A

AQA

Surname _____

Other Names _____

Centre Number _____

Candidate Number _____

Candidate Signature _____

I declare this is my own work.

GCSE

MATHEMATICS

F

Foundation Tier Paper 3 Calculator

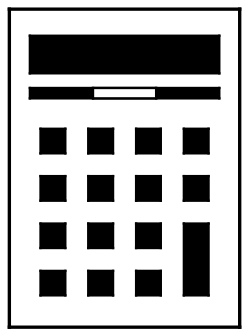
8300/3F

Time allowed: 1 hour 30 minutes

At the top of the page, write your surname and other names, your centre number, your candidate number and add your signature.

[Turn over]

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 What is $\frac{1}{4}$ as a percentage?

Circle your answer. [1 mark]

10% 25% 40% 75%

2 Circle the number that is a factor of 10 [1 mark]

7 6 5 4

3 Circle the value of the digit 9 in 0.094 [1 mark]

$\frac{9}{100}$ $\frac{9}{10}$ $\frac{1}{90}$ $\frac{1}{9}$

4 Simplify $4 \times 2c$

Circle your answer. [1 mark]

$42c$ $16c$ $8c$ $6c$

5 (a) Write a suitable unit for measuring each amount.

One has been done for you.
[2 marks]

	Unit
Distance from London to Manchester	kilometres
Length of a pencil	
Mass of a pound coin	

6

5 (b) Times for the three parts of a journey are

- 20 minutes
- 40 minutes
- 1 hour 30 minutes.

Work out the TOTAL time for the journey.

Give your answer in hours.
[2 marks]

Answer _____ hours

6 **Pens cost 20p each.**

Rulers cost 60p each.

Saj buys some pens and some rulers.

He buys 8 rulers.

The total cost is £10

How many pens does he buy?
[3 marks]

9

Answer _____

[Turn over]

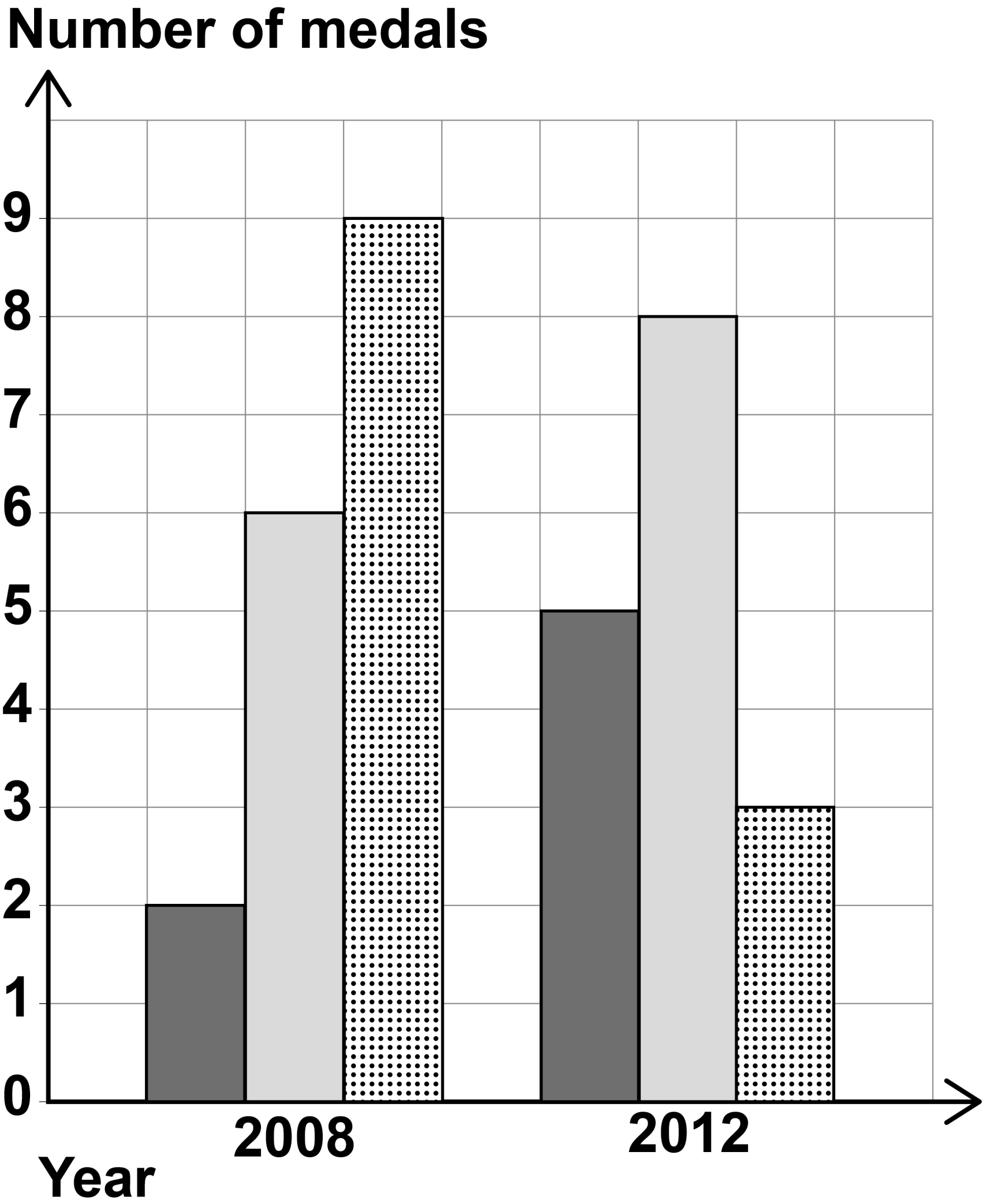
5

7 The bar chart, on the opposite page, shows the number of medals won by a country at events in 2008 and 2012

7 (a) Complete this statement about the medals won by the country in 2008 [1 mark]

