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

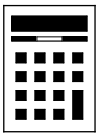
F

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	

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

Do not write outside the box

1 (a) Solve $5x = 15$

÷5 ÷5

$x = 3$

[1 mark]

$x =$ _____

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

-7 -7

$y = 43$

[1 mark]

$y =$ _____

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

×4 ×4

$c = 32$

[1 mark]

$c =$ _____

Do not write outside the box

2 Here is a list of numbers.

10 8 2 11 12 15 4 4

2 (a) Write down the mode.

[1 mark]

Answer 4

2 (b) Work out the median.

[2 marks]

2 4 4 8 10 11 12 15

$\frac{8+10}{2} = \frac{18}{2} = 9$

Answer 9

2 (c) Work out the range.

[1 mark]

15 - 2 = 13

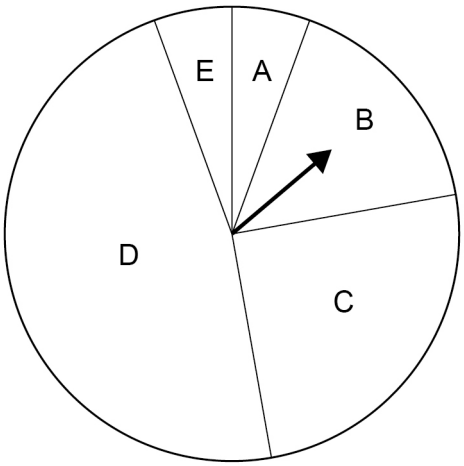
Answer

Turn over for the next question

7

Do not write outside the box

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 A and E

Do not write outside the box

3 (b) Two different spinners are spun.

One spinner has sections labelled with colours.

The other spinner has sections labelled with numbers.

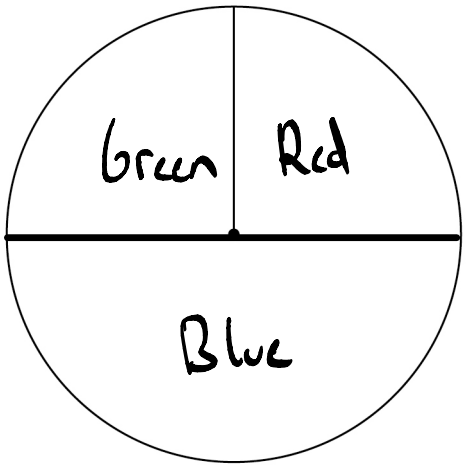
Here is a list of **all** the possible outcomes.

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

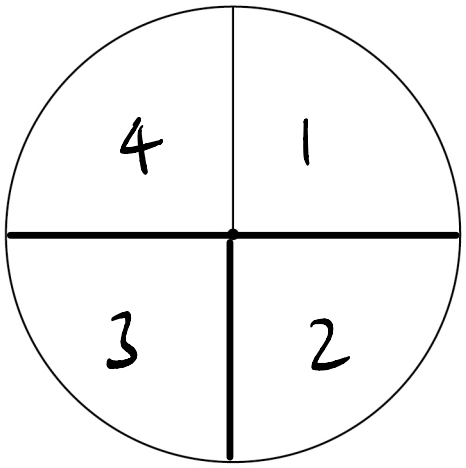
Show the possible sections on the two spinners.

[2 marks]

Colour



Number



Turn over for the next question

4

Do not write outside the box

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]

$9.5 - (0.2 \times 2) = 9.1\text{m}$

Answer _____

Do not write outside the box

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

subtract 1 then multiply by 5 -1 x5

The 1st term is 4

Work out the 3rd term.

[2 marks]

4 15 70

-1x5 -1x5

Answer _____

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

add 20 then divide by 2 +20 ÷2

The 2nd term is 50

Work out the 1st term.

