



Surname _____

Forename(s) _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

GCSE

MATHEMATICS

F

Foundation Tier Paper 3 Calculator

8300/3F

Wednesday 14 June 2023 Morning

Time allowed: 1 hour 30 minutes

At the top of the page, write your surname and forename(s), your centre number, your candidate number and add your signature.

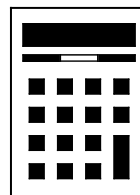
[Turn over]



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.
- Answer ALL questions.
- You must answer the questions in the spaces provided. Do not write 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.

DO NOT TURN OVER UNTIL TOLD TO DO SO



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 $\frac{c}{4} = 8$ [1 mark]

$c =$

[Turn over]



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]

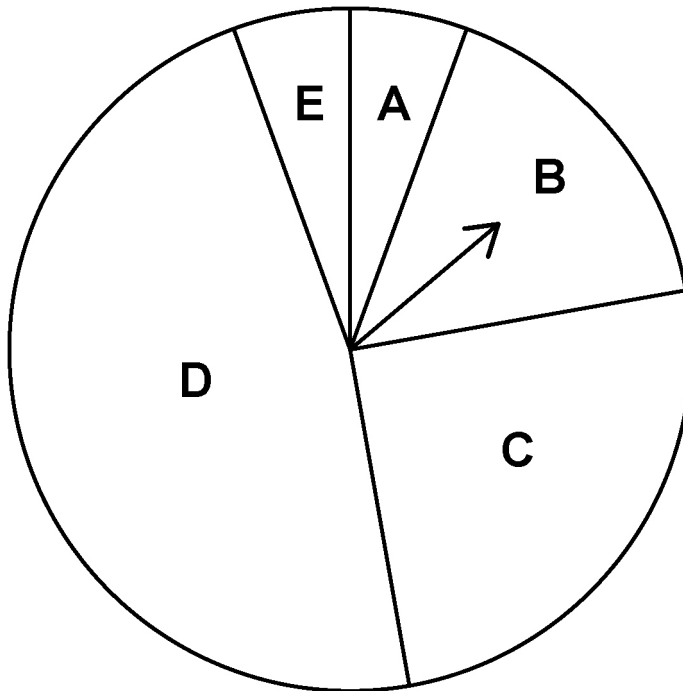
Answer _____

2 (c) Work out the range. [1 mark]

Answer _____



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 _____

[Turn over]



3 (b) Two different spinners are spun.

One spinner has sections labelled with colours.

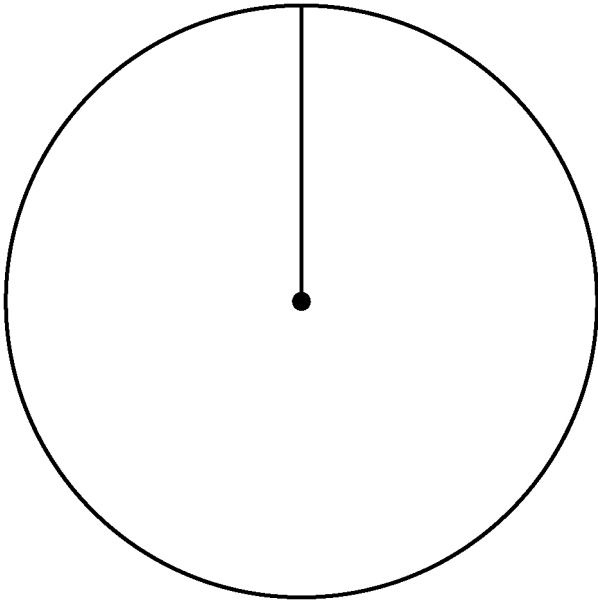
The other spinner has sections labelled with numbers.

Here is a list of ALL the possible outcomes.

