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

Monday 13 November 2023 **Morning**

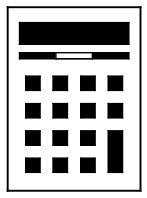
Time allowed: 1 hour 30 minutes

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 **Work out 10% of 170 [1 mark]**

_____

_____

_____

Answer _____

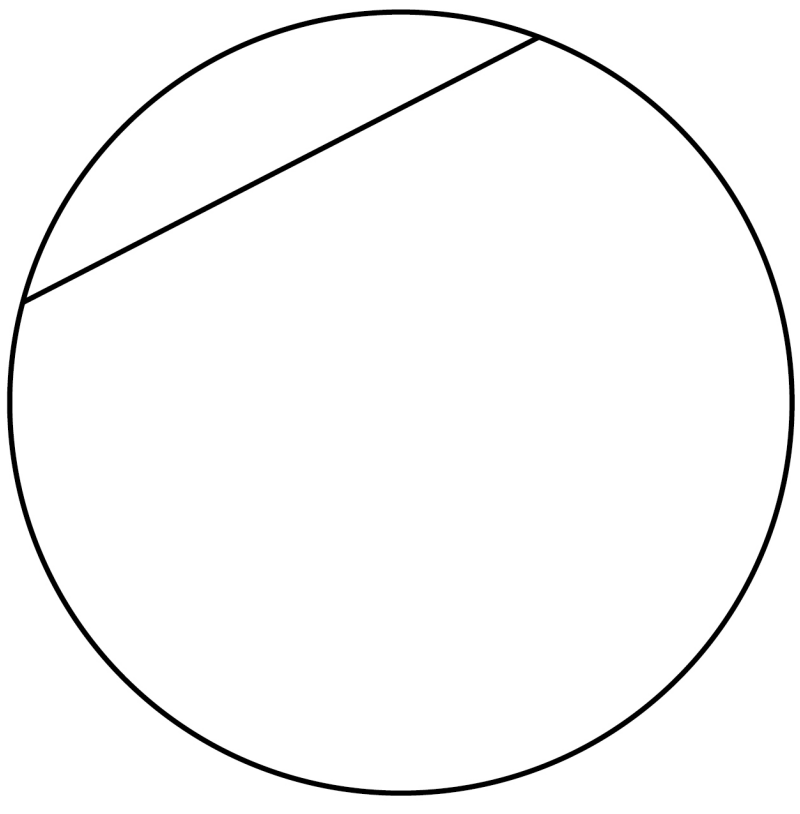
2 **Write down the value of the digit 7 in 34 728**
[1 mark]

Answer _____

3 (a) Write down the name of a triangle with three EQUAL sides. [1 mark]

Answer _____

3 (b) Write down the name for the straight line inside this circle. [1 mark]



Answer _____

[Turn over]

4 **Write down ALL the factors of 45 [2 marks]**

Answer

6

5 (a) $d = g^2 - 2h$

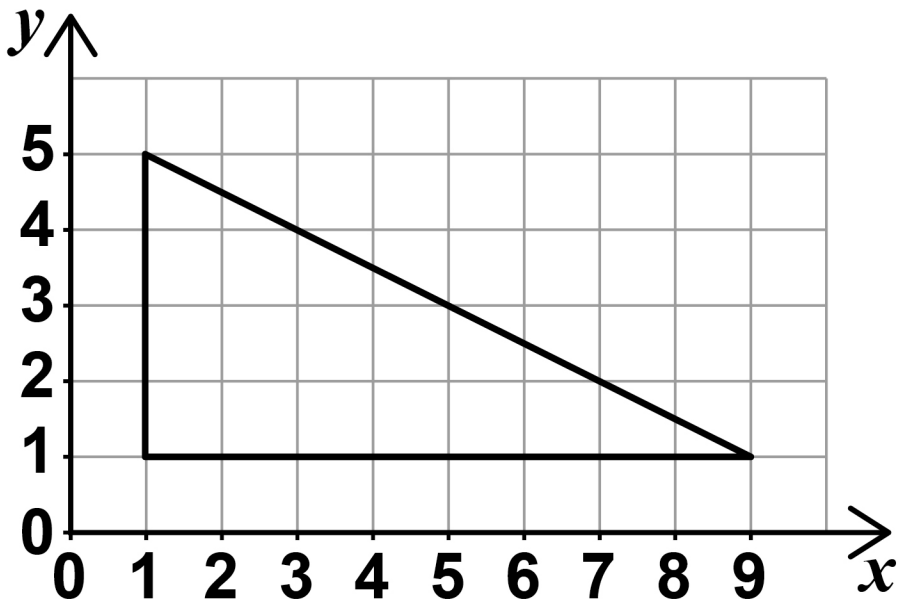
Work out the value of d when $g = 15$ and $h = 63$ [2 marks]

$d =$ _____

5 (b) Rearrange $m = n + k$ to make n the subject. [1 mark]

$n =$ _____

6 **Here is a right-angled triangle on a centimetre grid.**



6 (a) **Write down the coordinates of the midpoint of the LONGEST side. [1 mark]**

