



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

Wednesday 14 June 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              |      |
| 24–25              |      |
| <b>TOTAL</b>       |      |

### Advice

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



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

Do not write  
outside the  
box

1 (a) Solve  $5x = 15$

[1 mark]

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

1 (b) Solve  $y + 7 = 50$

[1 mark]

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

1 (c) Solve  $\frac{c}{4} = 8$

[1 mark]

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$c =$  \_\_\_\_\_



2 Here is a list of numbers.

10 8 2 11 12 15 4 4

2 (a) Write down the mode.

[1 mark]

Answer \_\_\_\_\_

2 (b) Work out the median.

[2 marks]

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Answer \_\_\_\_\_

2 (c) Work out the range.

[1 mark]

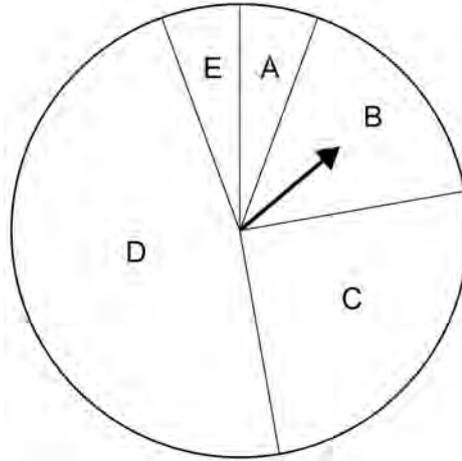
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Answer \_\_\_\_\_

Turn over for the next question



- 3 (a) A fair spinner with five sections is spun.



Complete these statements.

[2 marks]

The spinner is **most likely** to land on section \_\_\_\_\_

The spinner is **equally likely** to land on sections \_\_\_\_\_ and \_\_\_\_\_



**3 (b)** Two different spinners are spun.

One spinner has sections labelled with colours.

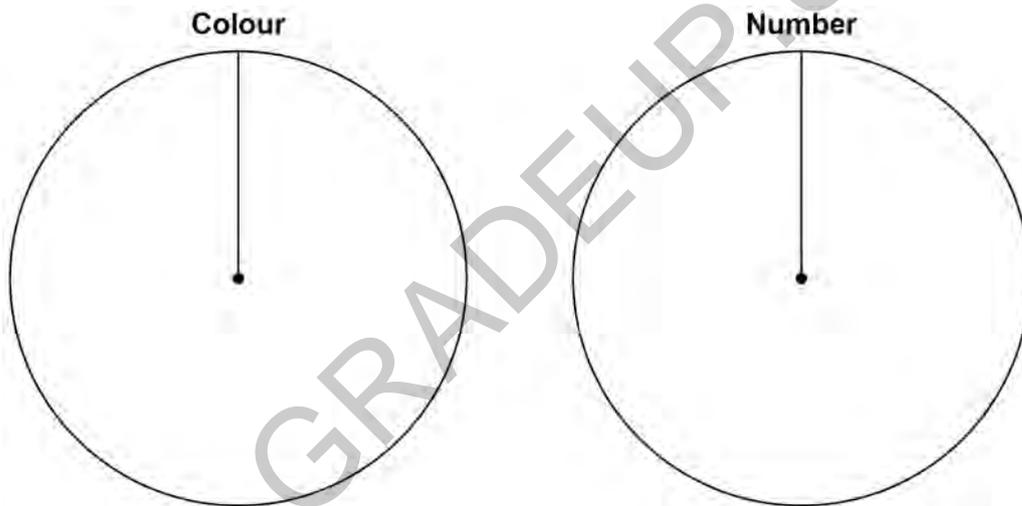
The other spinner has sections labelled with numbers.

Here is a list of **all** the possible outcomes.

|         |         |         |         |
|---------|---------|---------|---------|
| Red 1   | Red 2   | Red 3   | Red 4   |
| Blue 1  | Blue 2  | Blue 3  | Blue 4  |
| Green 1 | Green 2 | Green 3 | Green 4 |

Show the possible sections on the two spinners.