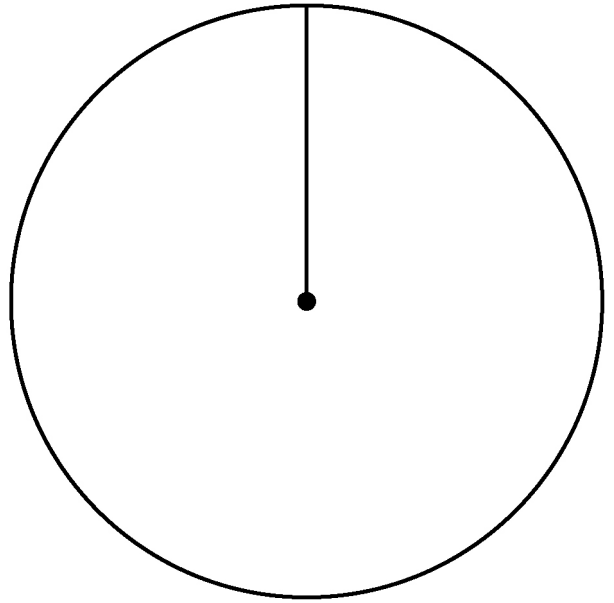
Red 1	Red 2	Red 3	Red 4
Blue 1	Blue 2	Blue 3	Blue 4
Green 1	Green 2	Green 3	Green 4

On the opposite page, show the possible sections on the two spinners. [2 marks]

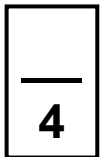
COLOUR



NUMBER



[Turn over]



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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 _____

[Turn over]



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 _____



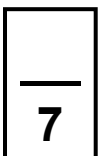
- 5 (b) The term-to-term rule for a different sequence is
add 20 then divide by 2

The 2nd term is 50

Work out the 1st term. [2 marks]