number of Silver medals =

_____ × number of Gold medals


Number of medals
9
8
7
6
5
4
3
2
1
0
2008
2012
Year
KEY
Gold
Silver
Bronze

[Turn over]

7 (b) Show that the country won MORE medals in 2008 than in 2012
[2 marks]

7 (c) At the 2016 event the country won an EQUAL number of each type of medal.

Here is a statement about the medals won by the country in 2016

The total number of medals CANNOT be 25

Give a reason why the statement is correct. [1 mark]

_____

_____

_____

4

8 In this question use
1 litre = 1000 millilitres

A mixture is made using white paint and red paint.

amount of white paint =
amount of red paint ÷ 7

5.6 litres of red paint will make MORE than 6 litres of the MIXTURE.

How much more?

Give your answer in millilitres.

[4 marks]

Answer _____ **ml**

[Turn over]

9 Some students were asked about their daily exercise.

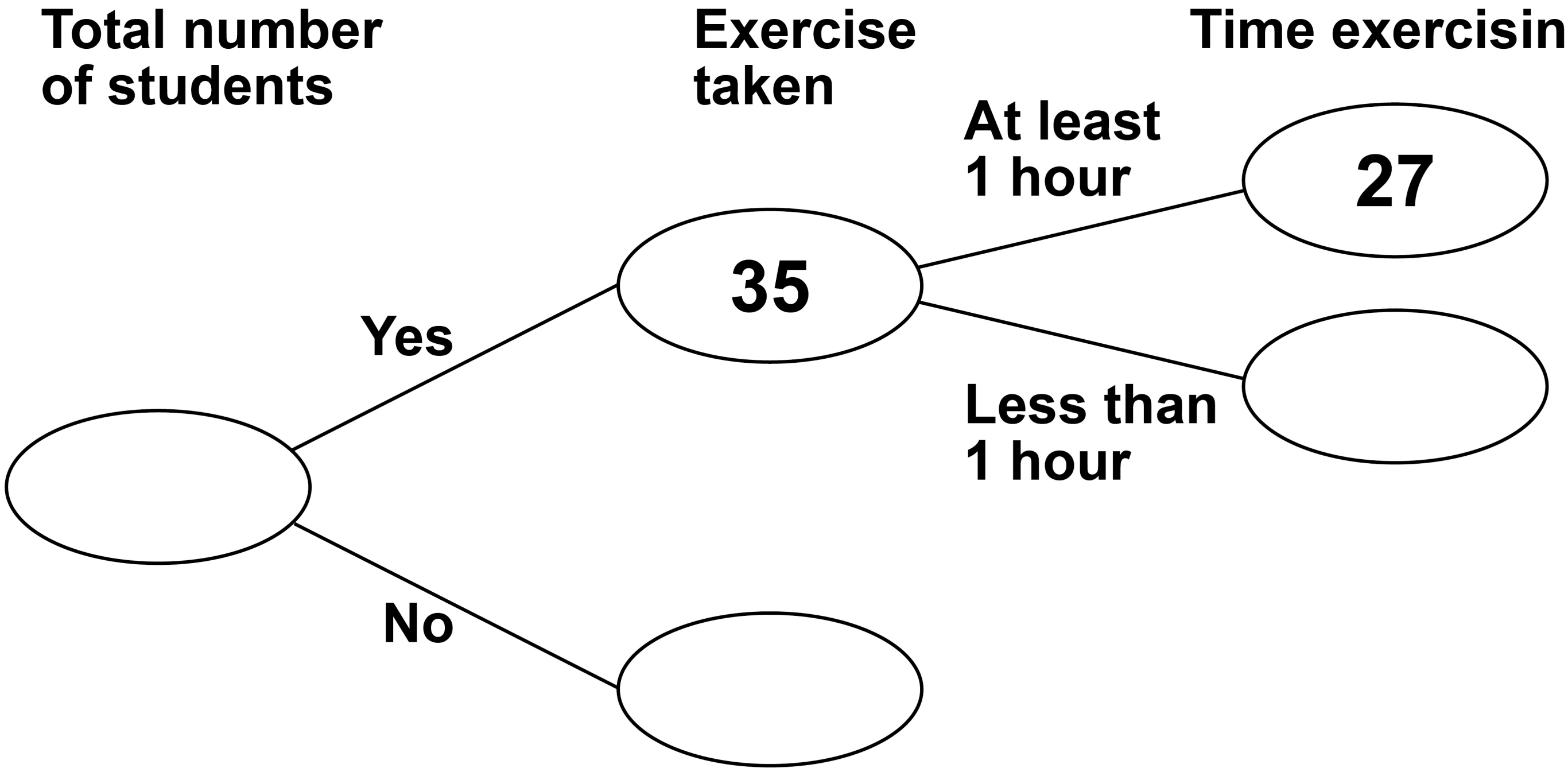
9 (a) 12 MORE students answered Yes than answered No.

