AQA

GCSE
MATHEMATICS

F

Foundation Tier   Paper 3 Calculator
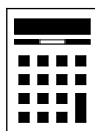
Wednesday 14 June 2023   Morning   Time allowed: 1 hour 30 minutes

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.

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	
24–25	
TOTAL	

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

1 (a) Solve $5x = 15$

[1 mark]

$x =$ _____

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

[1 mark]

$y =$ _____

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

[1 mark]

$c =$ _____

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]

_____
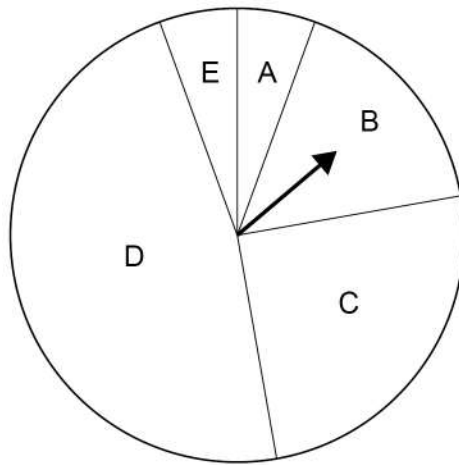
_____

_____

Answer _____

2 (c) Work out the range.

[1 mark]

_____

Answer _____

Turn over for the next question

7

Turn over ▶

0 3

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.

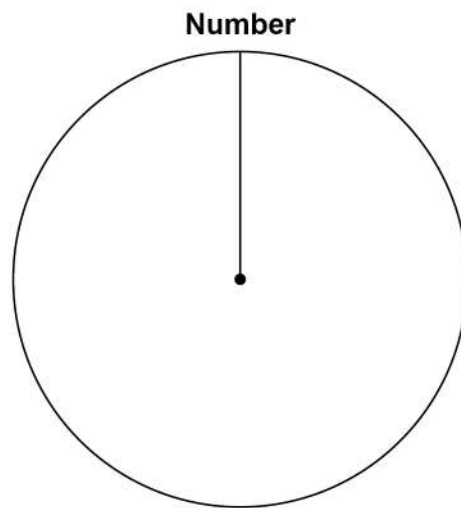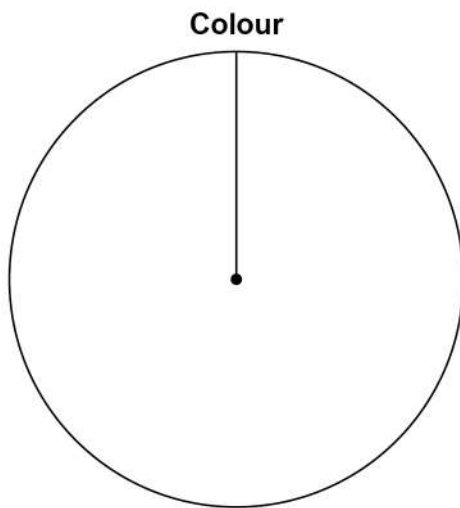One spinner has sections labelled with colours.

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]

Colour

Number

Turn over for the next question

4

Turn over ▶

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]

Answer _____

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]

Answer _____

5 (b) The term-to-term rule for a different sequence is
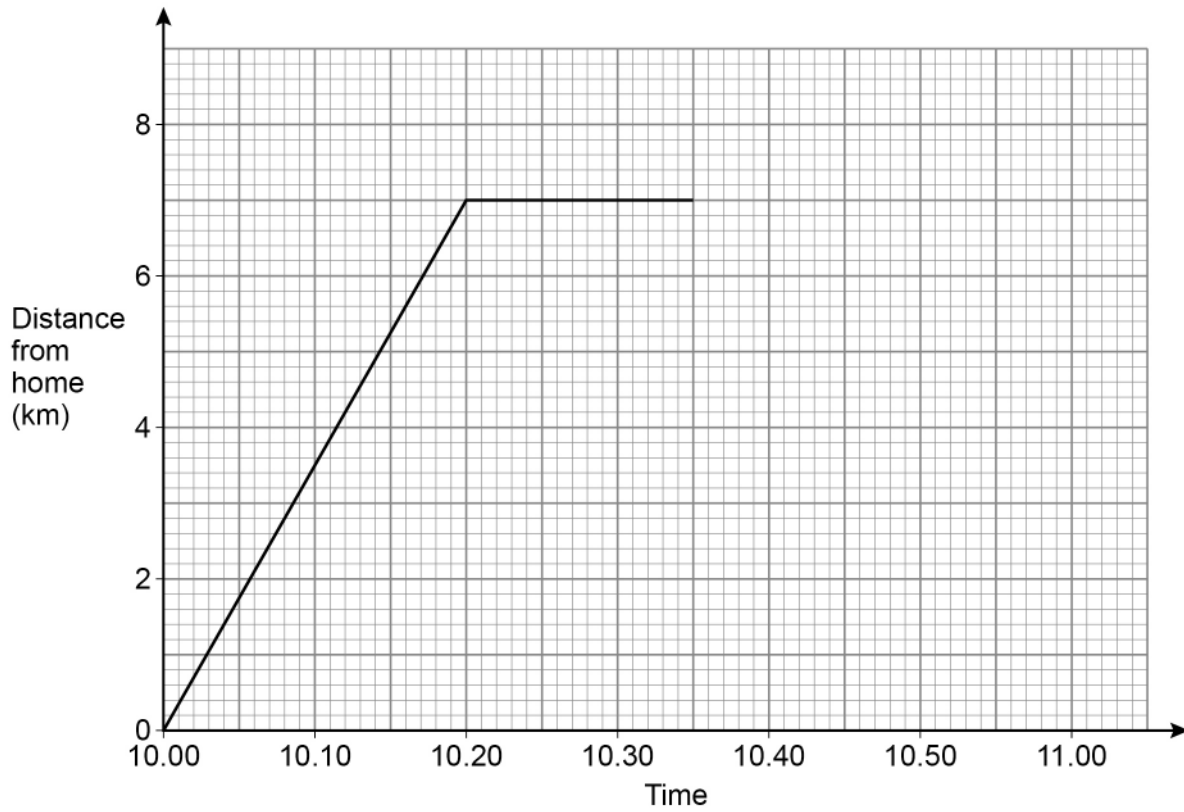
| add 20 then divide by 2 |