**[2 marks]**



**Turn over for the next question**



- 4 A reel holds 9.5 metres of ribbon.  
2 pieces of ribbon are cut from the reel.  
Each piece is 20 centimetres long.  
What length of ribbon is left on the reel?  
State the units of your answer.

**[3 marks]**

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Answer \_\_\_\_\_

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- 5 (a) The term-to-term rule for a sequence is

subtract 1 then multiply by 5

The 1st term is 4

Work out the 3rd term.

[2 marks]

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Answer \_\_\_\_\_

- 5 (b) The term-to-term rule for a different sequence is

add 20 then divide by 2

The 2nd term is 50

Work out the 1st term.

[2 marks]

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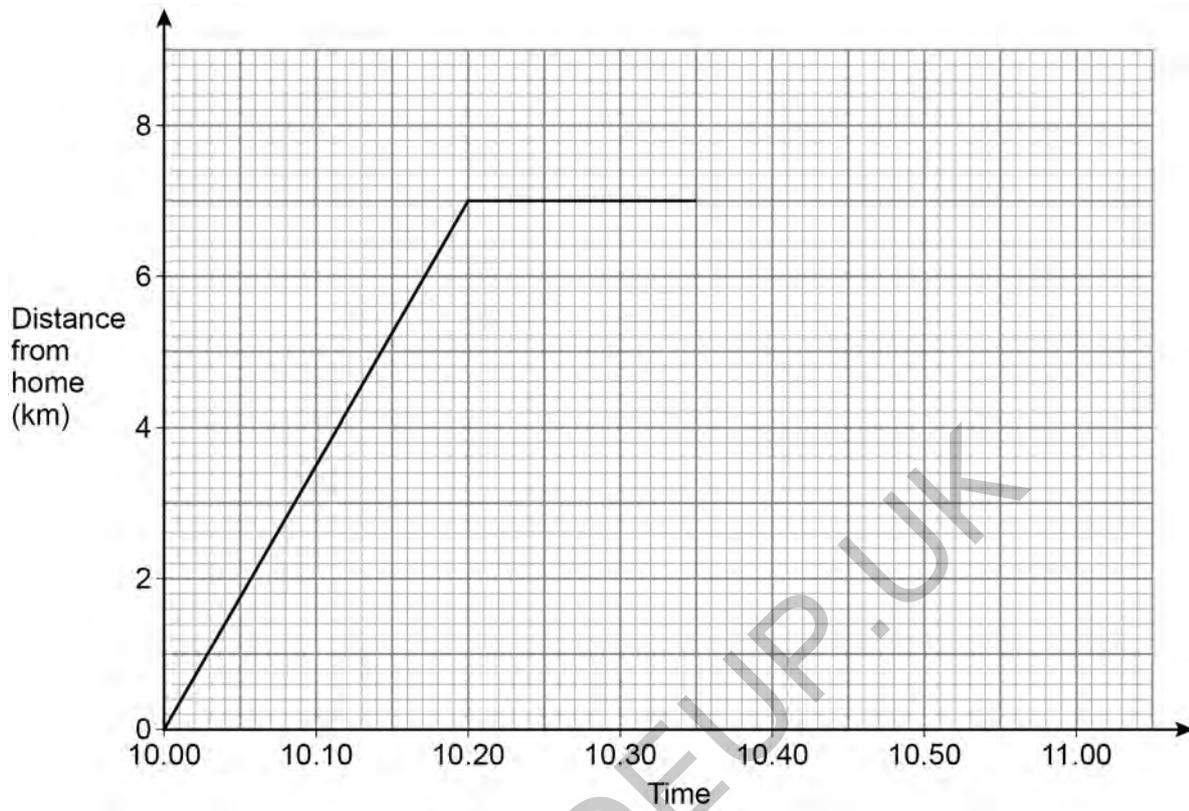
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Answer \_\_\_\_\_



- 6 Scarlett leaves home at 10.00 to cycle to the supermarket.  
Here is part of a distance-time graph of her trip to the supermarket.