Complete the frequency tree on the opposite page. [3 marks]

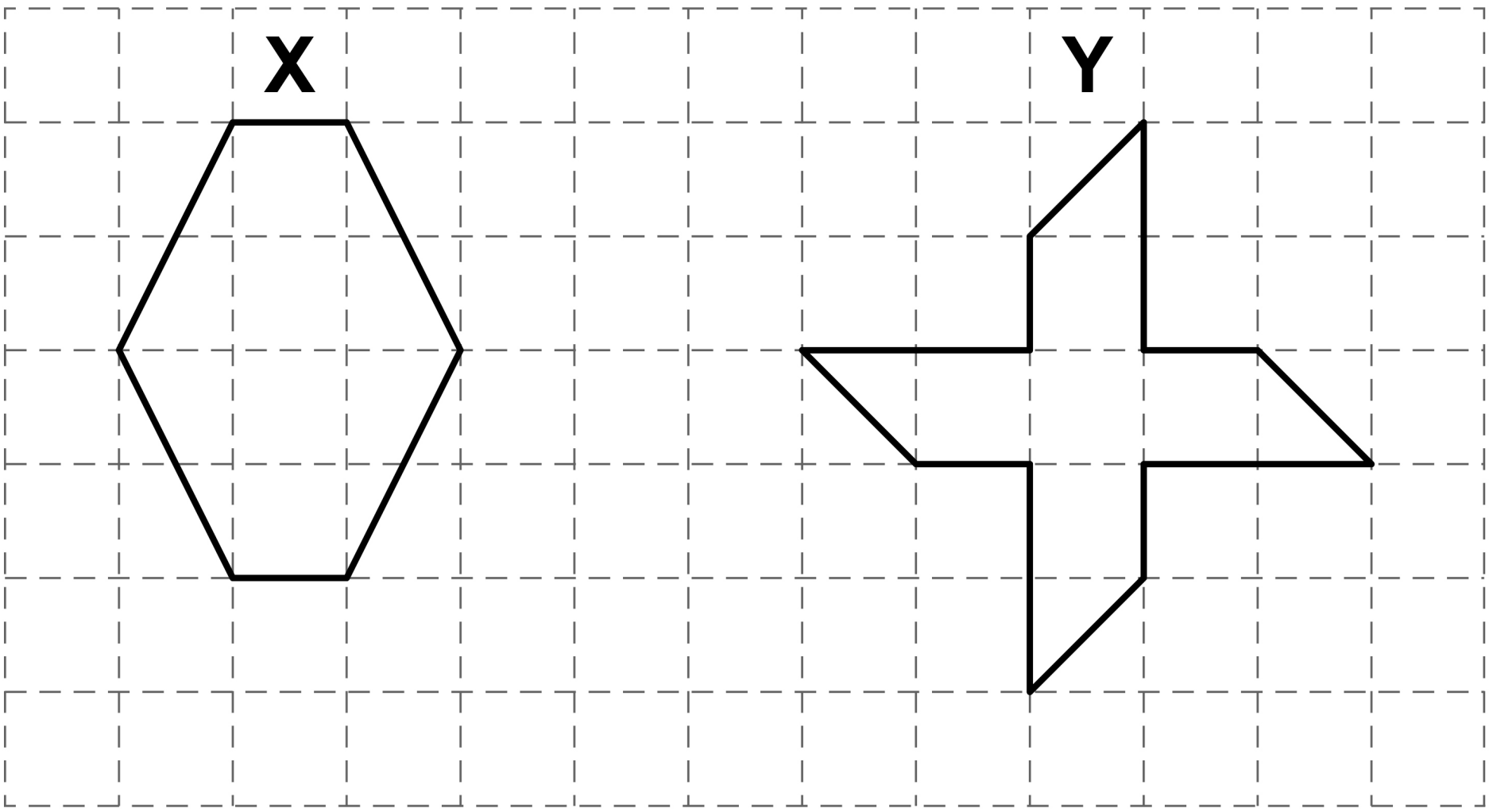
9 (b) One of the 35 students who answered Yes is chosen at random.