The 2nd term is 50

Work out the 1st term.

[2 marks]

Answer _____

Turn over ►

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]

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.

Saturday	7 am to 10 am
Sunday	1 pm to 3 pm

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

[4 marks]

Answer £ _____

8

Turn over ▶

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]

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°	☐	☐	☐
One of the three angles of a triangle is obtuse	☐	☐	☐
One of the three angles of a triangle is reflex	☐	☐	☐

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

[1 mark]
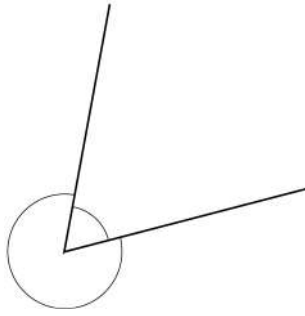
Answer _____

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

[2 marks]

Answer _____

Turn over for the next question

9

Turn over ▶

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°

[2 marks]

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

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

[2 marks]

$c =$ _____ $d =$ _____

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

x is greater than 0 **and** less than 1

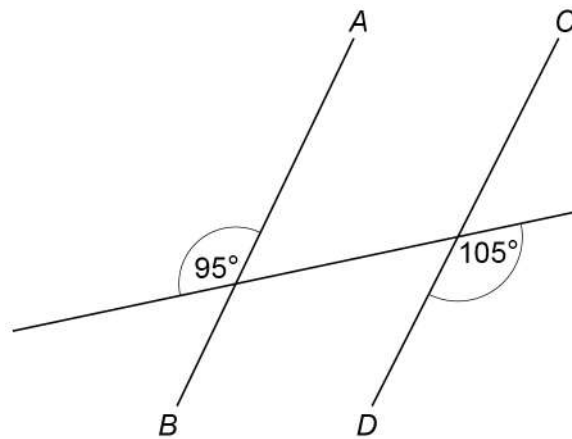$$w + x = 2.6$$

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

[2 marks]

$w =$ _____ $x =$ _____

Turn over ▶

6

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]

Do not write outside the box

14 Match the algebra to the correct description.

One has been done for you.

[3 marks]

$5a = 20$		Identity
$4b > 20$		Formula
$2c + c \equiv 3c$		Equation
$5d + 7e$		Inequality
		Expression

Turn over for the next question

5

Turn over ▶

15 Popcorn is sold in bags.

8 small bags have a total mass of 496 g

5 small bags and 2 large bags have a total mass of 638 g

Work out the mass of a large bag.

[4 marks]

Answer _____ g

16 The rectangle and the triangle have the same area.

Not drawn accurately

16 cm

12 cm

7.5 cm
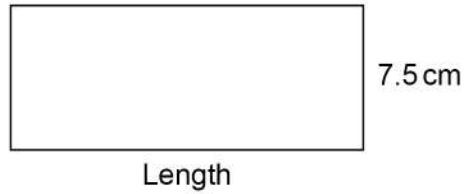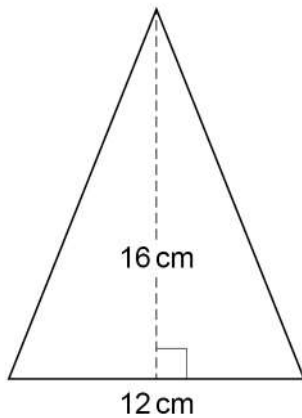
Length

Work out the length of the rectangle.