Answer **(_____ , _____)**

6 (b) **Work out the area of the triangle. [1 mark]**

Answer _____ **cm^2**

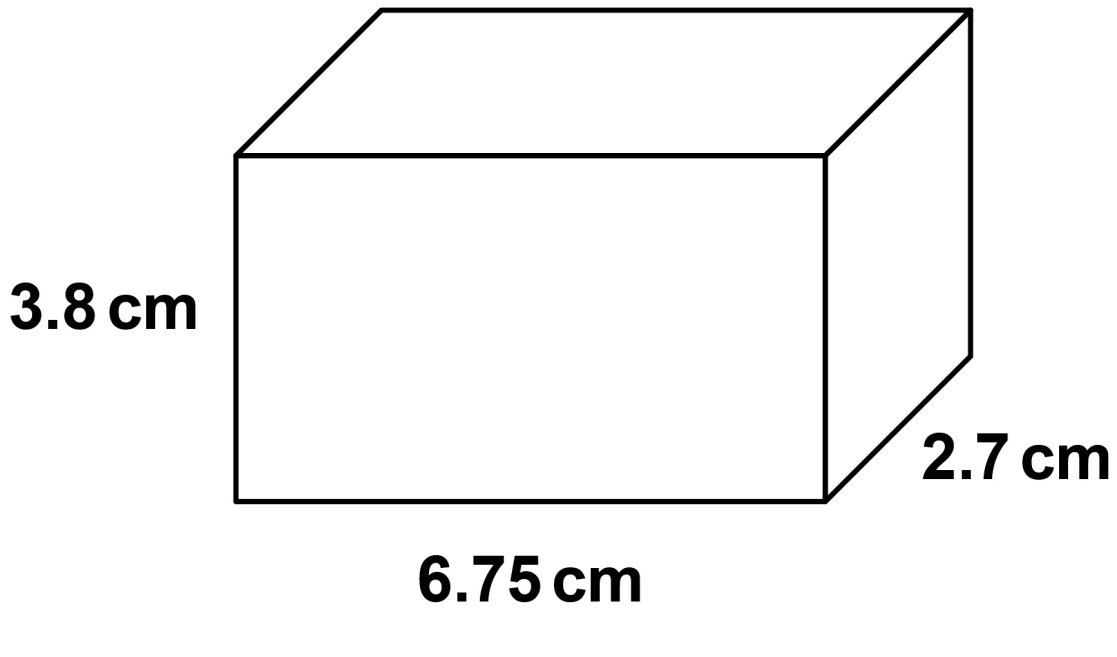
5

7 **The total cost of broadband for 5 months is £99.20**

At the same monthly rate, work out the total cost of broadband for 2 YEARS. [3 marks]

Answer £ _____

8 **Here is a cuboid.**



Work out the volume of the cuboid.

Give your answer to 1 decimal place. [2 marks]

Answer cm^3

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[Turn over]

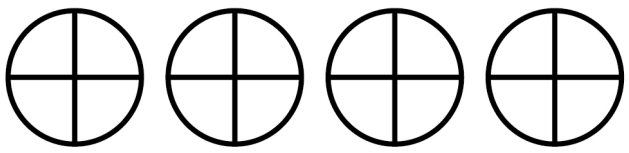
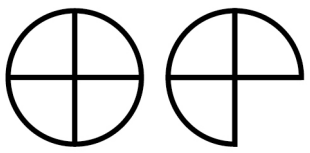
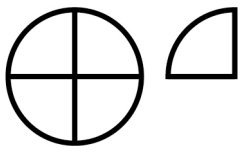
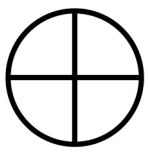
9 **Nicki asked 30 people to name their favourite crisp flavour.**

Here are the results.

Salt and Vinegar	**16**
Ready Salted	**7**
Cheese and Onion	**5**
Prawn Cocktail	**2**

Nicki drew this pictogram to represent the results.

FAVOURITE CRISP FLAVOUR

Salt and Vinegar	
Ready Salted	
Cheese and Onion	
Prawn Cocktail	

What TWO mistakes has Nicki made? [2 marks]

Mistake 1 _____

_____

_____

Mistake 2 _____

_____

_____

7

10 Sanjit buys 1.75 kg of potatoes and 4 kg of leeks.

The total cost is £9.03

The potatoes cost 84p per kg

Work out the cost per kg of the leeks. [4 marks]

Answer £ _____ per kg

[Turn over]

11 (a) **Simplify fully** $2x + 9y + 1 + 8x - 5y - 7$
[3 marks]

Answer

11 (b) **Circle the expression that is equivalent to** $0.5a^2$
[1 mark]

a $\frac{a}{2}$ $\frac{a^2}{2}$ $\frac{a^2}{4}$

8

BLANK PAGE

[Turn over]

12 **Here are the subjects available in year 12 at a school.**

BLOCK 1	BLOCK 2	BLOCK 3	BLOCK 4
Maths (M)	Geography (G)	English (E)	Spanish (S)
History (H)	Drama (D)	Physics (P)	Biology (B)
French (F)	Chemistry (C)	ICT (I)	Art (A)

Students choose THREE subjects.

They CANNOT choose more than one subject from a block.

Lian decides

to study Maths

NOT to study Geography, Chemistry, Physics or ICT.

By listing, on the opposite page, show that there are SEVEN groups of three subjects that Lian could choose. [3 marks]

SUBJECT 1	SUBJECT 2	SUBJECT 3

[Turn over]

13 There are 1400 students at a college.

A student is chosen at random.

