AQA

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
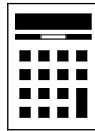
Wednesday 14 June 2023   Morning   Time allowed: 1 hour 30 minutes

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.

Advice

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

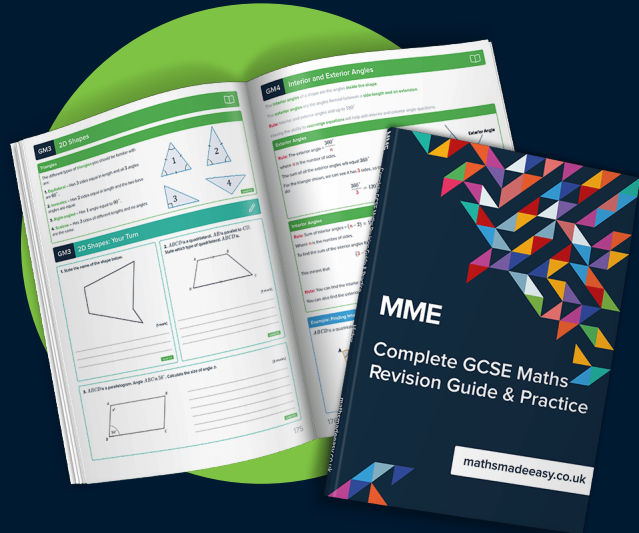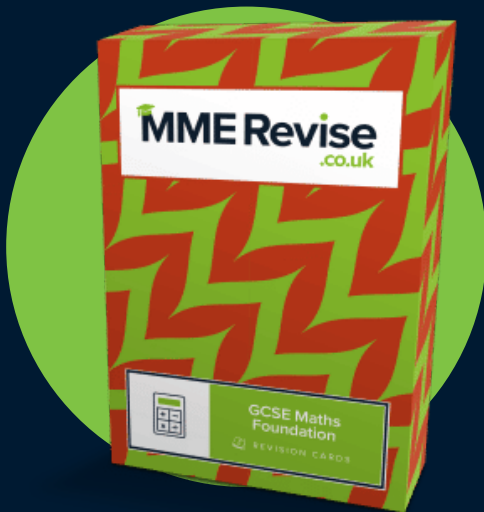| For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
TOTAL	

MME.

GCSE Revision - GCSE Maths
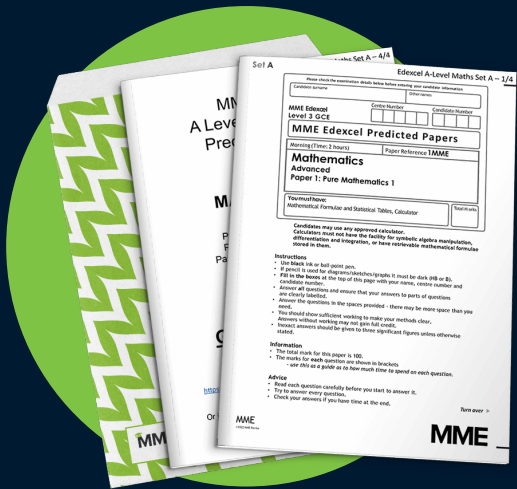
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Answer **all** questions in the spaces provided.

1 (a)   Solve $5x = 15$

$\div 5$ ($x = 3$) $\div 5$

[1 mark]

$x =$ 3

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

$y = 50 - 7$

$y = 43$

[1 mark]

$y =$ 43

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

$c = 8 \times 4$

$c = 32$

[1 mark]

$c =$ 32

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2 Here is a list of numbers.

10   8   2   11   12   15   4   4

2 (a) Write down the mode.

most common

[1 mark]

Answer _4_

2 (b) Work out the median.

