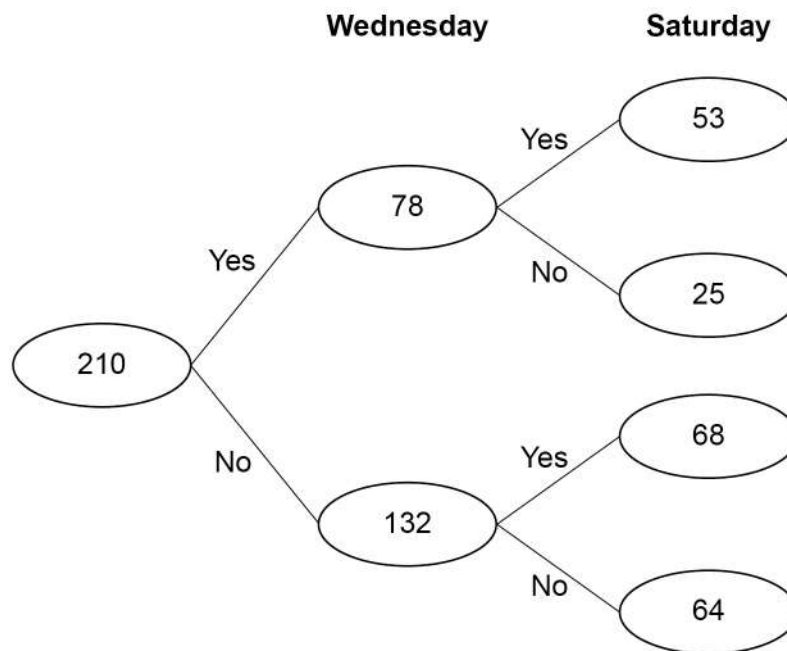


18

A walking group has 210 members.

One week, the group organised a walk on Wednesday and a walk on Saturday.

The frequency tree shows how many members went on the walks.



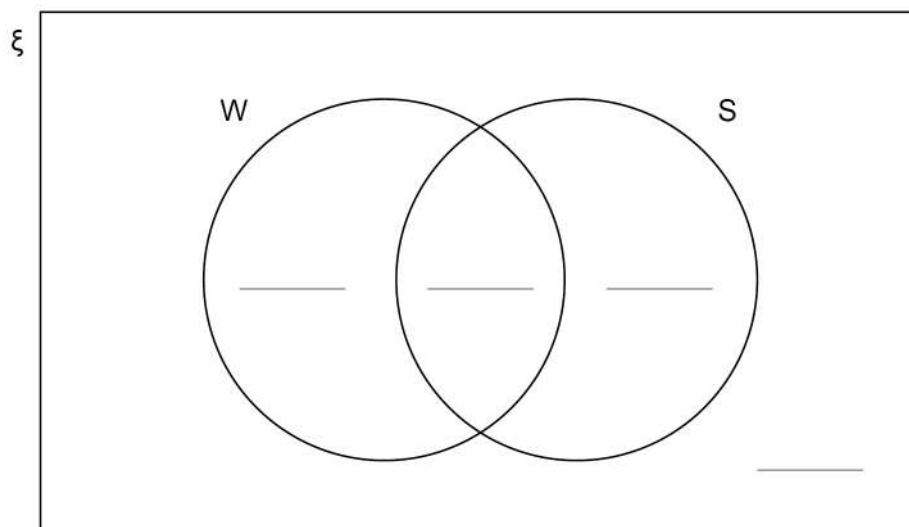
Show the information on the Venn diagram.

[4 marks]

$\xi$  = 210 members

W = members who went on the Wednesday walk

S = members who went on the Saturday walk





19 The length of a line is 8 cm to the nearest centimetre.

Complete the error interval.

[2 marks]

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Answer \_\_\_\_\_ cm  $\leq$  length < \_\_\_\_\_ cm

20 Which of these is an estimate?

Tick **one** box.

[1 mark]

☐

lowest value of **ungrouped** data

☐

range of **ungrouped** data

☐

modal class of **grouped** data

☐

mean of **grouped** data

Turn over for the next question



21

Work out the percentage change in her total annual pay.  
State whether it is an increase or a decrease.

