



Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) _____

Candidate signature _____

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.

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	

Advice

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



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]

Answer _____

2 Write down the value of the digit 7 in 34728

[1 mark]

Answer _____

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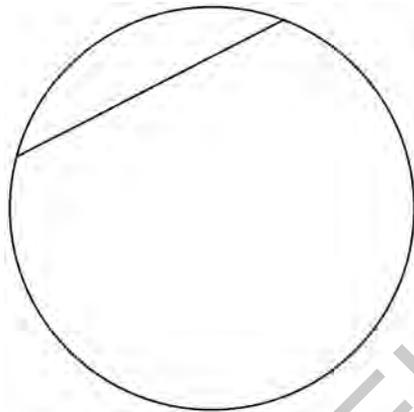


- 3 (a) Write down the name of a triangle with three **equal** sides.

[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]

Answer _____



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

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

[2 marks]

$d =$ _____

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

[1 mark]

$n =$ _____



- 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



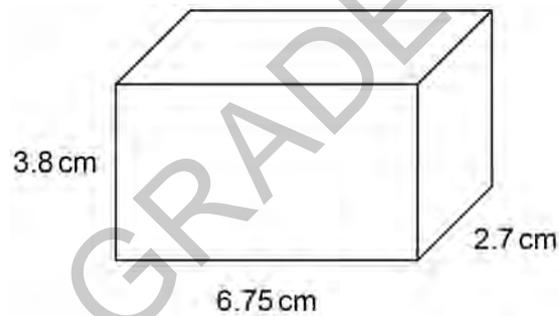
7 The total cost of broadband for 5 months is £99.20

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

[3 marks]

Answer £ _____

8 Here is a cuboid.



Work out the volume of the cuboid.

Give your answer to 1 decimal place.

[2 marks]

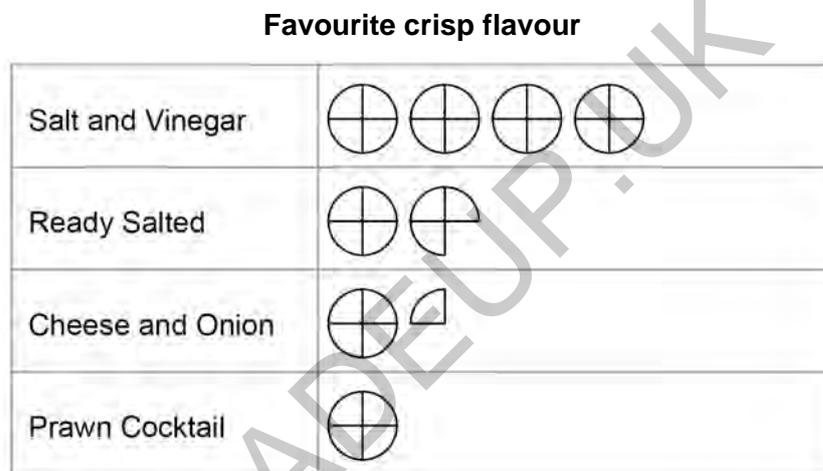
Answer _____ cm^3



- 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.



What **two** mistakes has Nicki made?

[2 marks]

Mistake 1 _____

Mistake 2 _____



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

[3 marks]

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

Turn over ►



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]

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]

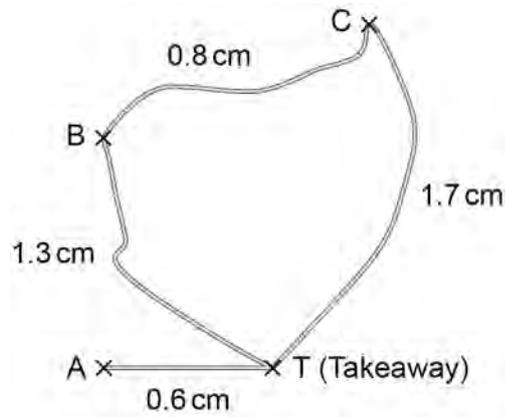
Turn over for the next question



- 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?