[2 marks]

2   4   4   8   10   11   12   15

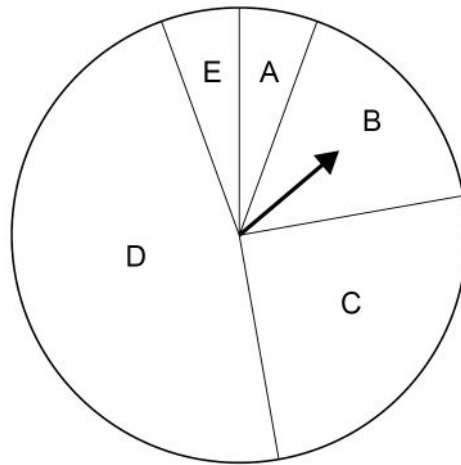*median = 9*

Answer _9_

2 (c) Work out the range.

[1 mark]

15 - 2 = 13

Answer _13_

Turn over for the next question

7

Turn over ▶

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

Complete these statements.

[2 marks]

The spinner is **most likely** to land on section _____ D _____

The spinner is **equally likely** to land on sections _____ E _____ and _____ A _____

3 (b) Two different spinners are spun.
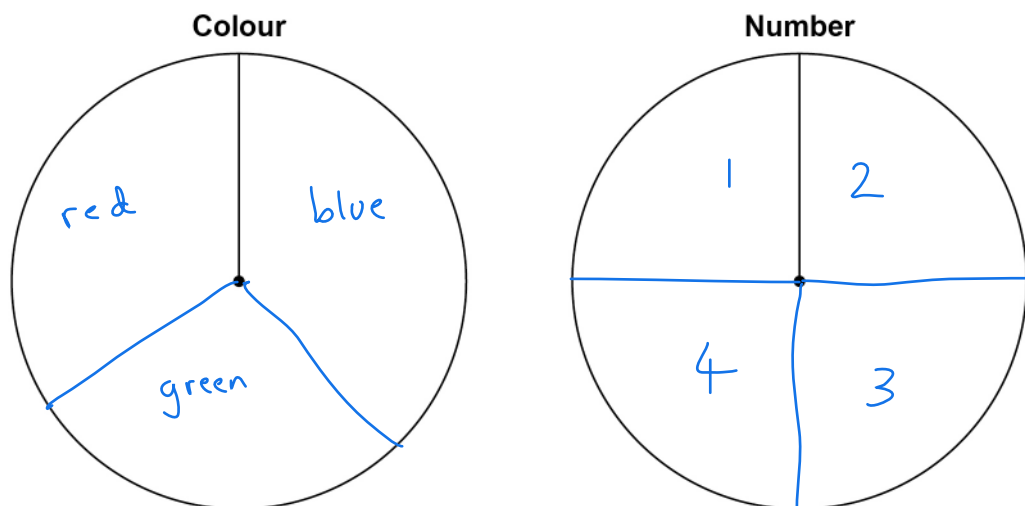
One spinner has sections labelled with colours.

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

red   blue

green

1   2

4   3

Turn over for the next question

4

Turn over ▶

4   A reel holds 9.5 metres of ribbon. $9.5 \times 100 = 950$ cm

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]

$950 - (2 \times 20)$

$= 950 - 40$

$= 910$ cm

Answer   910 cm

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]

-1 then x5   -1 then x5

4   15   70

Answer   70

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]