Answer \_\_\_\_\_



22

The first two cube numbers are 1 and 8

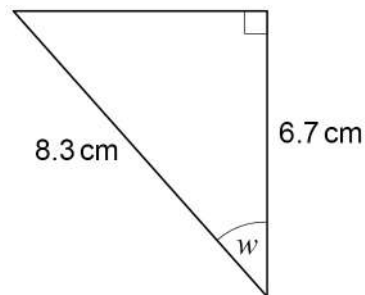
Show that

the 3rd cube number can be written as the sum of three different prime numbers.

**[3 marks]**

$$\square = \square + \square + \square$$

23

Use trigonometry to work out the size of angle  $w$ .**[3 marks]**Not drawn  
accurately

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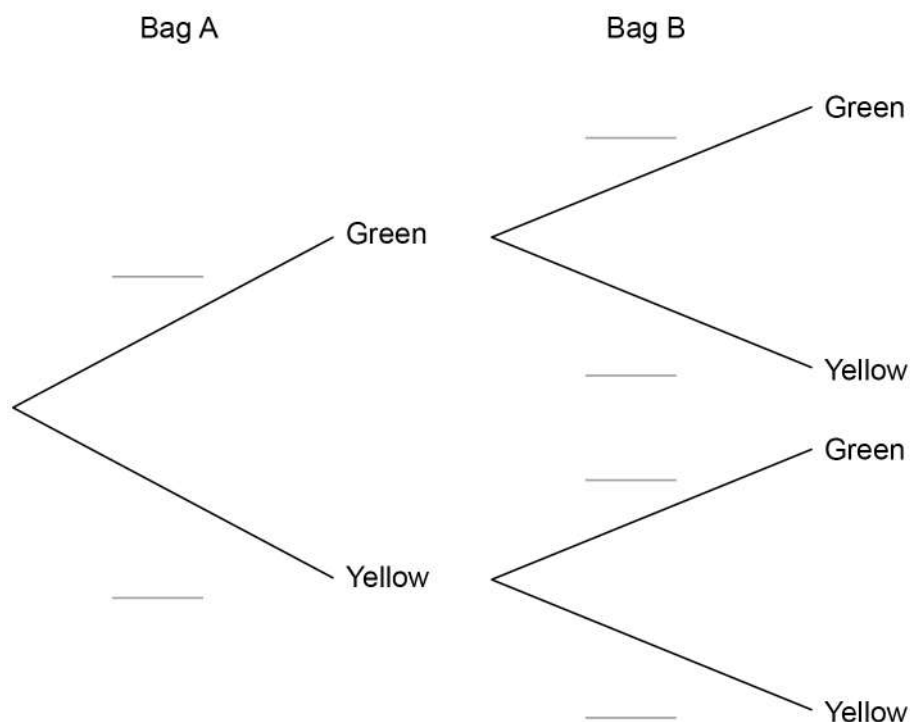
$$w = \text{_____}^\circ$$



- 24** Two bags contain only green discs and yellow discs.  
 Bag A contains 1 green disc and 4 yellow discs.  
 Bag B contains 3 green discs and 7 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 green.

**[2 marks]**

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Answer \_\_\_\_\_



Solve these simultaneous equations.