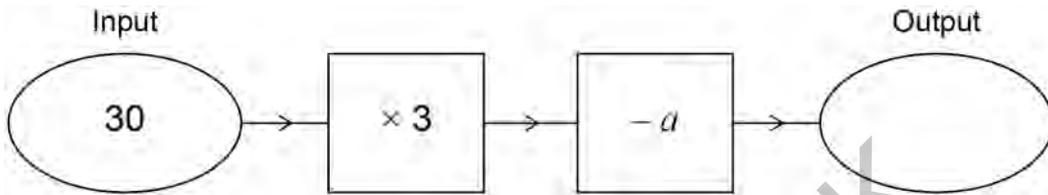
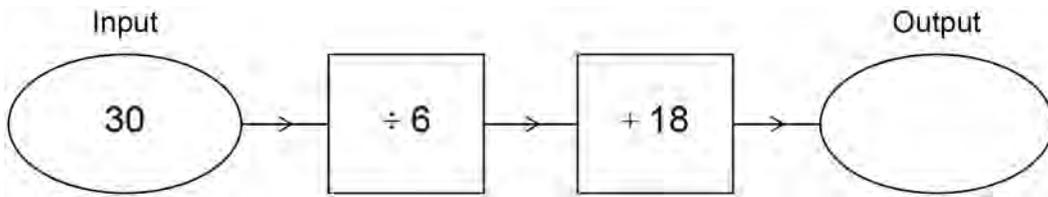
[4 marks]

Answer £ _____



15

Here are two number machines.



The outputs are the same.

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

$$a = \underline{\hspace{10em}}$$



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]

Answer _____

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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]

Answer _____

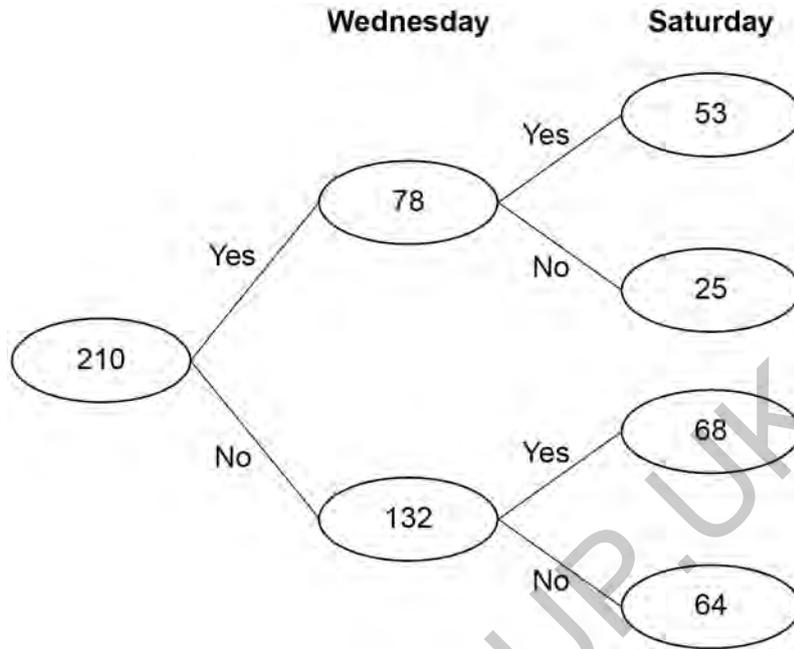
7

Turn over ►



18

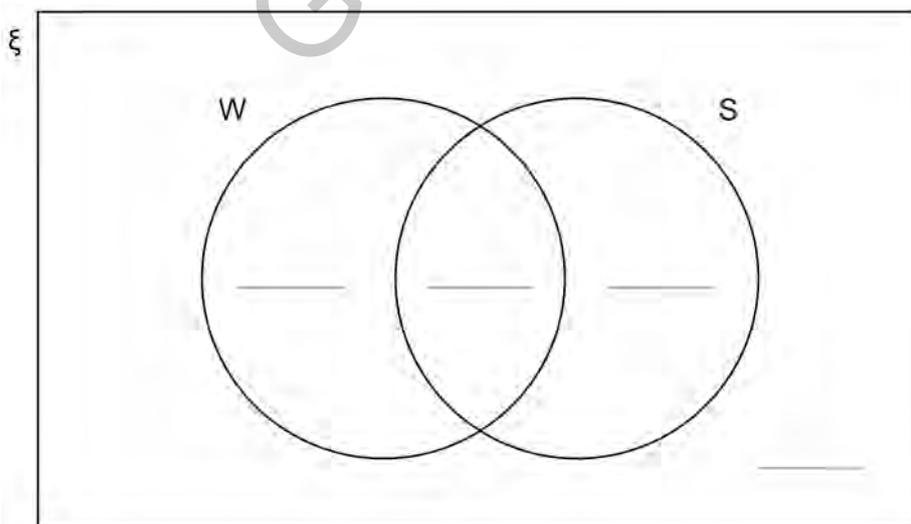
A walking group has 210 members.
One week, the group organised a walk on Wednesday and a walk on Saturday.
The frequency tree shows how many members went on the walks.



Show the information on the Venn diagram.