13 (a) The probability that the student is taking a GCSE resit is 0.09

How many of the students are taking a GCSE resit?
[2 marks]

Answer _____

13 (b) The probability that the student is studying

A-levels is 0.67

Core Maths is 0.48

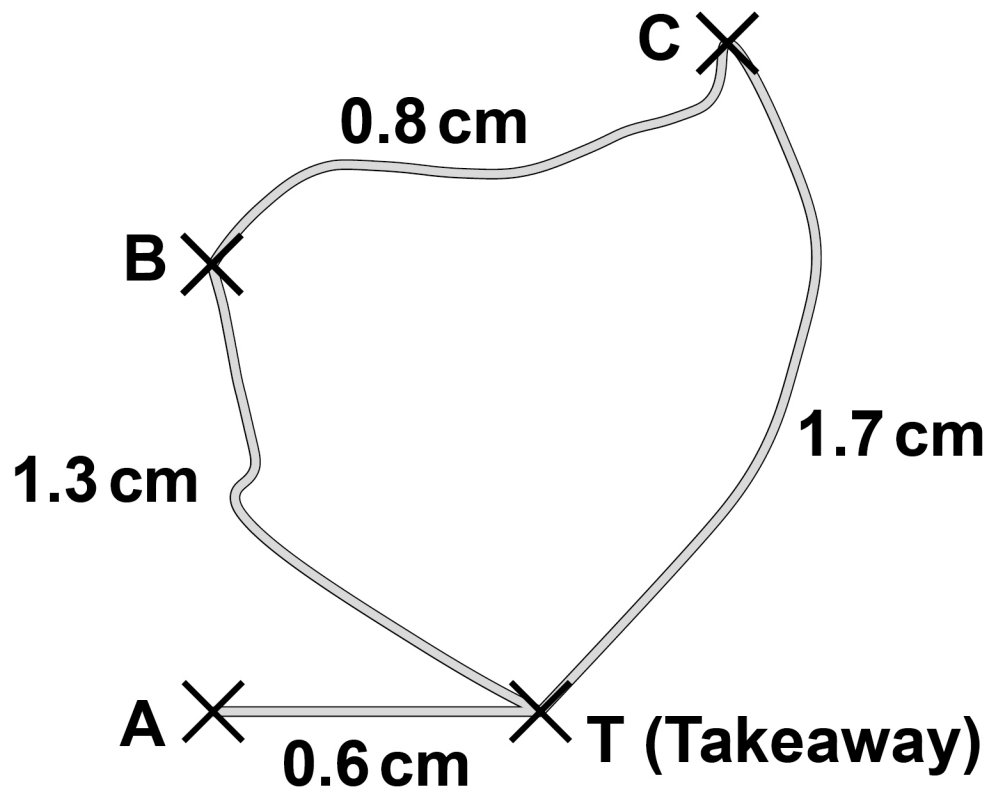
Show that some students are studying A-levels AND Core Maths. [2 marks]

7

14 **Des delivers takeaways to houses A, B and C.**

The diagram is not drawn accurately.

SCALE: 1 cm represents 3 miles



Des drives

from T to A and back

and

from T to B, then B to C, then C to T.

Des is paid

40p for each mile he drives

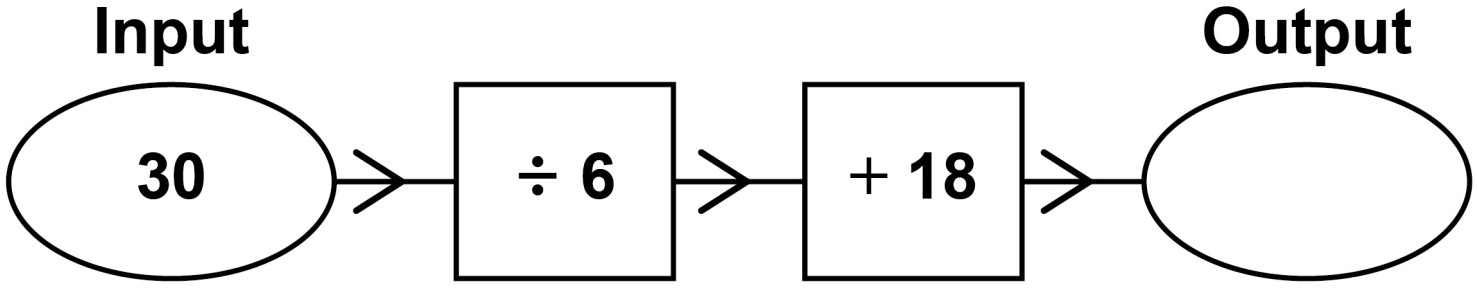
and

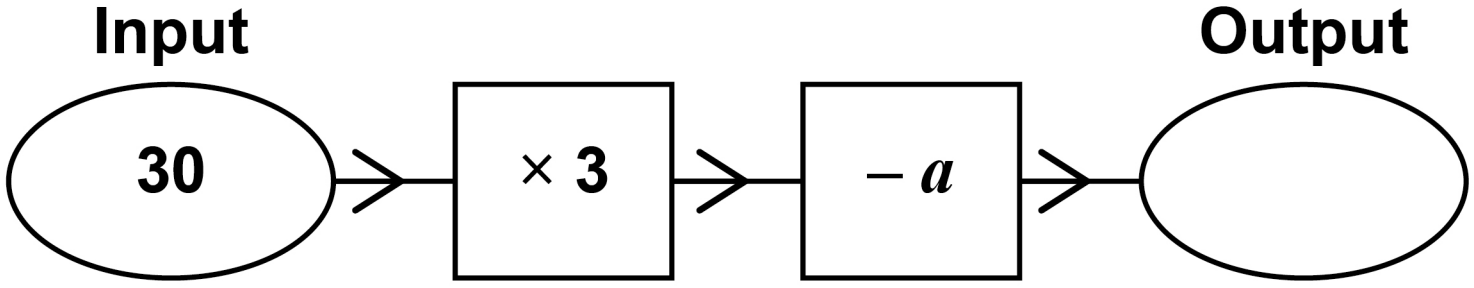
£1.35 for each house he delivers to.