$$3x + 2y = 48$$

$x =$  \_\_\_\_\_  $y =$  \_\_\_\_\_

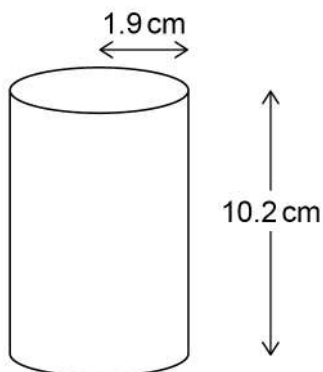
**Turn over for the next question**

7

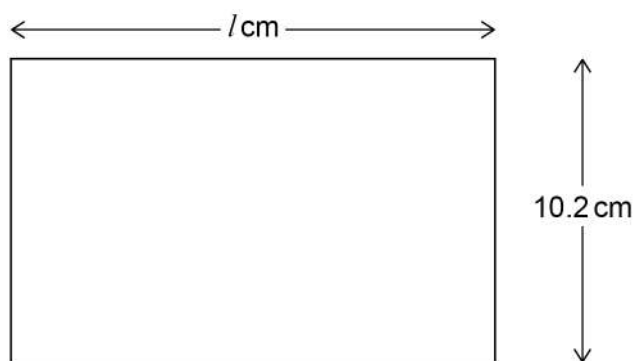
**Turn over ►**



- 26** An open cardboard cylinder has radius 1.9 cm and height 10.2 cm



- 26 (a)** Harry 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]**

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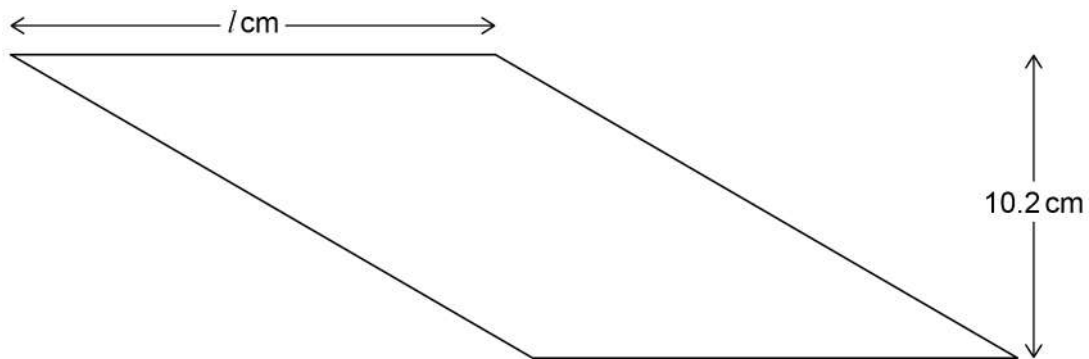
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Answer \_\_\_\_\_  $\text{cm}^2$



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

☐

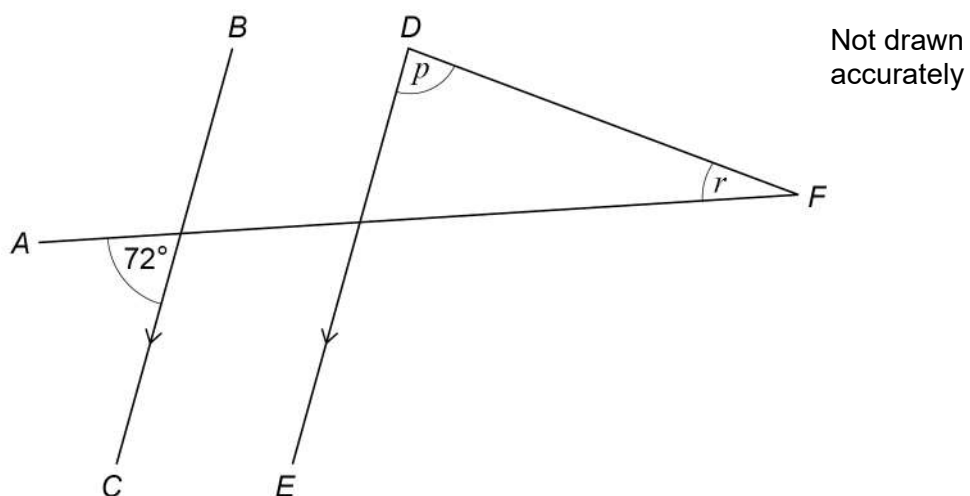
It is more than the perimeter of the rectangle



27

$AF$ ,  $BC$ ,  $DE$  and  $DF$  are straight lines.

$BC$  and  $DE$  are parallel.



$p$  is three times  $r$ .

Work out the size of angle  $p$ .

[3 marks]

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$p =$  \_\_\_\_\_  $^{\circ}$

**END OF QUESTIONS**