+ 20 then ÷ 2

?   50

x 2 then - 20
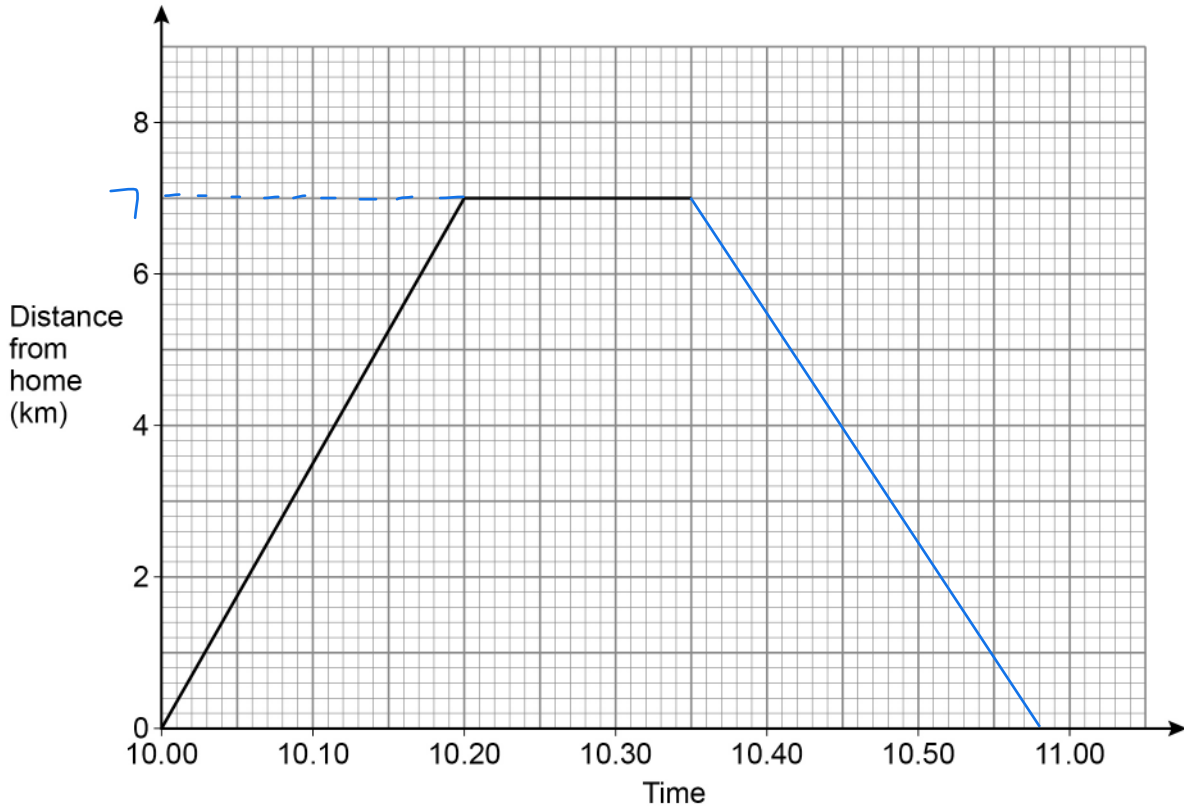
50 x 2 = 100

100 — 20 = 80

Answer   80

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 _____ 7 _____ km

6 (b) She leaves the supermarket at 10.35

How long does she stay at the supermarket?

[1 mark]

10.20 am — 10.35am

Answer _____ 15 _____ minutes

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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]

20 mins to get to supermarket so 23 mins home

10:35 + 23 mins so will arrive home 10:58

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 | 3 hours |
| Sunday | 1 pm to 3 pm | 2 hours |

5 hours extra

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

[4 marks]

normal hours: 25 × £10.20 = £255

extra hours: 5 × £11.80 = £59

total = £255 + £59

= £314

Answer £ 314

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]

Total mass = 60 + 70 + 85 = 215g

$\frac{1}{5}$ of a kg is 1000 ÷ 5 = 200g

$\frac{1}{4}$ of a kg is 1000 ÷ 4 = 250g

215g is between 200g and 250g

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]

$p \times p \times p = p^3$

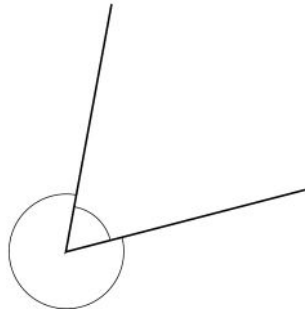Answer p^3

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

[2 marks]

Answer $2a + 11c$

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]