- 6 (a) She arrives at the supermarket at 10.20  
How far is the supermarket from her home?

[1 mark]

Answer \_\_\_\_\_ km

- 6 (b) She leaves the supermarket at 10.35  
How long does she stay at the supermarket?

[1 mark]

Answer \_\_\_\_\_ minutes



- 6 (c)** Scarlett cycles home at a constant speed using the same route.  
It takes her 3 minutes longer than her journey to the supermarket.  
Complete the distance-time graph.

**[2 marks]**


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- 7** This week, Liam works  
25 hours at £10.20 per hour  
and  
extra hours at the weekend at £11.80 per hour.

Here are the extra hours he works at the weekend.

|                 |               |
|-----------------|---------------|
| <b>Saturday</b> | 7 am to 10 am |
| <b>Sunday</b>   | 1 pm to 3 pm  |

In **total**, how much is he paid this week?

**[4 marks]**


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Answer £ \_\_\_\_\_



- 8 Three oranges have masses of 60 g, 70 g and 85 g

Show that their **total** mass is between  $\frac{1}{5}$  and  $\frac{1}{4}$  of a kilogram.

[3 marks]

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- 9 For each statement, tick the correct box.

[3 marks]

|   | Always true              | Sometimes true           | Never true               |
|---|--------------------------|--------------------------|--------------------------|
| One of the three angles of a triangle is $90^\circ$ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| One of the three angles of a triangle is obtuse     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| One of the three angles of a triangle is reflex     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



10 (a) Simplify fully  $p^2 \times p$

[1 mark]

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Answer \_\_\_\_\_

10 (b) Simplify fully  $3a + 5c - a + 6c$

[2 marks]

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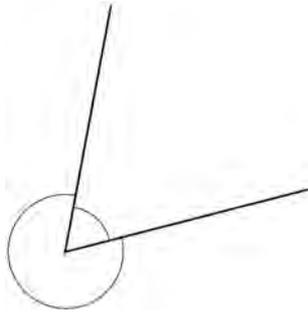
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Answer \_\_\_\_\_

Turn over for the next question



- 11 Two angles around a point are shown.



Not drawn  
accurately

The angles are in the ratio  $2 : 7$

Show that the larger angle is  $280^\circ$

[2 marks]

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**12 (a)**  $c > 4$      $d < 4$      $c - d = 6$

Work out a possible pair of values for  $c$  and  $d$ .

[2 marks]

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$c =$  \_\_\_\_\_  $d =$  \_\_\_\_\_

**12 (b)**  $w$  is greater than 1 **and** less than 2  
 $x$  is greater than 0 **and** less than 1

$w + x = 2.6$

Work out a possible pair of values for  $w$  and  $x$ .

[2 marks]

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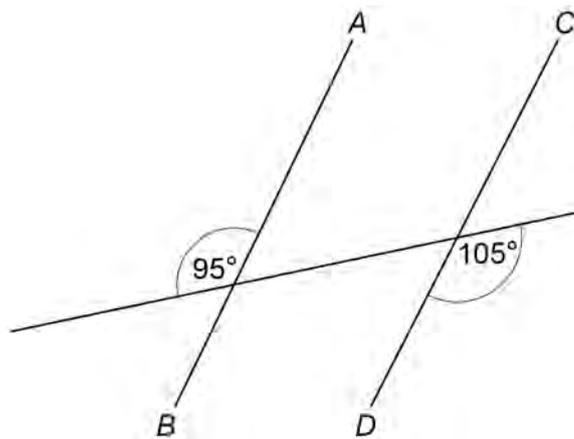


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$w =$  \_\_\_\_\_  $x =$  \_\_\_\_\_



13 Here are three straight lines.



Not drawn  
accurately

Are the lines  $AB$  and  $CD$  parallel?