What is the probability that they exercise for at least 1 hour? [1 mark]

Answer _____


Total number of students
Exercise taken
Time exercising
At least 1 hour
27
35
Yes
Less than 1 hour
No

10 **Shapes X and Y are shown on a centimetre grid.**



10 (a) Circle the name of shape X.
[1 mark]

pentagon **hexagon**

octagon **decagon**

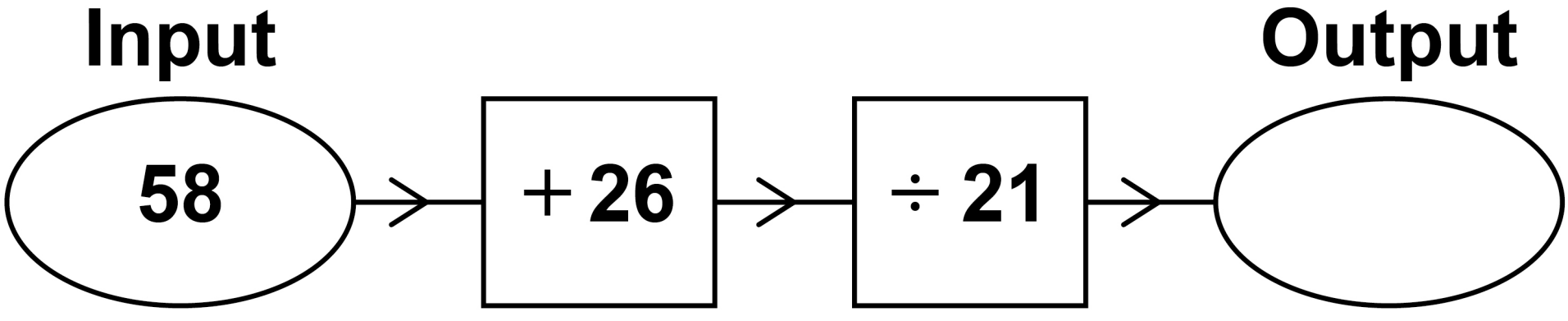
10 (b) Give a reason why shape Y is NOT a regular polygon. [1 mark]

10 (c) Complete these statements. [2 marks]

The number of lines of symmetry of shape X is

The order of rotational symmetry of shape Y is

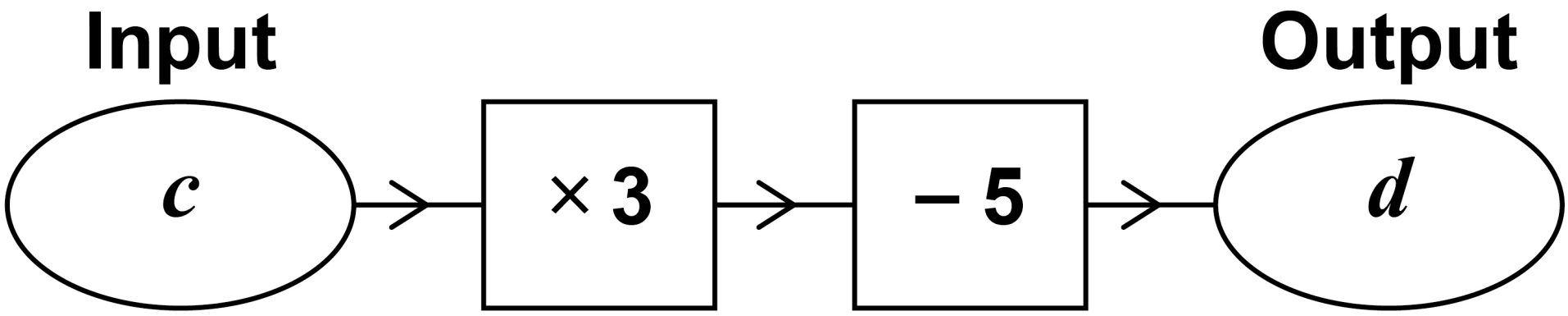
11 (a) Here is a number machine.



Work out the output. [1 mark]

Answer _____

11 (b) Here is a different number machine.



Work out a formula for d in terms of c. [2 marks]

Answer _____

7

12 (a) Simplify fully $9x + y - 6x + y$
[2 marks]

Answer _____

12 (b) Here are two expressions.

$8a$

$a^2 - b$

When $a = 25$ the expressions have the same value.

Work out the value of b. [3 marks]

b = _____

12 (c) Simplify $\frac{16w + 10}{2}$

Circle your answer. [1 mark]

$6w + 8$ $3w + 10$ $6w + 5$ $3w + 5$

13 In a bag,

number of green discs : number of blue discs = 20 : 11

Tick ONE box for each statement about the discs in the bag.
[2 marks]