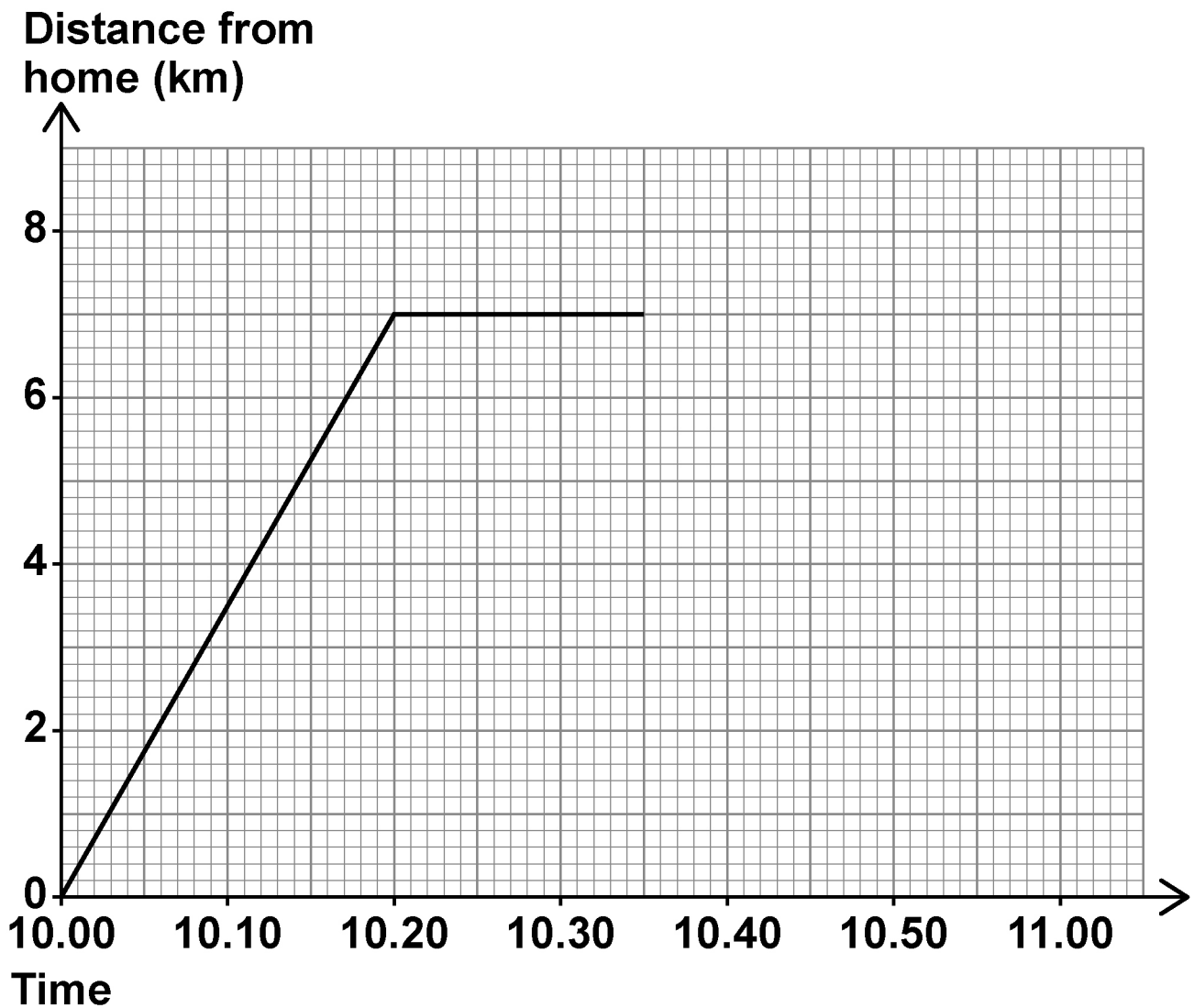
Answer

[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]

[Turn over]



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 £ _____

[Turn over]

—
8





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°	<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"/>

[Turn over]

10 (a) Simplify fully $p^2 \times p$ [1 mark]

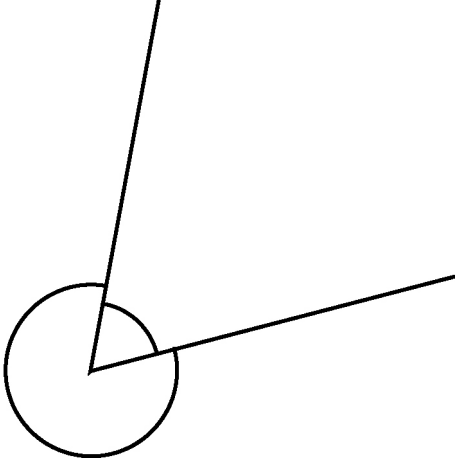
Answer

10 (b) Simplify fully $3a + 5c - a + 6c$ [2 marks]

Answer

11 Two angles around a point are shown.

The diagram is not drawn accurately.



The angles are in the ratio $2 : 7$

Show that the larger angle is 280° [2 marks]

[Turn over]



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]

$w =$ _____ $x =$ _____

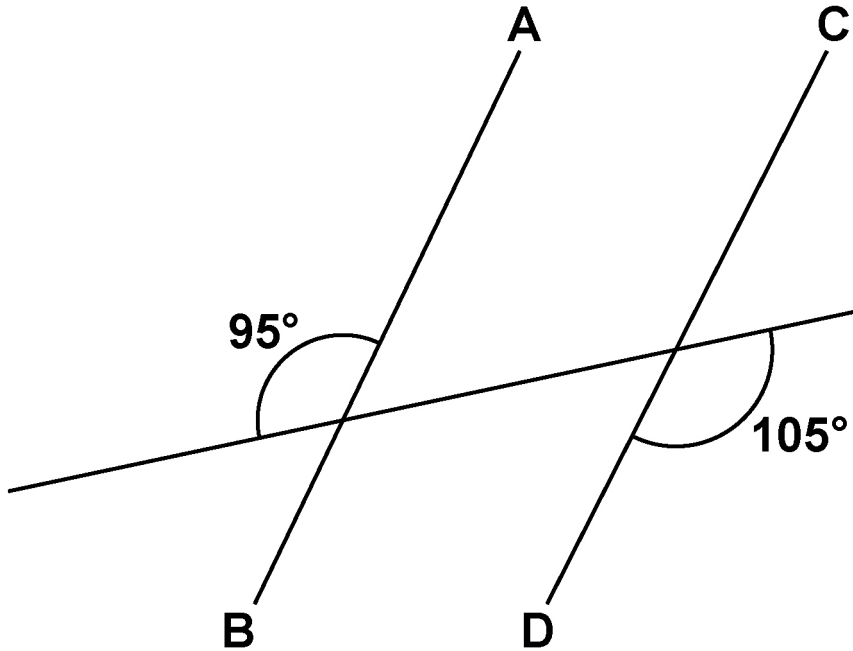
[Turn over]