How much is Des paid in total for this work?
[4 marks]

Answer £ _____

15 **Here are two number machines.**





The outputs are the same.

Work out the value of a. [4 marks]

a =

[Turn over]

8

16 Which is closer in value to 2.5

$\frac{3}{4}$ or $4\frac{1}{5}$?

You MUST show your working. [3 marks]

Answer

BLANK PAGE

[Turn over]

17 **A computer game has five levels.**

Each level has a maximum number of points.

These maximum numbers form an ARITHMETIC PROGRESSION.

The table shows the numbers for the first three levels.

Level 1	**400**
Level 2	**750**
Level 3	**1100**
Level 4	
Level 5	

Your score is the TOTAL of the points you achieve in EACH of the five levels.

Isaac's best score is 1250 points LESS than the highest possible score.

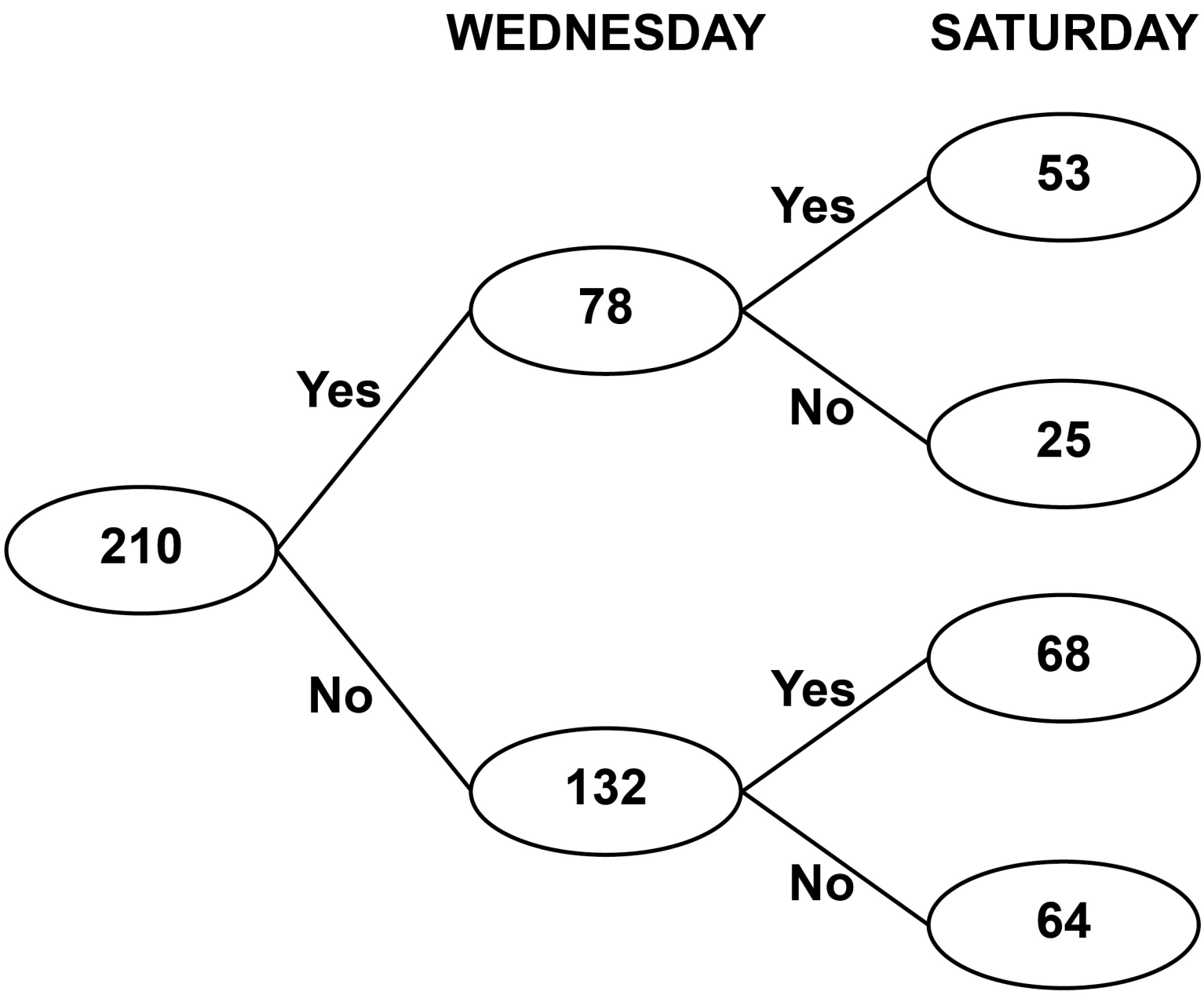
Work out his best score. [4 marks]

Answer

18 A walking group has 210 members.

One week, the group organised a walk on Wednesday and a walk on Saturday.

The frequency tree shows how many members went on the walks.