[3 marks]

Answer _____ cm

Turn over for the next question

7

Turn over ▶

17 Match the name to the correct sequence.

One has been done for you.

[2 marks]

Name   **Sequence**

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

(Quadratic sequence is connected to 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.
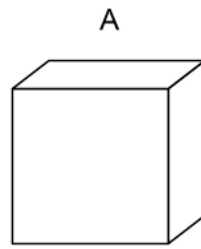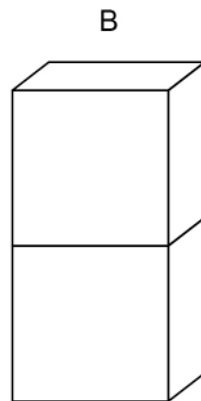
You **must** show your working.

[3 marks]

Answer _____

19 Here is cuboid A.

A

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

B

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
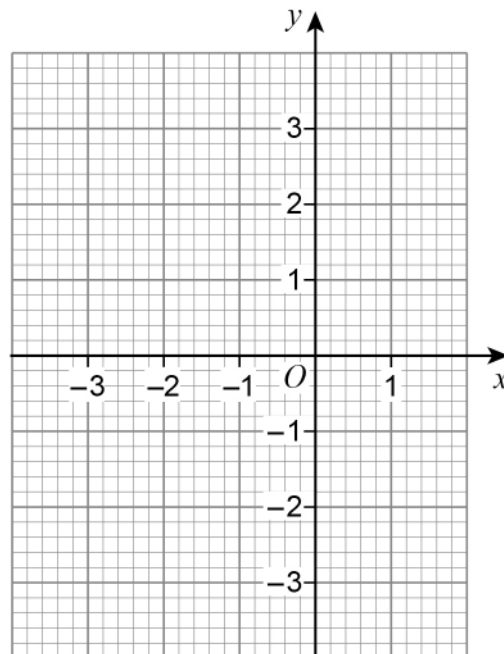
Give a reason for your answer.

[2 marks]

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.
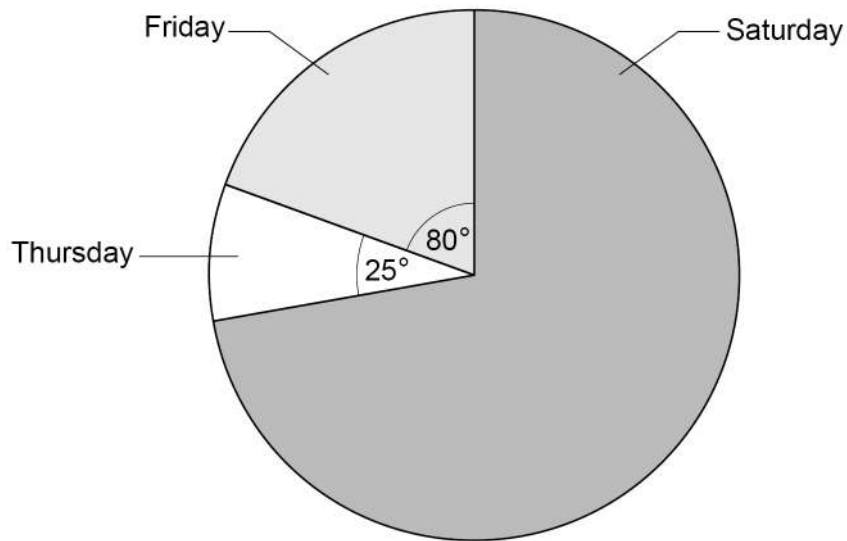
[4 marks]

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

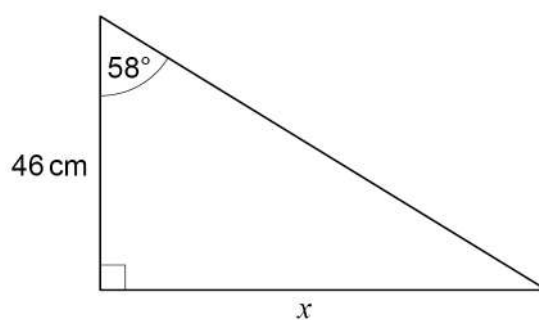There were 132 **more** people on Friday than on Thursday.

Work out the number of people on Saturday.

[3 marks]

Answer _____

23 Use trigonometry to work out the value of x.

Not drawn accurately

58°

46 cm

x

[3 marks]

$x =$ _____ cm

Turn over for the next question

6

Turn over ▶

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

She rounds each decimal number to 1 significant figure.

24 (a)   Work out Millie's estimate.

You **must** show your working.

[2 marks]

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]

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

[2 marks]

Answer _____

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

[1 mark]

Answer _____

END OF QUESTIONS

6