[4 marks]

- ξ = 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]

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

Turn over ►



22 The first two cube numbers are 1 and 8

Show that

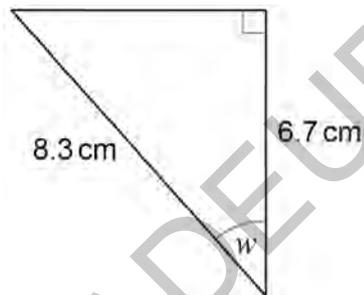
the 3rd cube number can be written as the sum of three different prime numbers.

[3 marks]

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

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

[3 marks]

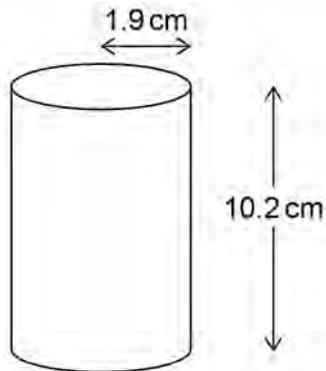


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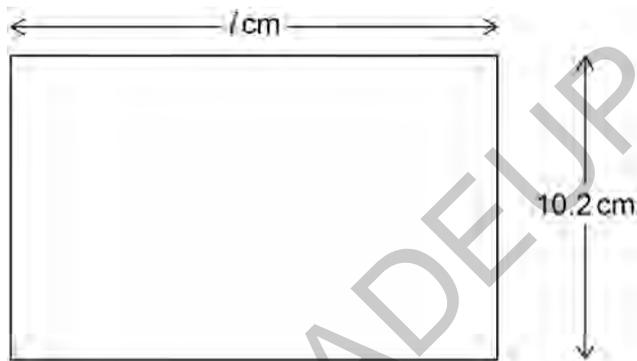
$$w = \underline{\hspace{2cm}}^\circ$$



- 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.

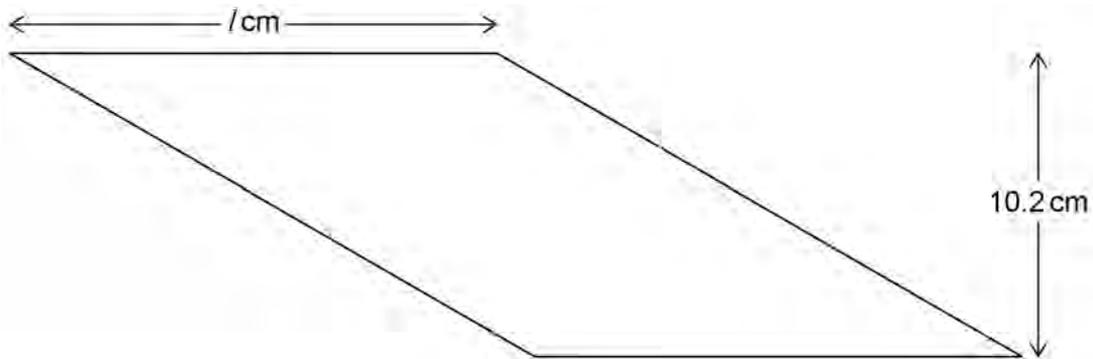
[3 marks]

Answer _____ 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

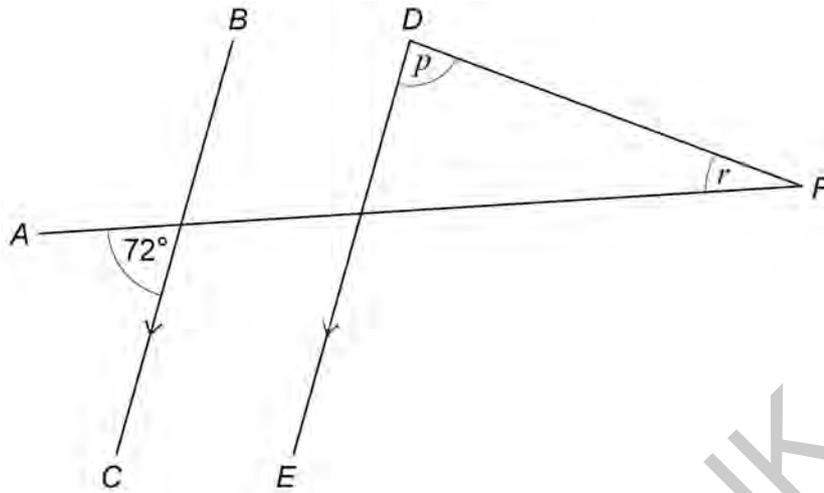
It is more than the perimeter of the rectangle



27

AF , BC , DE and DF are straight lines.

BC and DE are parallel.



Not drawn
accurately

p is three times r .

Work out the size of angle p .

[3 marks]

$$p = \underline{\hspace{2cm}}^{\circ}$$

END OF QUESTIONS



There are no questions printed on this page

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outside the
box*

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ANSWER IN THE SPACES PROVIDED**

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