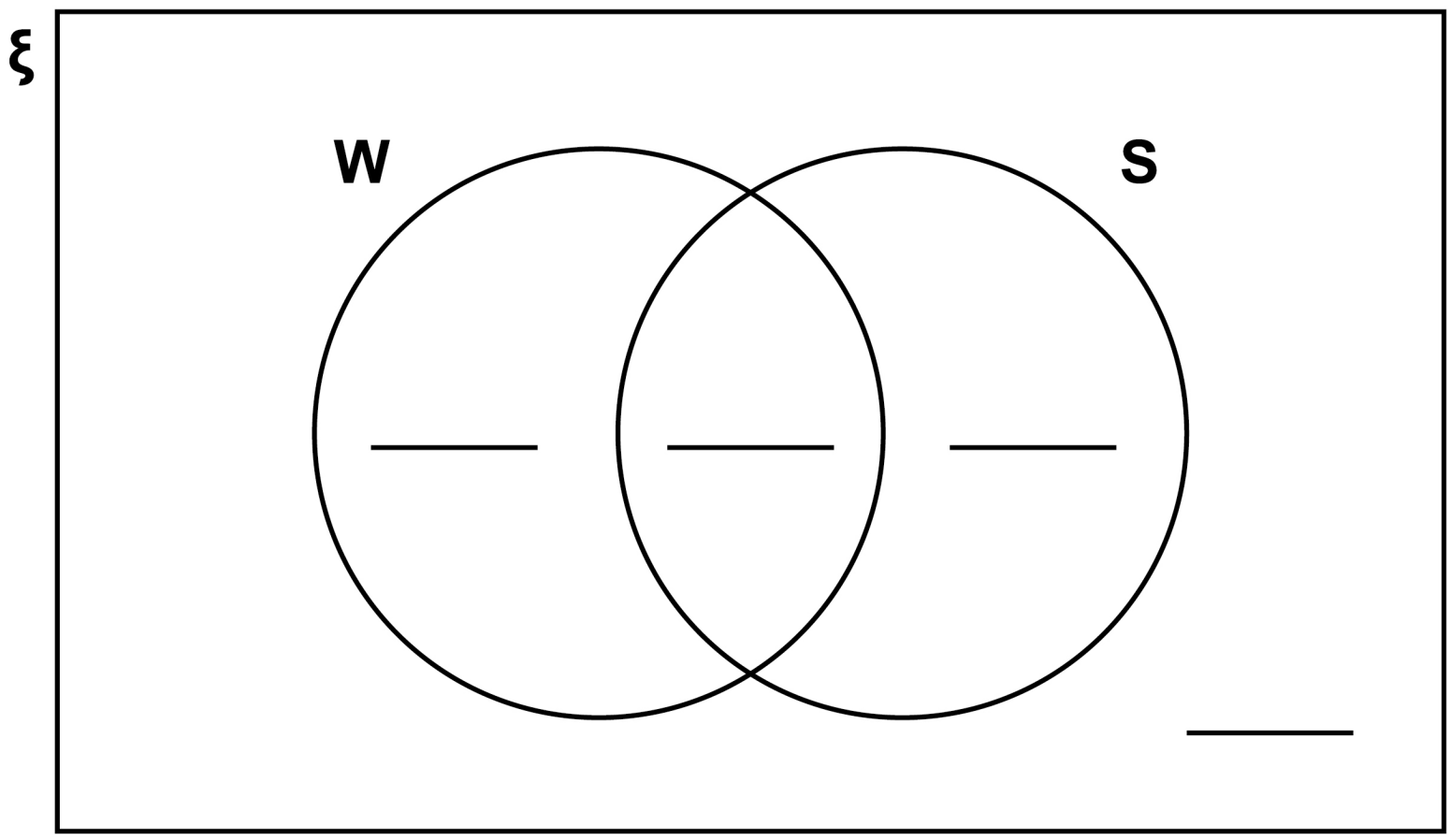


Show the information on the Venn diagram.
[4 marks]

ξ = 210 members

W = members who went on the Wednesday walk

S = members who went on the Saturday walk



[Turn over]

19 The length of a line is 8 cm to the nearest centimetre.

Complete the error interval. [2 marks]

Answer _____ cm ⩽ length < _____ cm

20 Which of these is an estimate?

Tick ONE box. [1 mark]

☐ lowest value of UNGROUPED data

☐ range of UNGROUPED data

☐ modal class of GROUPED data

☐ mean of GROUPED data

7

BLANK PAGE

[Turn over]

21 **Carly's total annual pay = salary + bonus**

	SALARY	BONUS
LAST YEAR	£26 000	£4000
THIS YEAR	6% increase	9% decrease

Work out the percentage change in her total annual pay.

State whether it is an increase or a decrease.
[4 marks]

Answer

[Turn over]

22 **The first two cube numbers are 1 and 8**

Show that

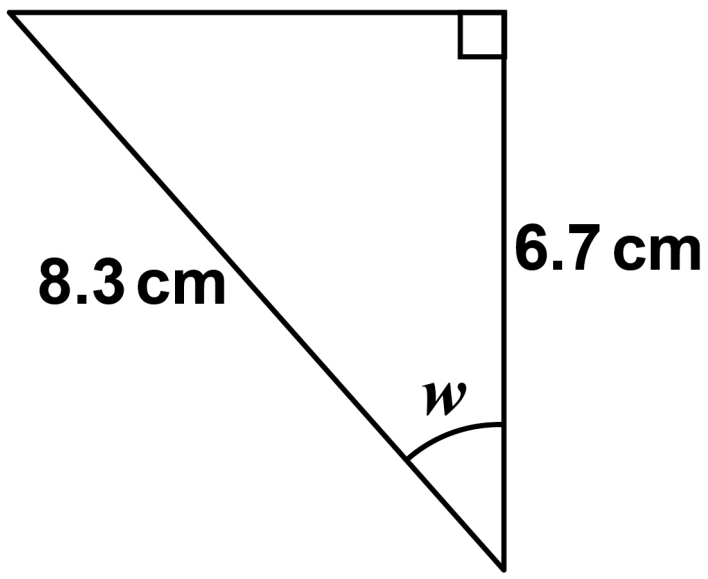
the 3rd cube number can be written as the sum of three different prime numbers.