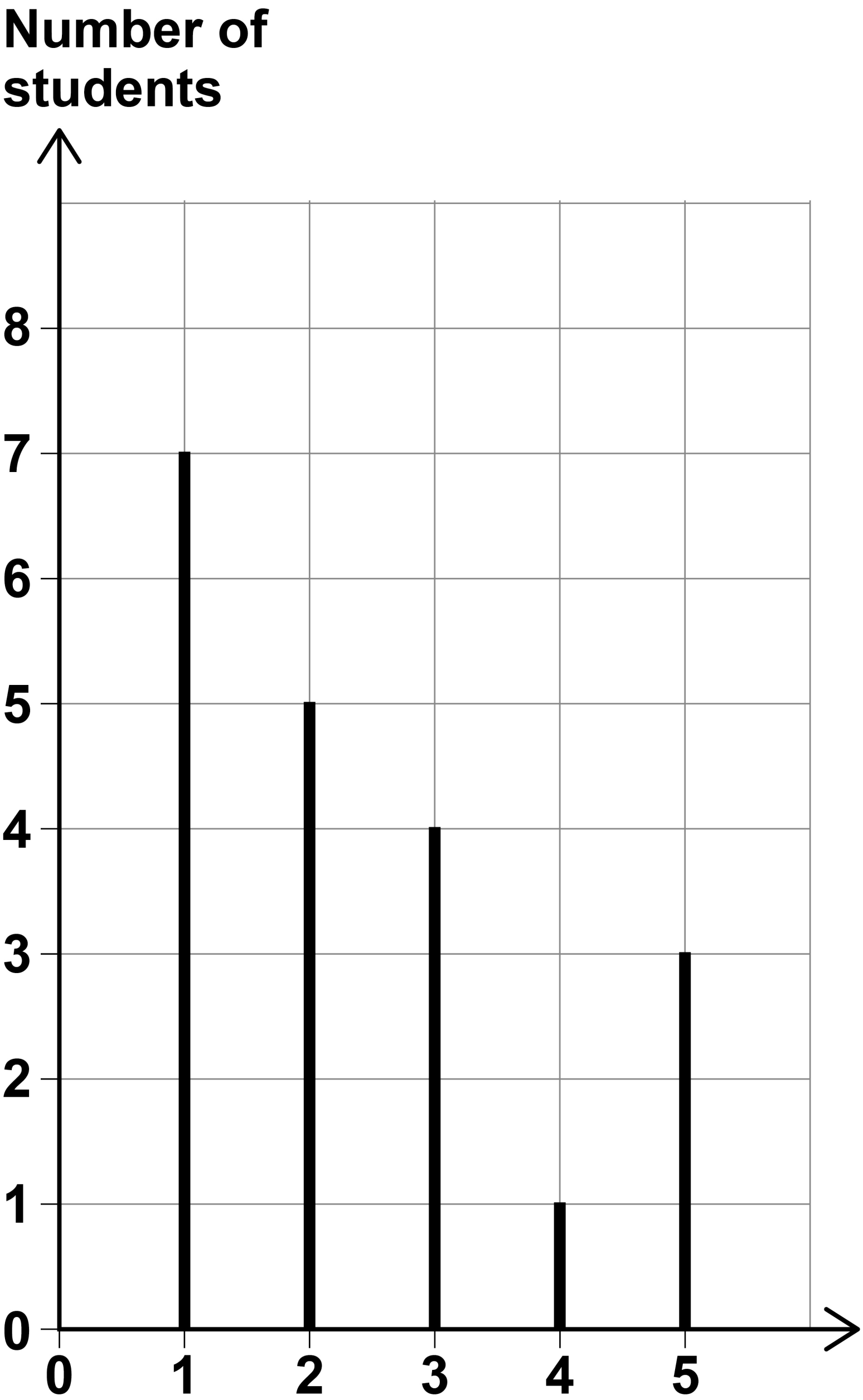
	True	False	Cannot tell
There are more green discs than blue discs.	☐	☐	☐
In total there are 31 discs.	☐	☐	☐

8

14 20 students are asked how many video games they played last month.

The chart, on page 26, shows information about the results.

[Turn over]


Number of students
8
7
6
5
4
3
2
1
0
0
1
2
3
4
5
Number of games

14 (a) How many students played MORE than 2 games? [1 mark]

_____

_____

Answer _____

[Turn over]

BLANK PAGE

14 (b) Work out the mean number of games played.

Give your answer as a decimal.
[3 marks]

Answer _____

[Turn over]

4

15 (a) Work out the multiple of 60 that is closest to 400 [2 marks]

Answer _____

15 (b) Work out the highest common factor (HCF) of 12 and 18
[2 marks]

Answer _____

16 An empty container is a cylinder of radius 3.5 cm and height 40 cm

A tennis ball is a sphere of radius 3.5 cm

Will six of the tennis balls fit in the container?

Tick a box.

☐ Yes

☐ No

Show working to support your answer. [2 marks]

[Turn over]