6



13 Here are three straight lines.

The diagram is not drawn accurately.



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

Tick a box.

☐

Yes

☐

No

Show working to support your answer. [2 marks]

[Turn over]



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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]

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]

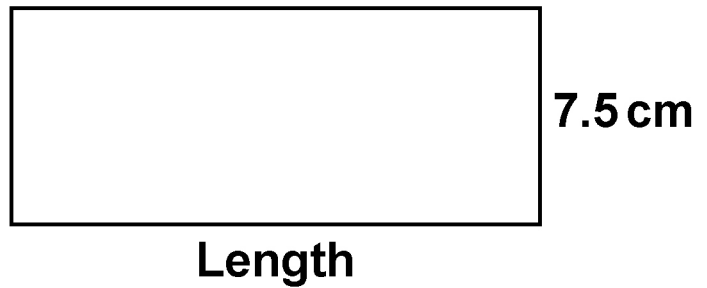
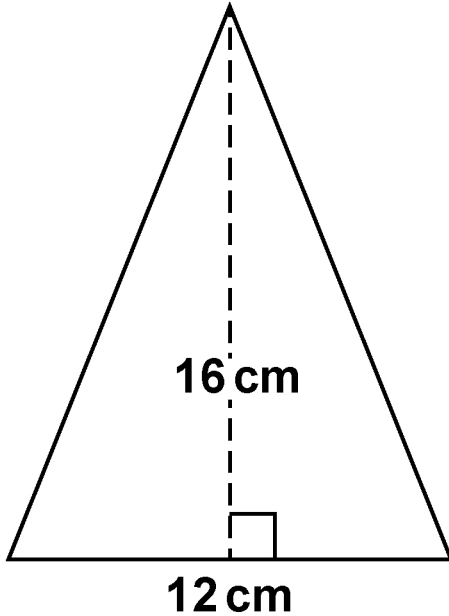
Answer _____ **g**

[Turn over]



16 The rectangle and the triangle have the same area.

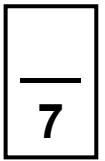
The diagrams are not drawn accurately.



Work out the length of the rectangle. [3 marks]

Answer _____ cm

[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]

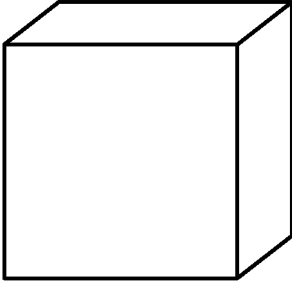
Answer _____

[Turn over]



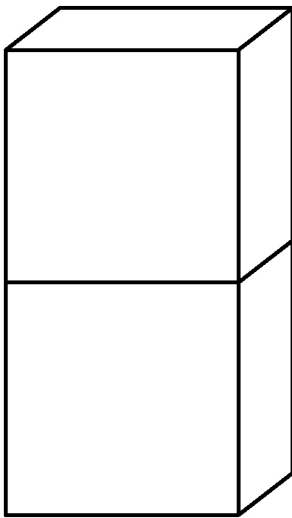
19 Here is cuboid A.