[3 marks]

□ = □ + □ + □

23 **Use trigonometry to work out the size of angle w.**
[3 marks]

The diagram is not drawn accurately.



w = _____ °

[Turn over]

10

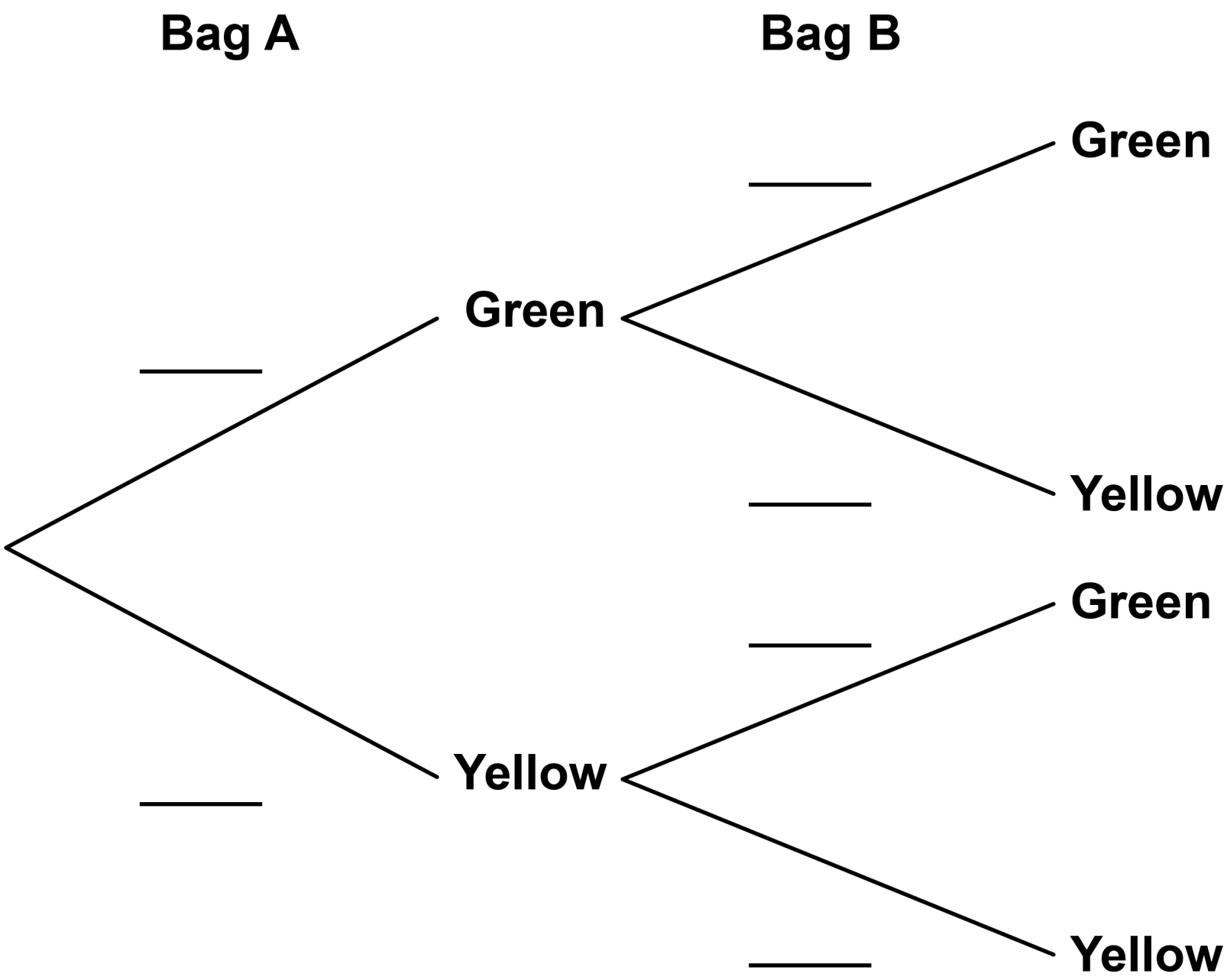
24 Two bags contain only green discs and yellow discs.

Bag A contains 1 green disc and 4 yellow discs.

Bag B contains 3 green discs and 7 yellow discs.

One disc is picked at random from each bag.

24 (a) Complete the tree diagram with the correct probabilities. [2 marks]



24 (b) Work out the probability that BOTH discs are green.
[2 marks]

Answer _____

[Turn over]

25 **Solve these simultaneous equations.**

$7x + 2y = 100$

$3x + 2y = 48$

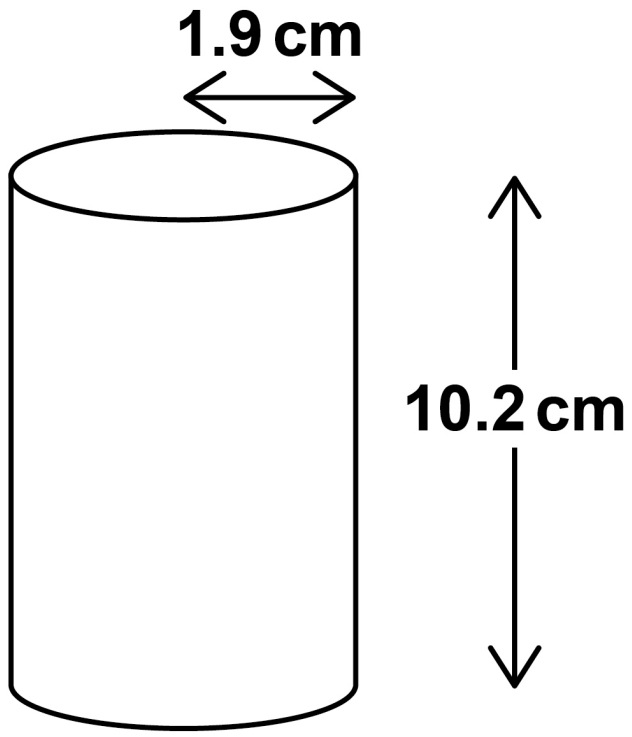
[3 marks]

x = _____ y = _____

[Turn over]