[2 marks]

x2 $\frac{x+20}{2} = 50$ $x = 80$

$x + 20 = 100$

-20

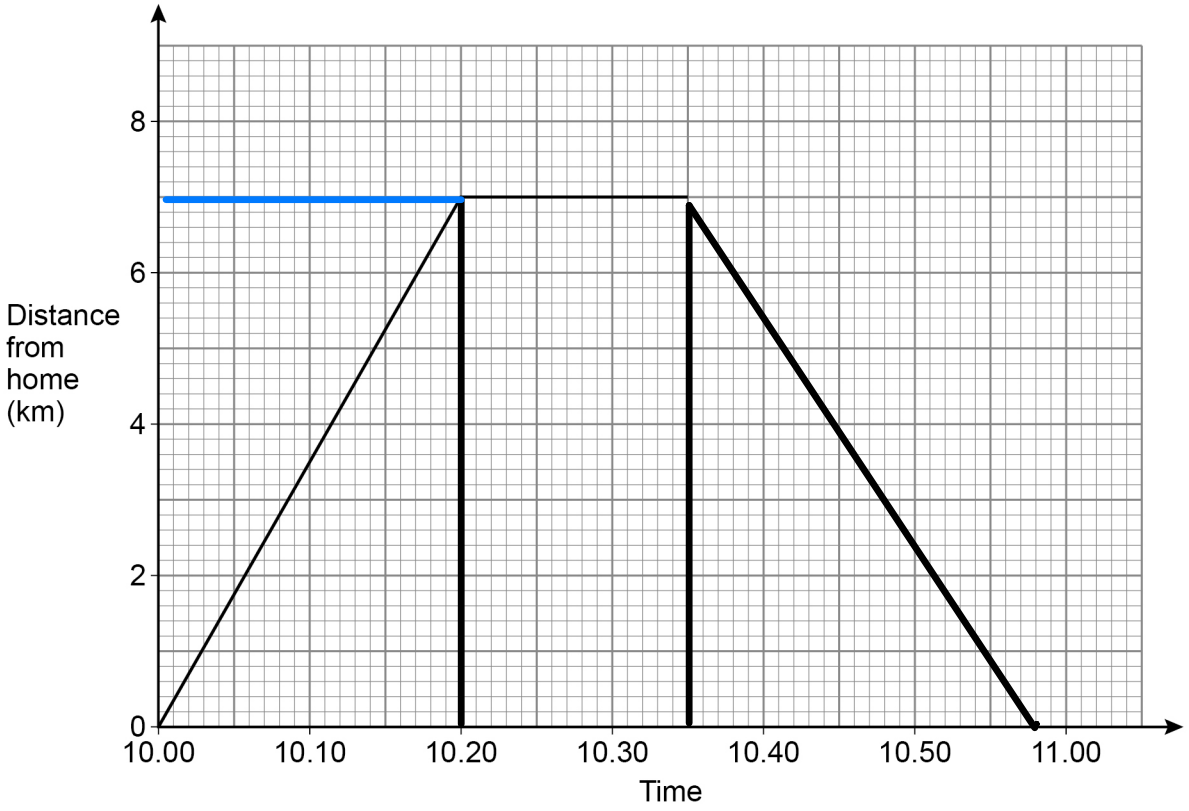
Answer 80

7

Do not write outside the box

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]

Answer 15 minutes

Do not write outside the box

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]

35+23 = 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
Sunday	1 pm to 3 pm

3 hours
2 hours
5 hours

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

[4 marks]

(25 x 10·2) + (11·80 x 5) = 314

Answer £ _____

8

Turn over ►

Do not write outside the box

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]

60 + 70 + 85 = 215g

$\frac{1}{5}$ of 1kg = 200g

$\frac{1}{4}$ kg = 250g

200g < 215g < 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 90 - 180	☐	✓	☐
One of the three angles of a triangle is reflex more than 180	☐	☐	✓

Do not write outside the box

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

[1 mark]

$p^{2+1} = p^3$

Answer p^3

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

[2 marks]

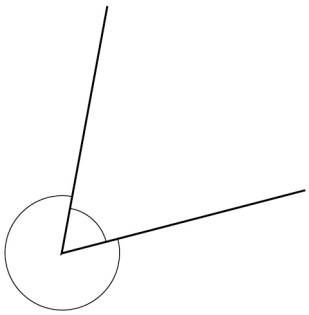
Answer $2a + 11c$

Turn over for the next question

9

Do not write outside the box

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]

9 parts = 360
1 part = 40
2 : 7
×40 80 : 280 ×40

Do not write outside the box

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

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

[2 marks]

c = 5, 6, 7, 8 ... c - d = 6

d = 3, 2, 1, 0 ...