6

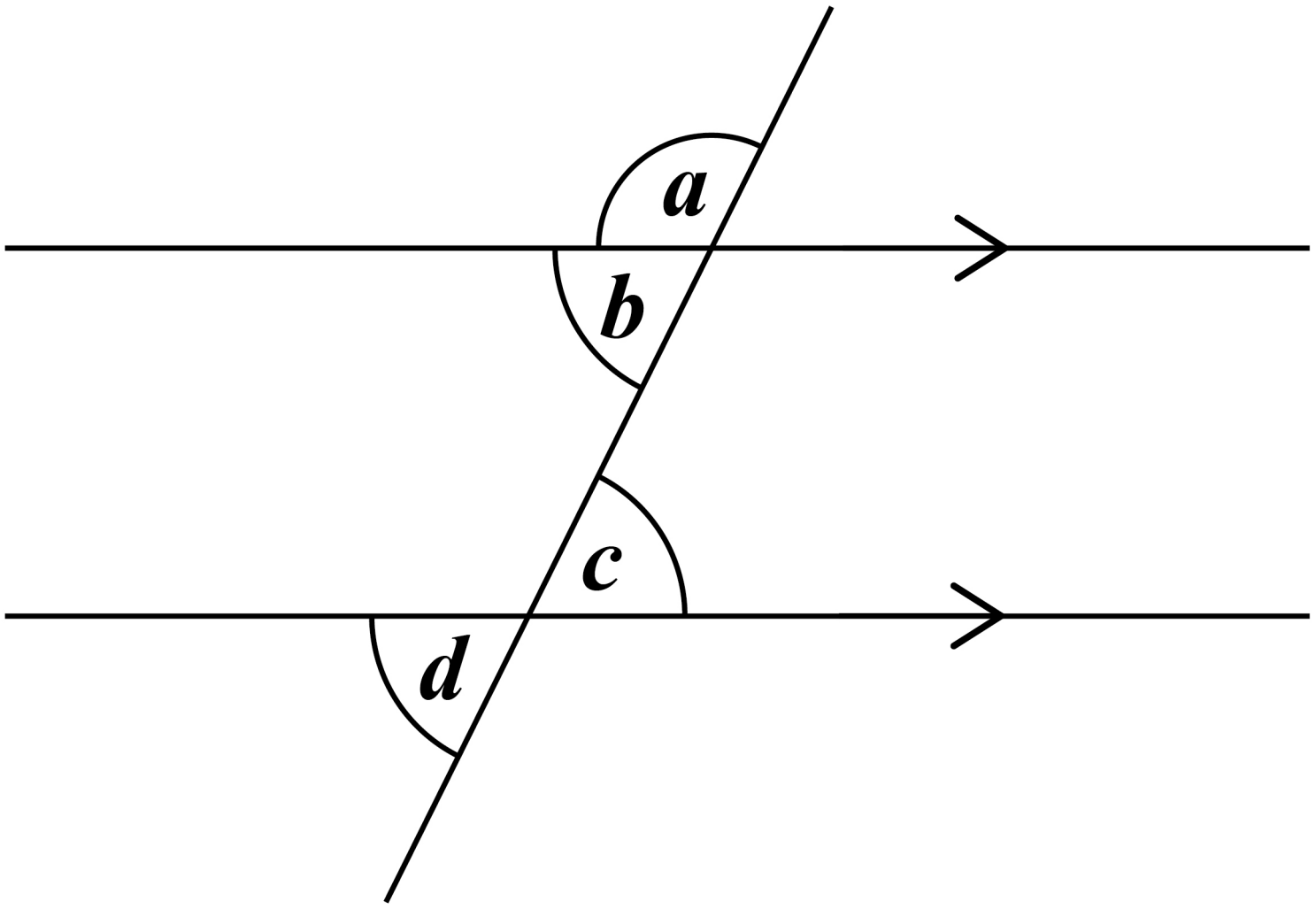
17 (a) Calculate $2^7 \times 5^2$ [1 mark]

Answer _____

17 (b) Calculate $\sqrt[4]{20\,736}$ [1 mark]

Answer _____

18



Circle the pair of alternate angles. [1 mark]

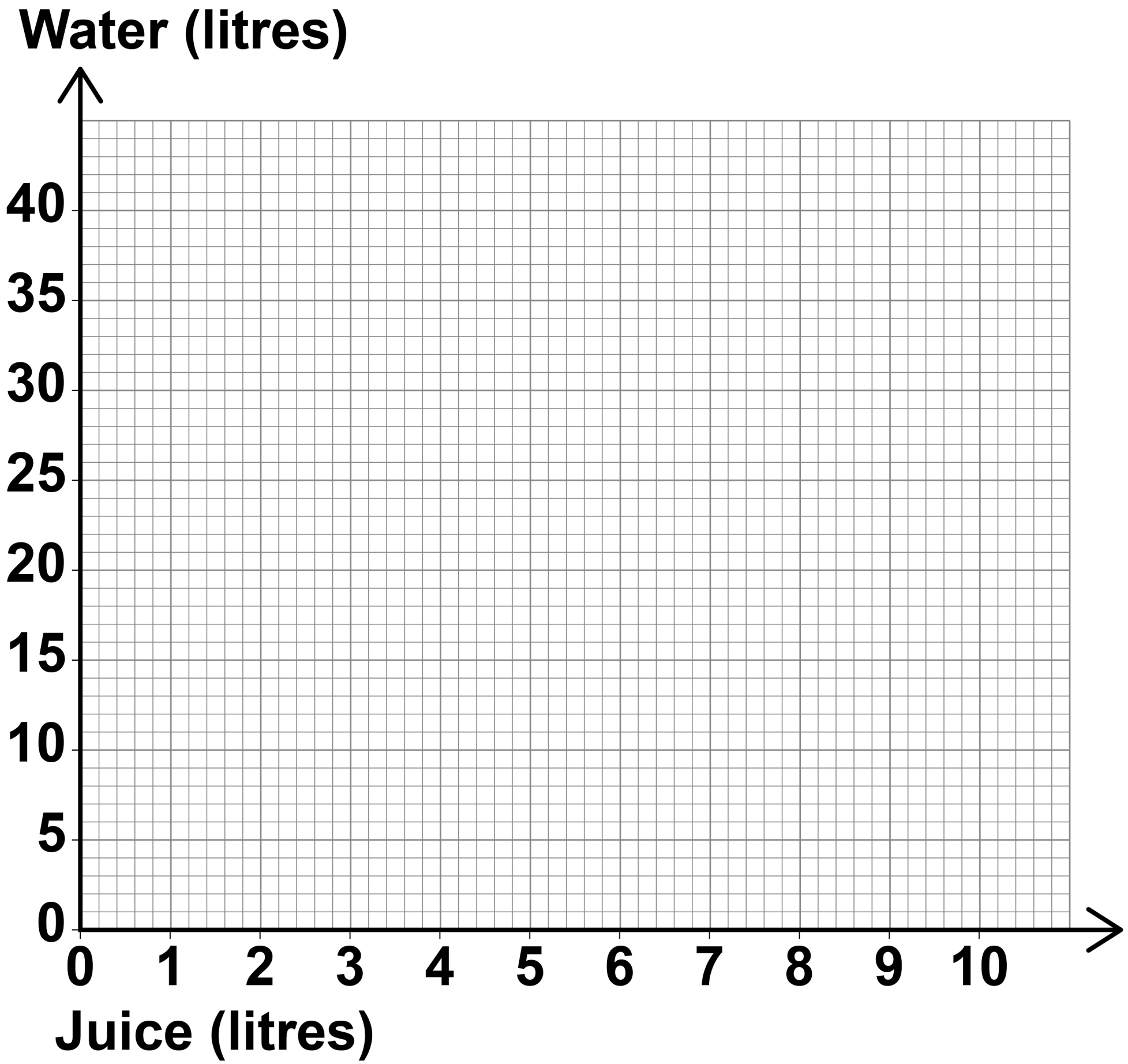
a and *b* *b* and *c* *c* and *d* *a* and *d*