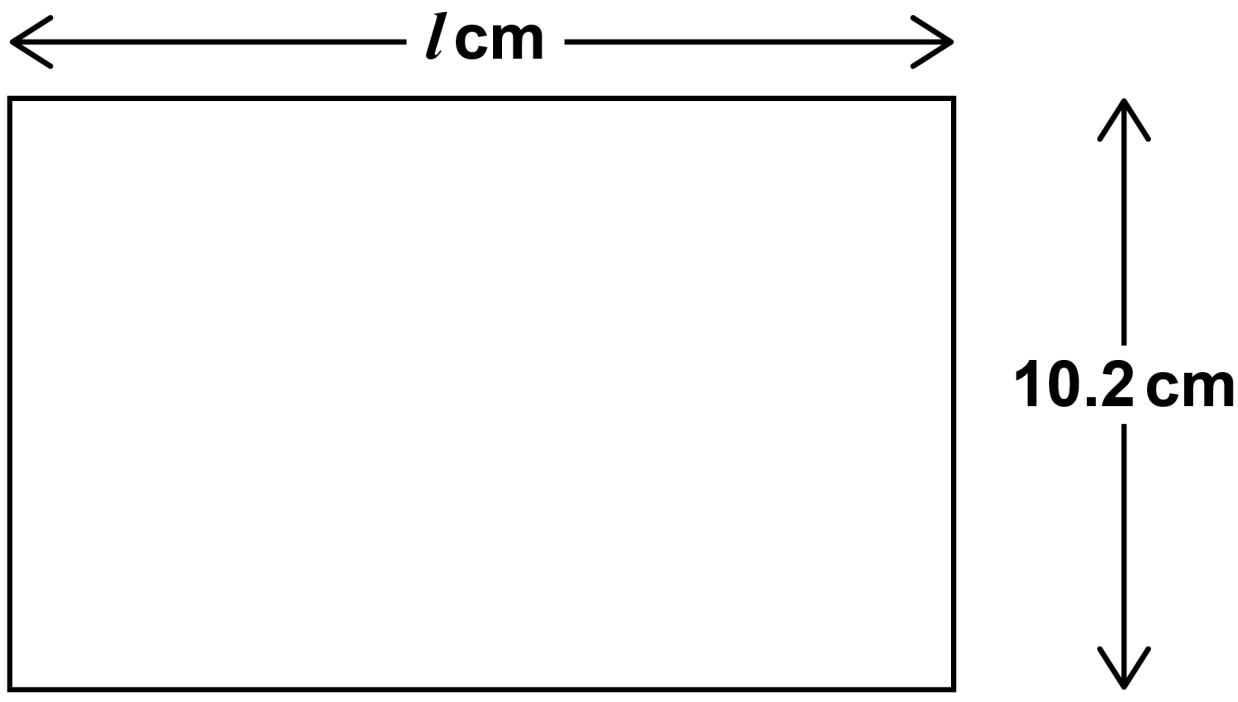
7

26 An open cardboard cylinder has radius 1.9 cm and height 10.2 cm



26 (a) Harry assumes that the net of the cylinder is a rectangle with length l cm

The diagram is not drawn accurately.

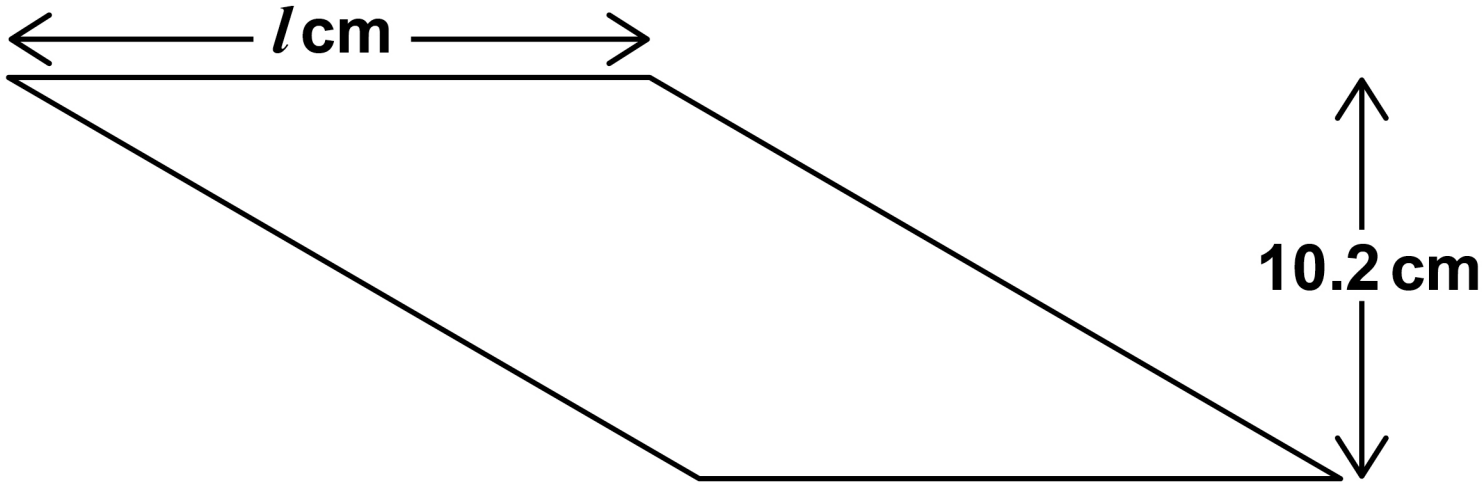


Work out the area of this rectangle. [3 marks]

Answer _____ **cm^2**

In fact, the net is a parallelogram, not a rectangle.