$c =$ 6 $d =$ 0

12 (b) w is greater than 1 **and** less than 2 1.9

x is greater than 0 **and** less than 1 0.7

$w + x = 2.6$

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

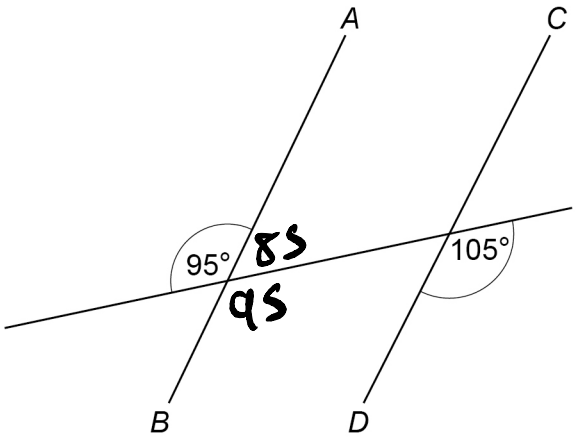
[2 marks]

$w =$ 1.9 $x =$ 0.7

6

Do not write outside the box

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]

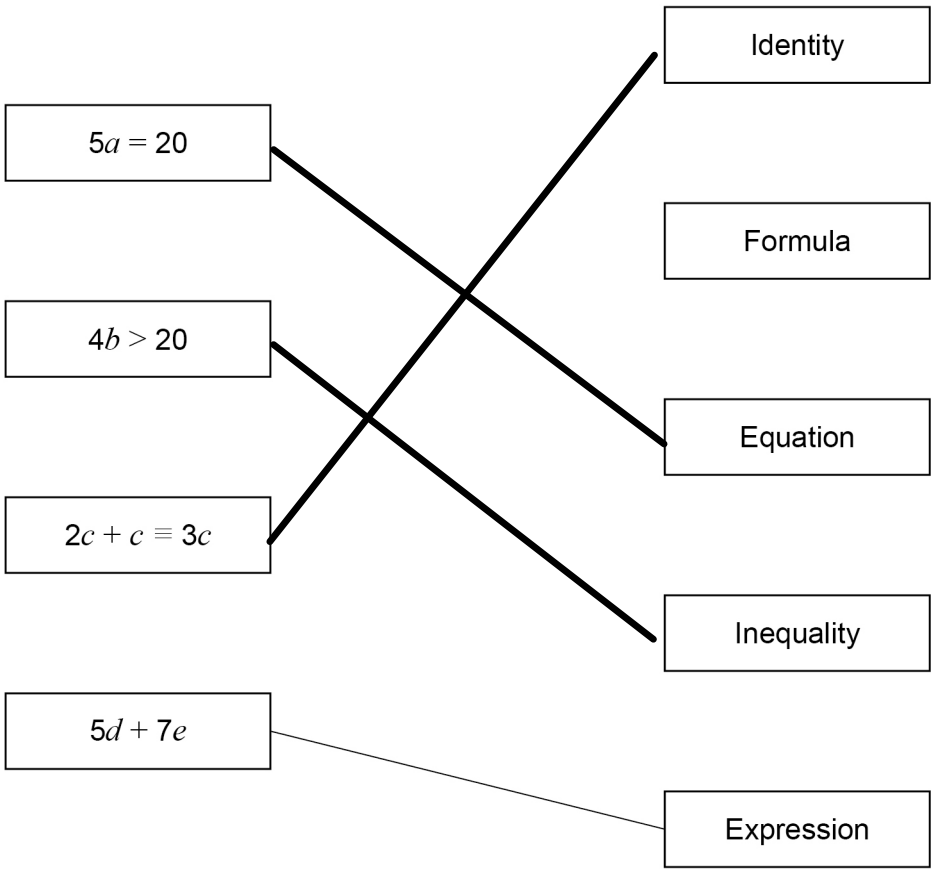
If parallel both angles given would be the same

Do not write outside the box

14 Match the algebra to the correct description.

One has been done for you.

[3 marks]



Turn over for the next question

5

Do not write outside the box

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]

$8s = 496 \quad s = 62$

$5s + 2l = 638$

$5(62) + 2l = 638$

$310 + 2l = 638$

-310

$2l = 328$

$\div 2$

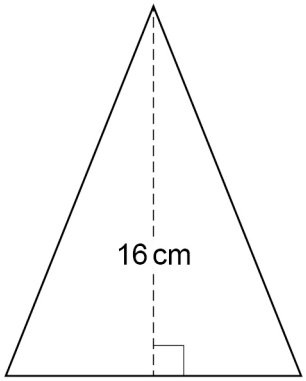
$l = 164$

Answer 164 g

Do not write outside the box

16 The rectangle and the triangle have the same area.

Not drawn accurately



Work out the length of the rectangle.