Tick a box.

Yes

No

Show working to support your answer.

[2 marks]

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- 14 Match the algebra to the correct description.  
One has been done for you.

[3 marks]

$$5a = 20$$

$$4b > 20$$

$$2e + e = 3e$$

$$5d + 7e$$

Identity

Formula

Equation

Inequality

Expression

Turn over for the next question

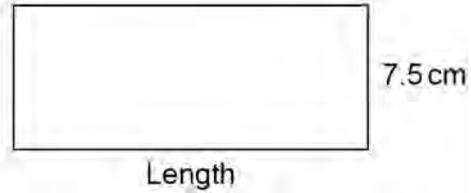
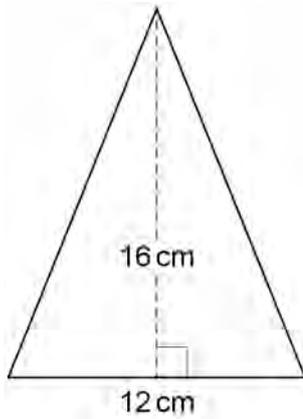
Turn over ►





- 16 The rectangle and the triangle have the same area.

Not drawn  
accurately



Work out the length of the rectangle.

[3 marks]

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Answer \_\_\_\_\_ cm

Turn over for the next question

Turn over ►



- 17 Match the name to the correct sequence.  
One has been done for you.

[2 marks]

| Name                    | Sequence             |
|-------------------------|----------------------|
| Quadratic sequence      | 4, 5, 9, 14, 23...   |
| Linear sequence         | -3, 1, 5, 9, 13...   |
| Fibonacci-type sequence | -4, -1, 1, 5, 12...  |
|                         | 8, 11, 16, 23, 32... |

- 18 The number of hedgehogs in England is expected to **reduce** by 4% each year.  
Assume there are now 1 000 000 hedgehogs in England.  
Work out the expected number of hedgehogs in England after **five** years.  
You **must** show your working.

[3 marks]

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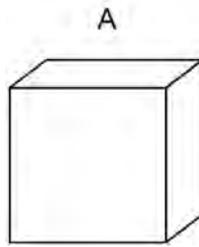


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Answer \_\_\_\_\_



19 Here is cuboid A.



Cuboid B is made from **two** of cuboid A.



volume of A : volume of B = 1 : 2

Matthew says,

“surface area of A : surface area of B must be 1 : 2 because B is made of 2 of A.”

Is Matthew correct?

Tick **one** box.

Yes

No

Cannot tell

Give a reason for your answer.

[2 marks]

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7

Turn over ►



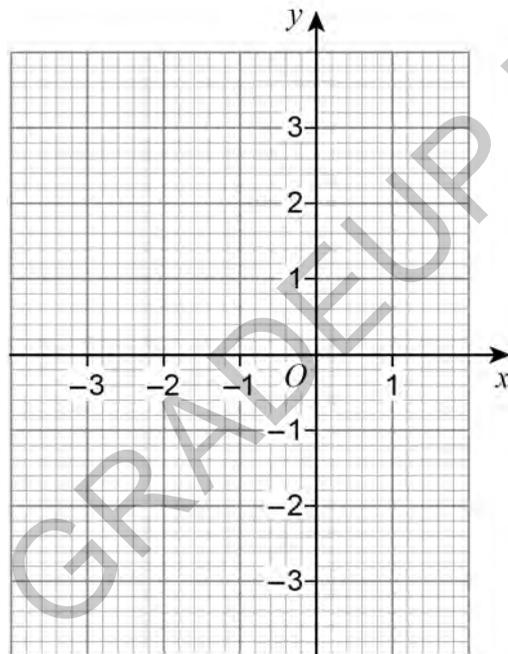
20 (a) Complete the table of values for  $y = x^2 + 2x$

[2 marks]

|     |    |    |    |   |   |
|-----|----|----|----|---|---|
| $x$ | -3 | -2 | -1 | 0 | 1 |
| $y$ | 3  |    | -1 | 0 |   |

20 (b) Draw the graph of  $y = x^2 + 2x$  for values of  $x$  from -3 to 1

[2 marks]



21

Jing has £2450

She saves some and gives the rest to her four brothers.

money saved : money given to brothers = 2 : 5

She gives each of her **four** brothers the **same** amount.