[Turn over]

19 Juice and water are mixed together in the ratio 2 : 7

19 (a) On the opposite page, draw a straight line graph that shows the amounts of juice and water to mix together.

Your graph MUST show up to 10 litres of juice. [2 marks]



19 (b) How much water needs to be mixed with 5 litres of juice? [1 mark]

Answer _____ **litres**

6

20 **Adam and Bianca each throw the same biased coin.**

Here is some information about their throws.

	Number of throws	Number of Heads
Adam	40	14
Bianca	60	20

Bianca says,

“My results give a better estimate of the probability of Heads than Adam’s results.”

Is she correct?

Tick a box.

☐ **Yes**

☐ **No**

Give a reason for your answer.
[1 mark]

_____

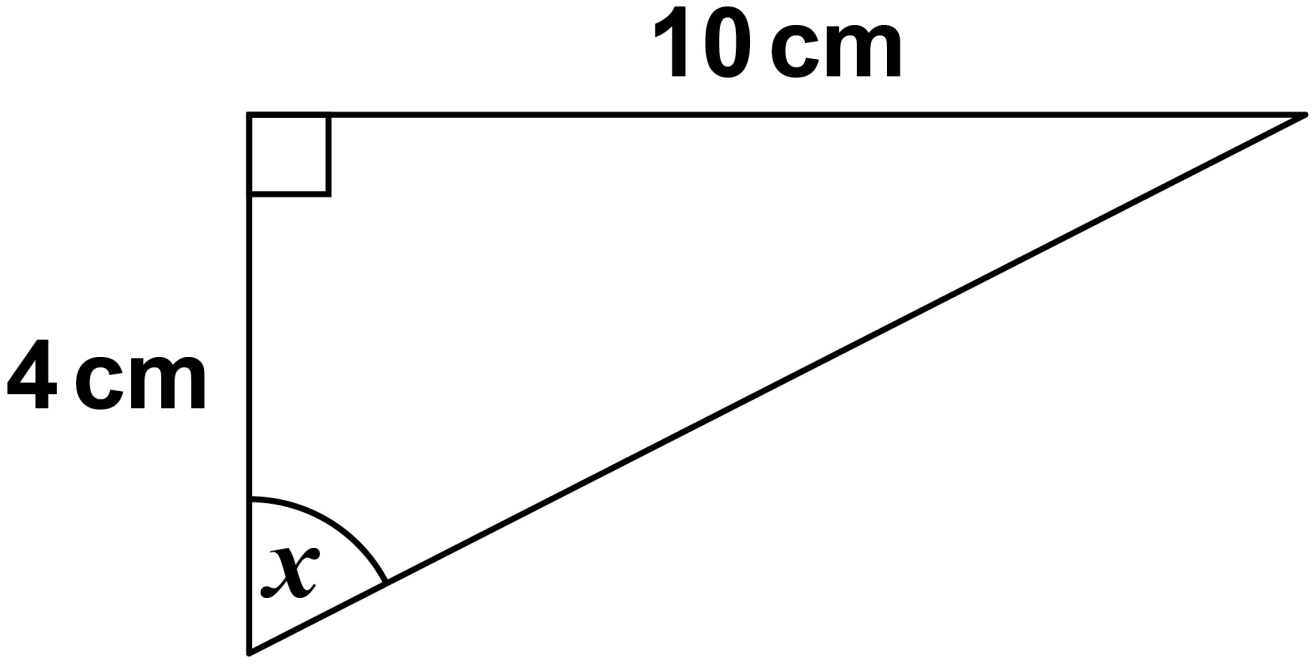
_____

_____

[Turn over]

21 Use trigonometry to work out the size of angle x.

The diagram is not drawn accurately.