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]

[Turn over]

<hr/>
7



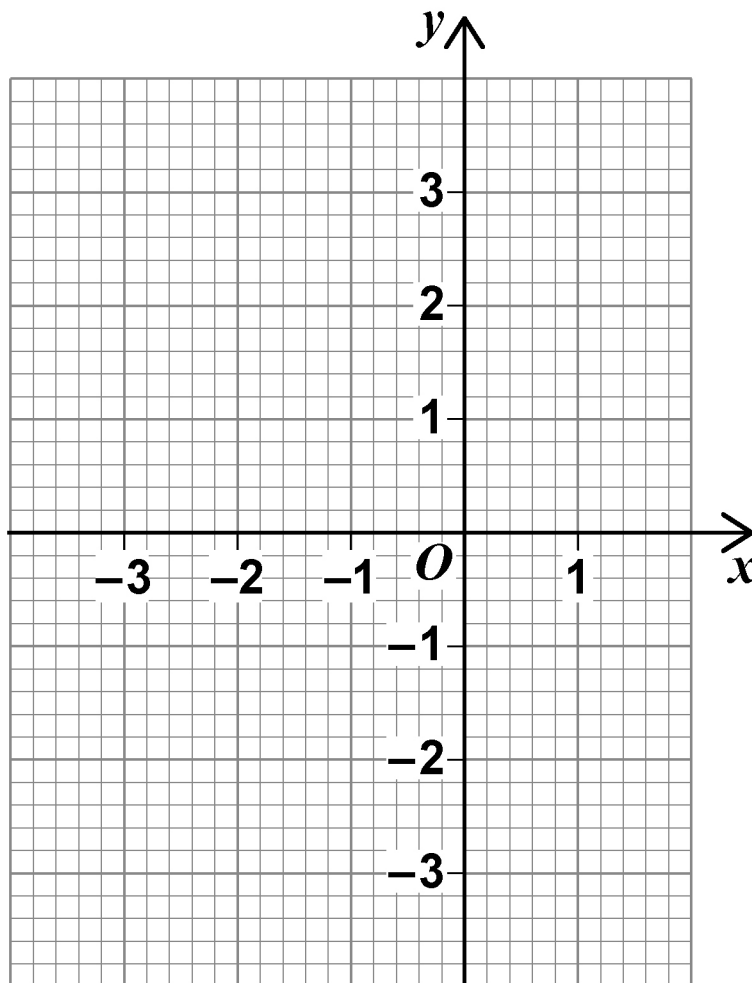
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- 20 (a) Complete the table of values for $y = x^2 + 2x$
[2 marks]

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]



[Turn over]



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]