Angles add to 360° so divide 360 in ratio 2:7

2+7 = 9 parts   so   9 parts = 360°

÷9   1 part = 40°   ÷9

×7   7 parts = 280°   ×7

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

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

[2 marks]

$c =$ _20_ $d =$ _14_

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

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

$$w + x = 2.6$$

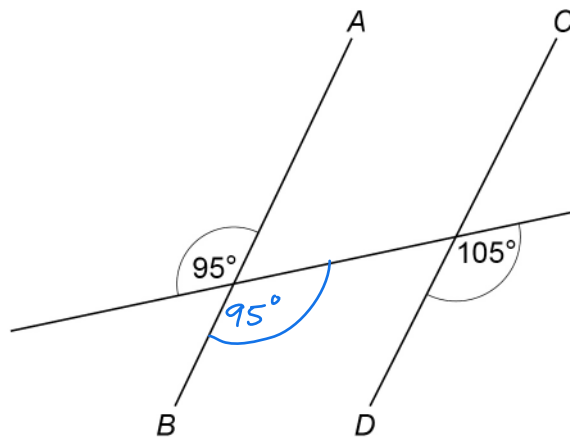Work out a possible pair of values for w and x.

[2 marks]

1.9 + 0.7 = 2.6

$w =$ _1.9_ $x =$ _0.7_

Turn over ▶

6

13   Here are three straight lines.

Not drawn accurately

(diagram showing three straight lines A–B and C–D crossed by a transversal, with angles labelled 95°, 95° and 105°)

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

Tick a box.

Yes ☐   No ☑

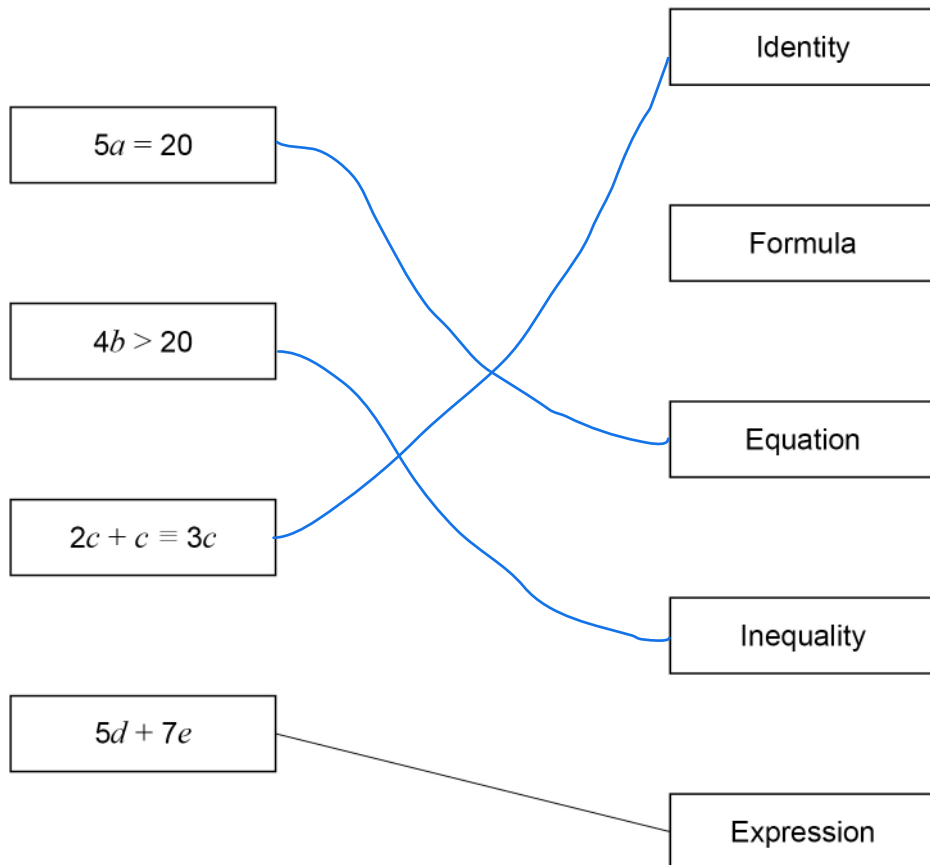Show working to support your answer.