[3 marks]

$\frac{12 \times 16}{2} = 96 cm^2$ $\frac{96}{7.5} = 12.8$

Answer 12.8 cm

Turn over for the next question

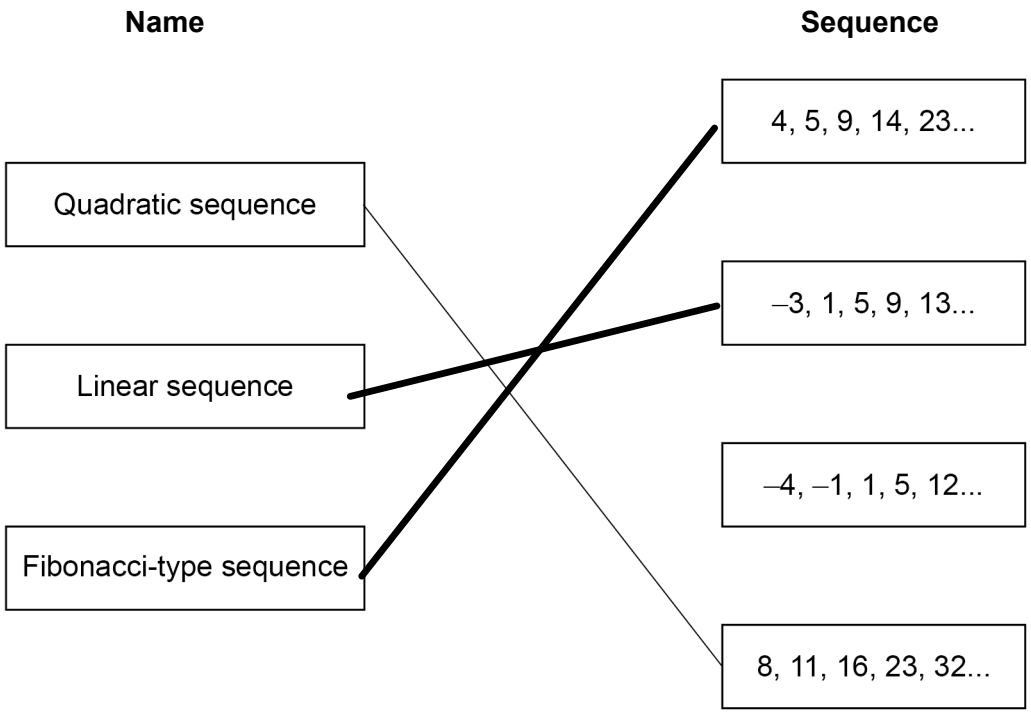
7

Do not write outside the box

17 Match the name to the correct sequence.

One has been done for you.

[2 marks]



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]

$1 - 0.04 = 0.96$

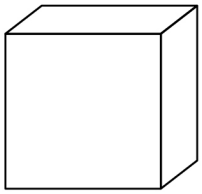
$1{,}000{,}000 \times 0.96^5 = 815{,}372.64...$

Answer 815,373

Do not write outside the box

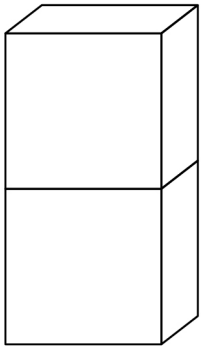
19 Here is cuboid A.

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]

One face is overlapping and covered

7

Do not write outside the box

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

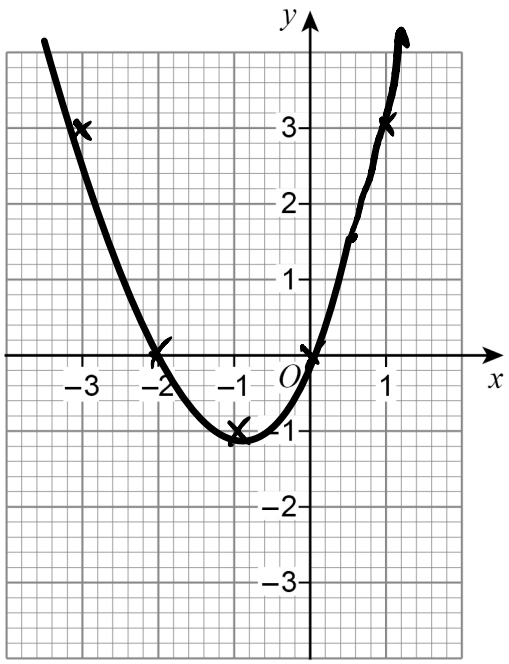
[2 marks]

$(-2)^2 + 2(-2)$

x	–3	–2	–1	0	1
y	3	0	–1	0	3

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

[2 marks]



Do not write outside the box

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.