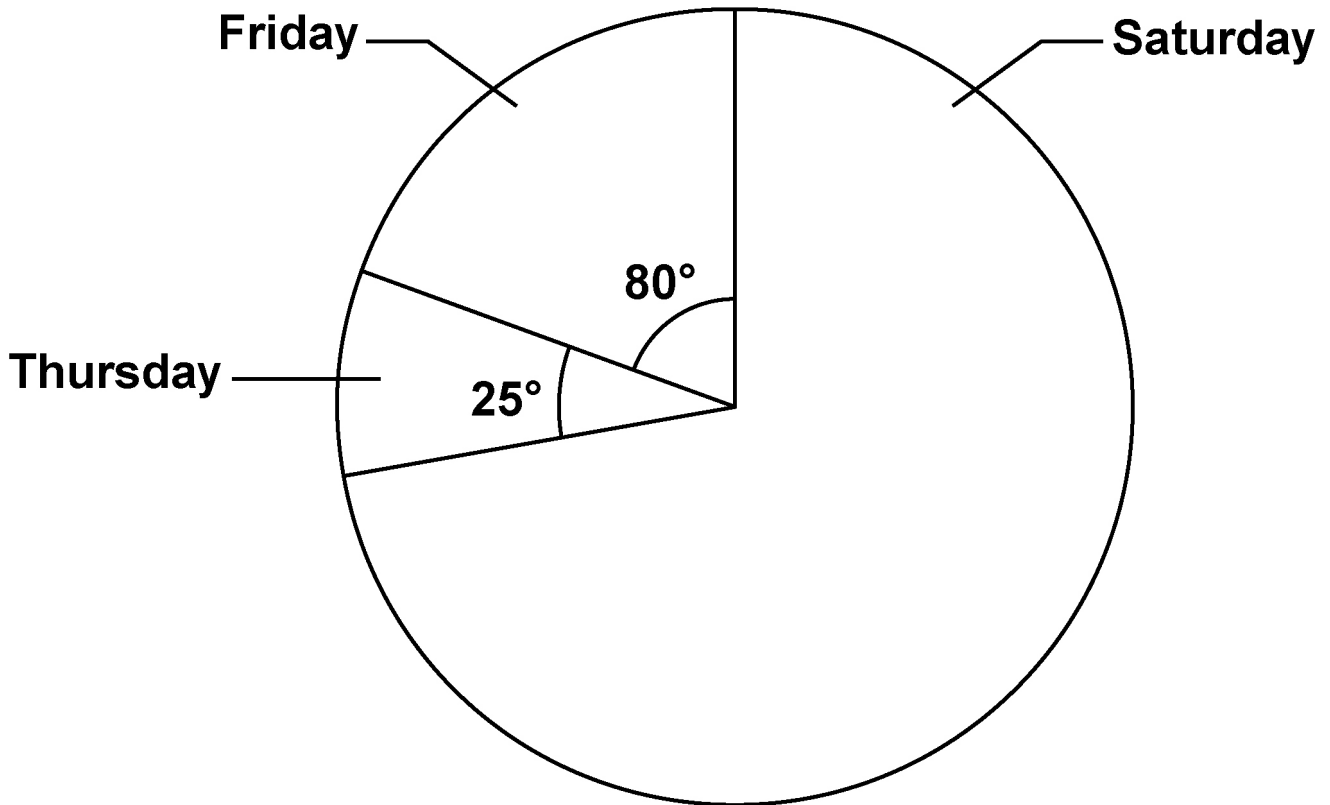
[Turn over]

<hr/>
8



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

The diagram is not drawn accurately.



There were 132 MORE people on Friday than on Thursday.

Work out the number of people on Saturday.
[3 marks]

Answer _____

[Turn over]

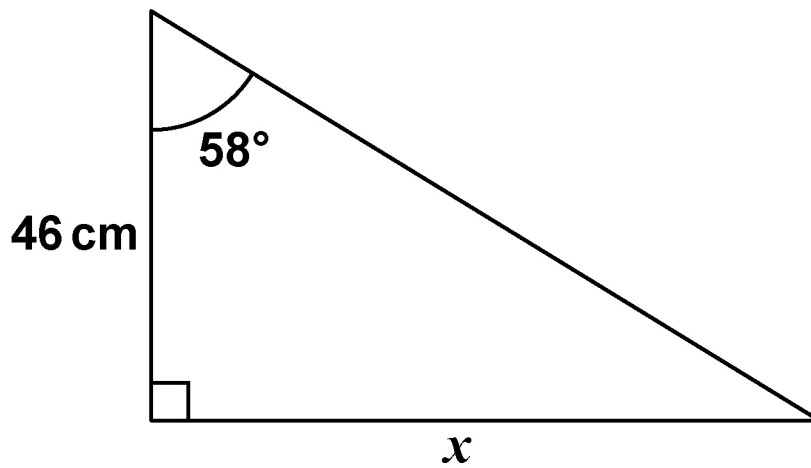


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23 Use trigonometry to work out the value of x .

The diagram is not drawn accurately. [3 marks]



$x =$ _____ cm

[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]

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]**

[Turn over]

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



Additional page, if required.

Write the question numbers in the left-hand margin.

[illegible]

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For Examiner's Use	
Pages	Mark
4–6	
7–9	
11–13	
14–17	
18–20	
21–23	
24–27	
28–31	
32–35	
37–39	
40–43	
44–46	
TOTAL	

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