[2 marks]

If the lines were parallel, the three labelled angles would be the same

14 Match the algebra to the correct description.

One has been done for you.

[3 marks]

$5a = 20$

$4b > 20$

$2c + c \equiv 3c$

$5d + 7e$

Identity

Formula

Equation

Inequality

Expression

Turn over for the next question

Turn over ▶

5

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]

Each small bag is $496 \div 8 = 62g$

5 small bags have mass $5 \times 62 = 310g$
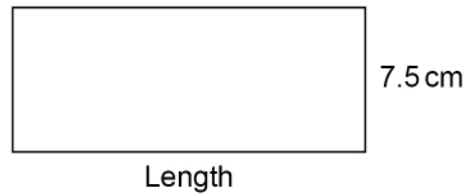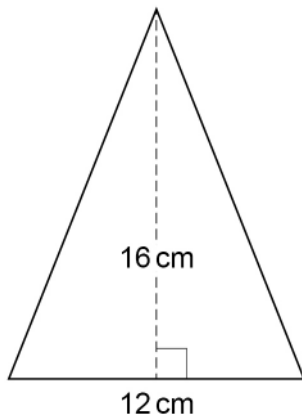
$638 - 310 = 328$ so 2 large bags have mass 328g

Each large bag must be $328 \div 2 = 164g$

Answer   164 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]

Area of triangle = $\frac{12 \times 16}{2}$ = 96 cm²

So area of rectangle is also 96 cm²

missing length is 96 ÷ 7.5 = 12.8 cm

Answer _____ 12·8 _____ 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

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...

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.

$100\% - 4\% = 96\%$

$= 0.96$

Work out the expected number of hedgehogs in England after **five** years.
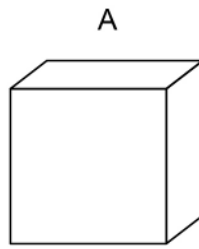
You **must** show your working.

[3 marks]

$1\,000\,000 \times 0.96^5 = 815,372 \cdot 6976$
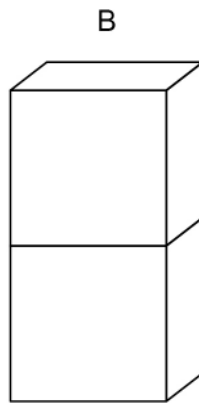
Answer $815,373$ to nearest hedgehog

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]

A has 6 faces

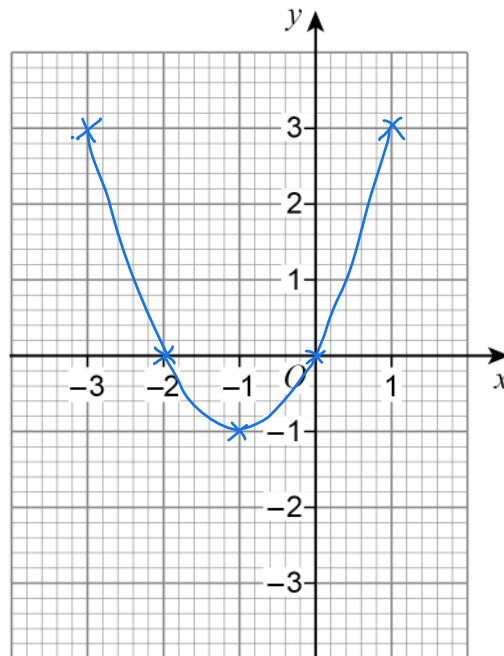B has 10 faces

Surface area of B is not double A

7

Turn over ▶

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

[2 marks]

x	-3	-2	-1	0	1
y	3	0	-1	0	3

20 (b) Draw the graph of $\quad y = x^2 + 2x \quad$ 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]