Does each brother receive more than £430 ?

You **must** show your working.

**[4 marks]**

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**Turn over for the next question**

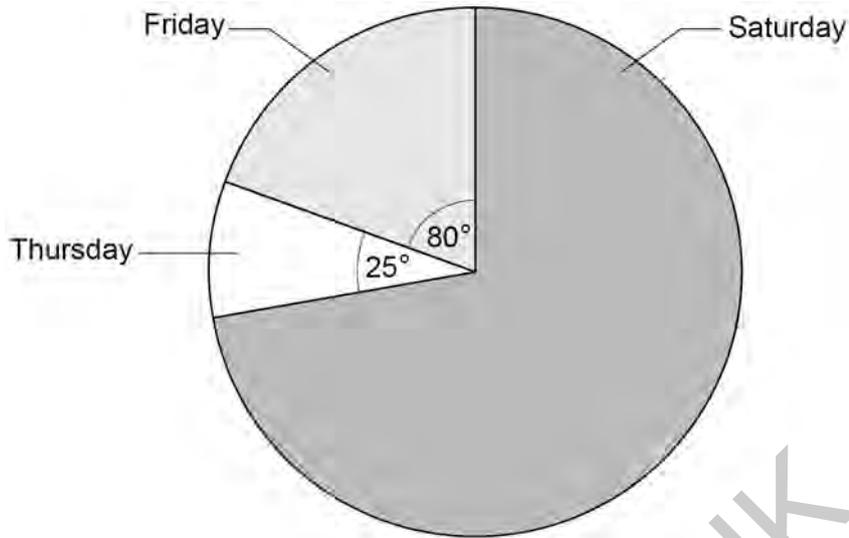
8

**Turn over ►**

22

The pie chart shows information about people at a fair during three days.

Not drawn  
accurately



There were 132 **more** people on Friday than on Thursday.

Work out the number of people on Saturday.

[3 marks]

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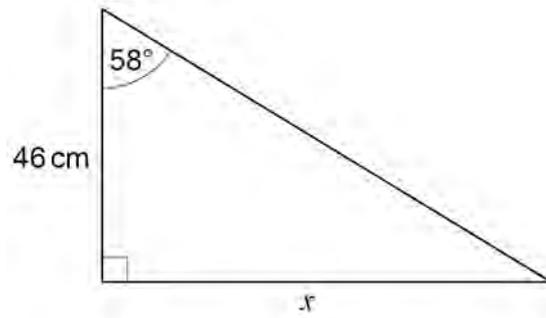


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Answer \_\_\_\_\_



23

Use trigonometry to work out the value of  $x$ .Not drawn  
accurately

[3 marks]

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 $x =$  \_\_\_\_\_ cm

Turn over for the next question

Turn over ►



24 Millie is estimating the value of  $\frac{1}{(\sqrt[3]{8.34})^2} \times 10.21$

She rounds each decimal number to 1 significant figure.

24 (a) Work out Millie's estimate.  
You **must** show your working.

[2 marks]

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Answer \_\_\_\_\_

24 (b) Millie says,  
"My estimate must be more than the exact value."

**Without working out the exact value**, give a reason how she can know this.

[1 mark]

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25 (a) Factorise  $x^2 + 8x + 15$

[2 marks]

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Answer \_\_\_\_\_

25 (b) Write down the **two** solutions of  $(y + 2)(y - 4) = 0$

[1 mark]

Answer \_\_\_\_\_

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END OF QUESTIONS



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outside the  
box*

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ANSWER IN THE SPACES PROVIDED**

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