The diagram is not drawn accurately.



26 (b) What does this mean about the AREA of the net?

Tick ONE box. [1 mark]

☐ **It is less than the area of the rectangle**

☐ **It is equal to the area of the rectangle**

☐ **It is more than the area of the rectangle**

26 (c) **What does this mean about the PERIMETER of the net?**

Tick ONE box. [1 mark]

☐ **It is less than the perimeter of the rectangle**

☐ **It is equal to the perimeter of the rectangle**

☐ **It is more than the perimeter of the rectangle**

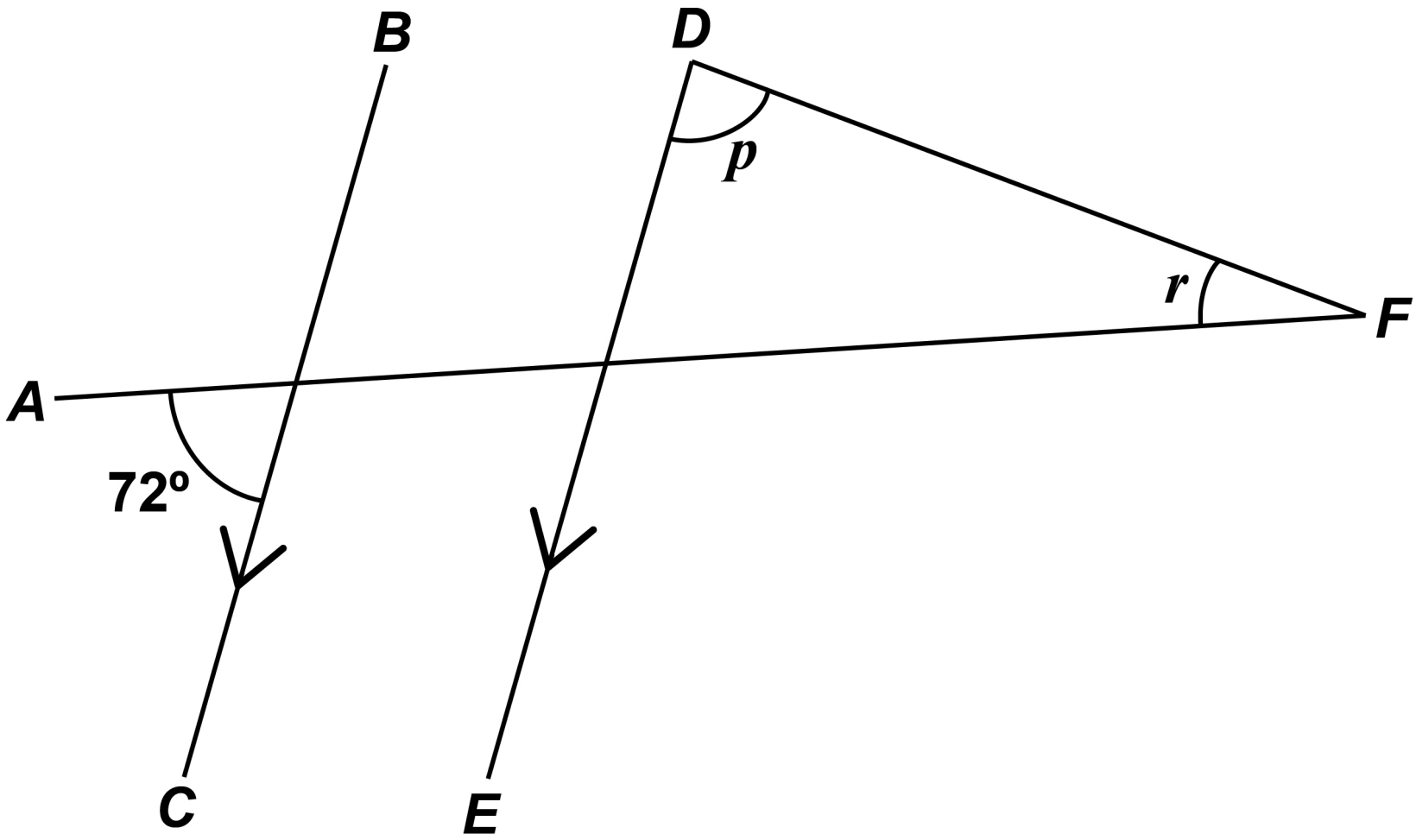
5

[Turn over]

27 ***AF*, *BC*, *DE* and *DF* are straight lines.**

***BC* and *DE* are parallel.**

The diagram is not drawn accurately.



***p* is three times *r*.**

Work out the size of angle *p*. [3 marks]

$p =$ _____ °

END OF QUESTIONS

3

Additional page, if required.

Write the question numbers in the left-hand margin.

Additional page, if required.

Write the question numbers in the left-hand margin.

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For Examiner's Use	
Pages	Mark
4–6	
7–8	
9–13	
14–16	
18–21	
22–25	
26–29	
30–32	
34–37	
38–41	
42–45	
46–47	
TOTAL	