Divide £2450 in ratio 2:5

2+5=7 parts   so   7 parts = £2450

÷7   1 part = £350   ÷7

×5   5 parts = £1750   ×5   brothers get £1750 total

Each brother gets £1750 ÷ 4 = £437.50
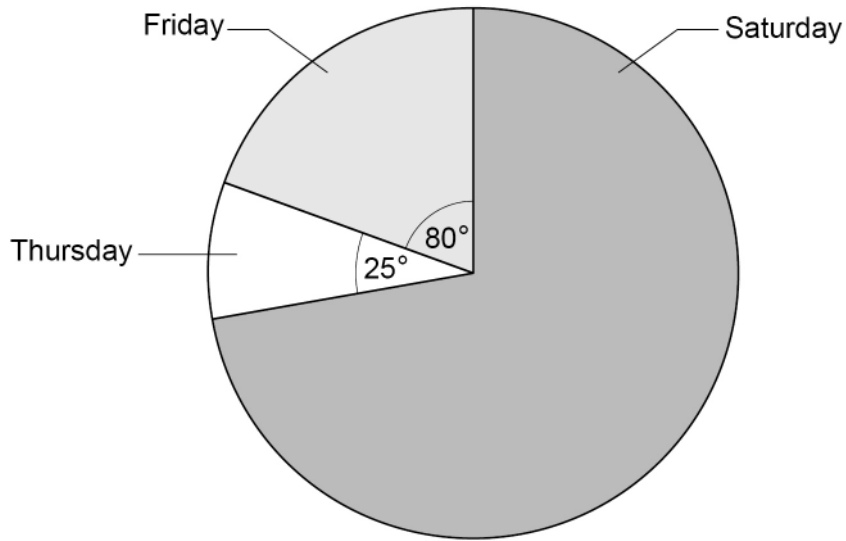
Yes, more than £430

Turn over for the next question

8

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]

Difference in angle between Thursday and Friday is $80 - 25 = 55°$

So $55° = 132$ people
÷55 ⟍ $1° = 2·4$ people ↙ ÷55

Angle for Saturday is $360 - 80 - 25 = 255°$

So number of people for Saturday is $255 × 2·4 = 612$

Answer _____612_____

Do not write outside the box

23   Use trigonometry to work out the value of x.

Not drawn accurately

58°

46 cm

x
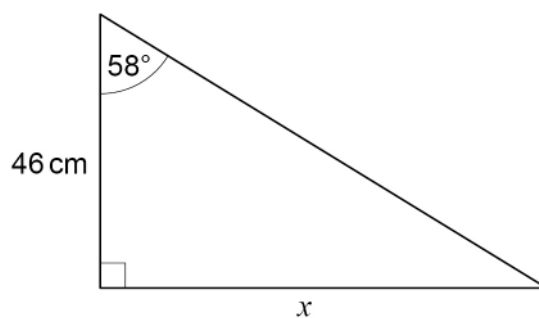
[3 marks]

$\tan 58 = \dfrac{x}{46}$

$\tan 58 \times 46 = x$

$73.62 = x$

$x = \underline{\quad 73.62 \quad}$ cm

Turn over for the next question

6

Turn over ▶

Do not write
outside the
box

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]

$$\dfrac{1}{\left(\sqrt[3]{8}\right)^2 \times 10} = \dfrac{1}{2^2 \times 10}$$

$$= \dfrac{1}{4 \times 10}$$

$$= \dfrac{1}{40}$$

Answer $\dfrac{1}{40}$

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]

Both numbers have been rounded down

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

[2 marks]

Answer $(x + 3)(x + 5)$

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

[1 mark]

Answer $y = -2$, $y = 4$

$y + 2 = 0$ or $y - 4 = 0$

$y = -2$ $y = 4$

END OF QUESTIONS

6