S : B
2 : 5 7 parts = 2,450
×350
700 : 1750 1 part = 350

Does each brother receive more than £430 ?

You **must** show your working.

[4 marks]

$\frac{1750}{4} = 437.50$

Yes, 437.50 > 430

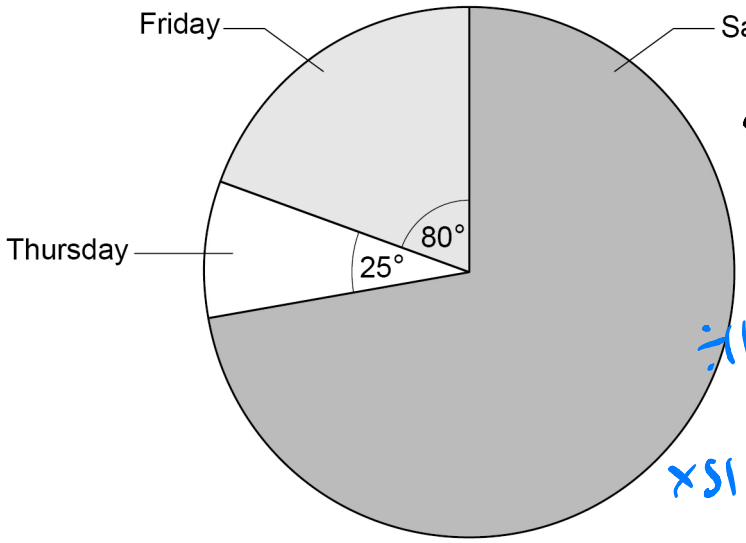
Turn over for the next question

8

Do not write outside the box

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

Not drawn accurately



80 - 25 = 55

55° = 132 people

÷11

5° = 12 people

×51

255 = 612 people

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

Work out the number of people on Saturday.

[3 marks]

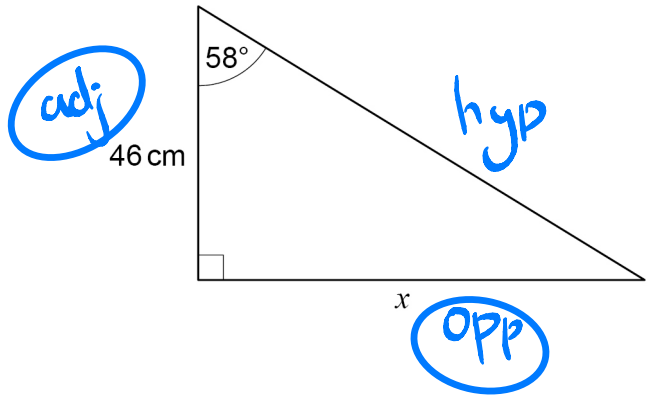
360 - 80 - 25 = 255

Answer _____

Do not write outside the box

23 Use trigonometry to work out the value of x.

Not drawn accurately



SOH CAH TOA

[3 marks]

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

$x = 46 \tan 58 = 73.6$

$x =$ 73.6 cm

Turn over for the next question

6

Do not write outside the box

24 Millie is estimating the value of $\dfrac{1}{\left(\sqrt[3]{8.34}\right)^2 \times 10.21}$ $\approx$ $\dfrac{1}{(\sqrt[3]{8})^2 \times 10}$

She rounds each decimal number to 1 significant figure.

24 (a) Work out Millie's estimate.

You **must** show your working.

[2 marks]

$\dfrac{1}{2^2 \times 10} = \dfrac{1}{40}$

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]

The divisors have decreased increasing the answer

Do not write outside the box

25 (a) Factorise $x^2 + 8x + 15$ **[2 marks]**

x = 15
t = 8

1, 15
3, 5

(x+5)(x+3)

Answer _____

25 (b) Write down the **two** solutions of $(y + 2)(y - 4) = 0$ **[1 mark]**

Answer y = 4 or -2

y+2=0
y=-2

y-4=0
y=4

END OF QUESTIONS

6