[3 marks]

x = _____ °

[Turn over]

4

22 **Laura works in a shop.**

The table shows the number of hours she works on two weekends.

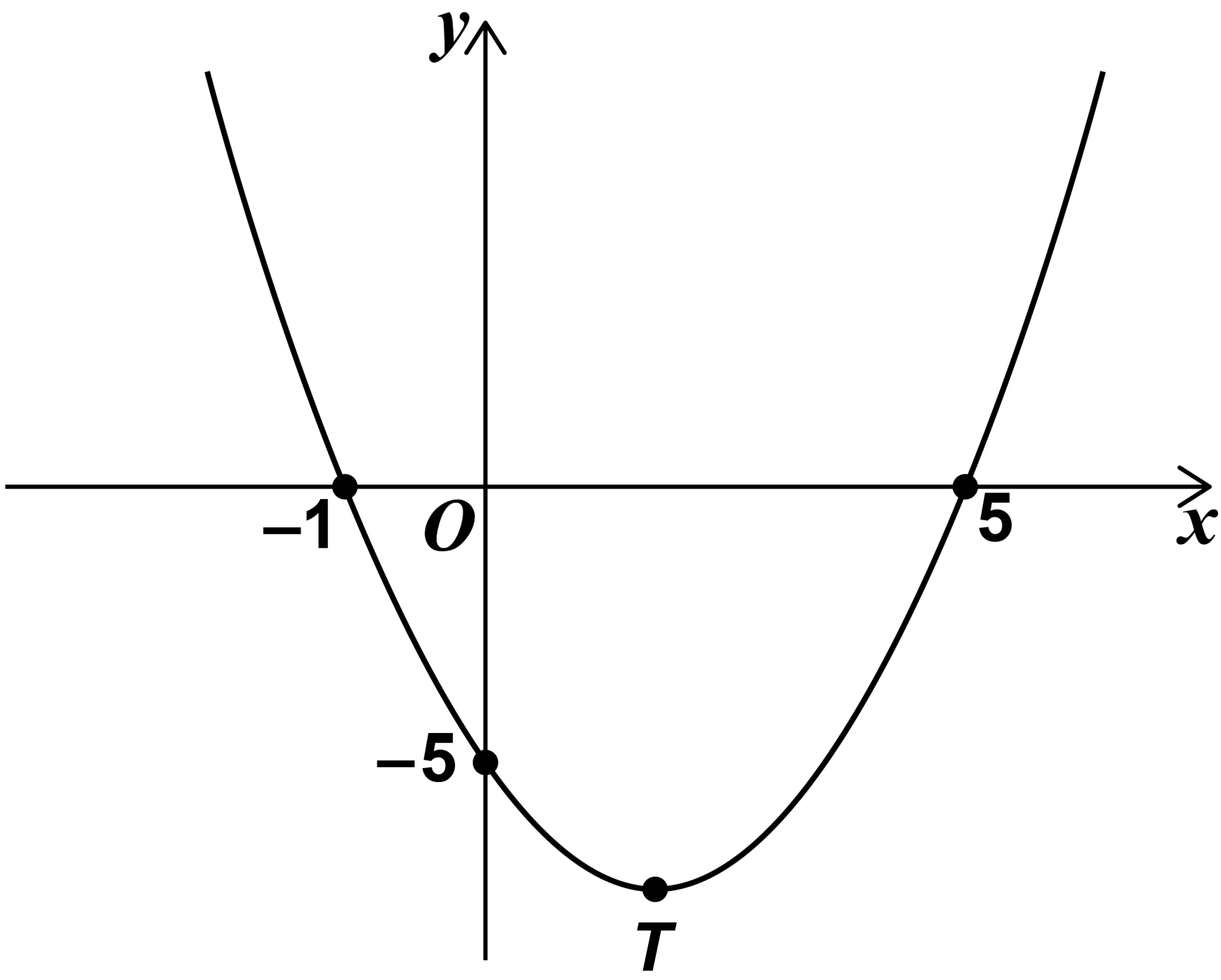
	Saturday	Sunday
Weekend 1	3	2
Weekend 2	$5\frac{1}{2}$	$3\frac{1}{2}$

Work out the percentage increase in her TOTAL hours from Weekend 1 to Weekend 2
[3 marks]

Answer %

[Turn over]

23 Here is a sketch of the curve $y = x^2 - 4x - 5$



23 (a) Write down the TWO roots of $x^2 - 4x - 5 = 0$

[1 mark]

Answer _____ and _____

23 (b) Work out the coordinates of T, the turning point of the curve.
[2 marks]

Answer (_____, _____)

[Turn over]

6

24 A is an ARITHMETIC progression.

Here are the first four terms.

13 16 19 22

G is a GEOMETRIC progression.

Here are the first four terms.

2 4 8 16

nth term of A = 8th term of G

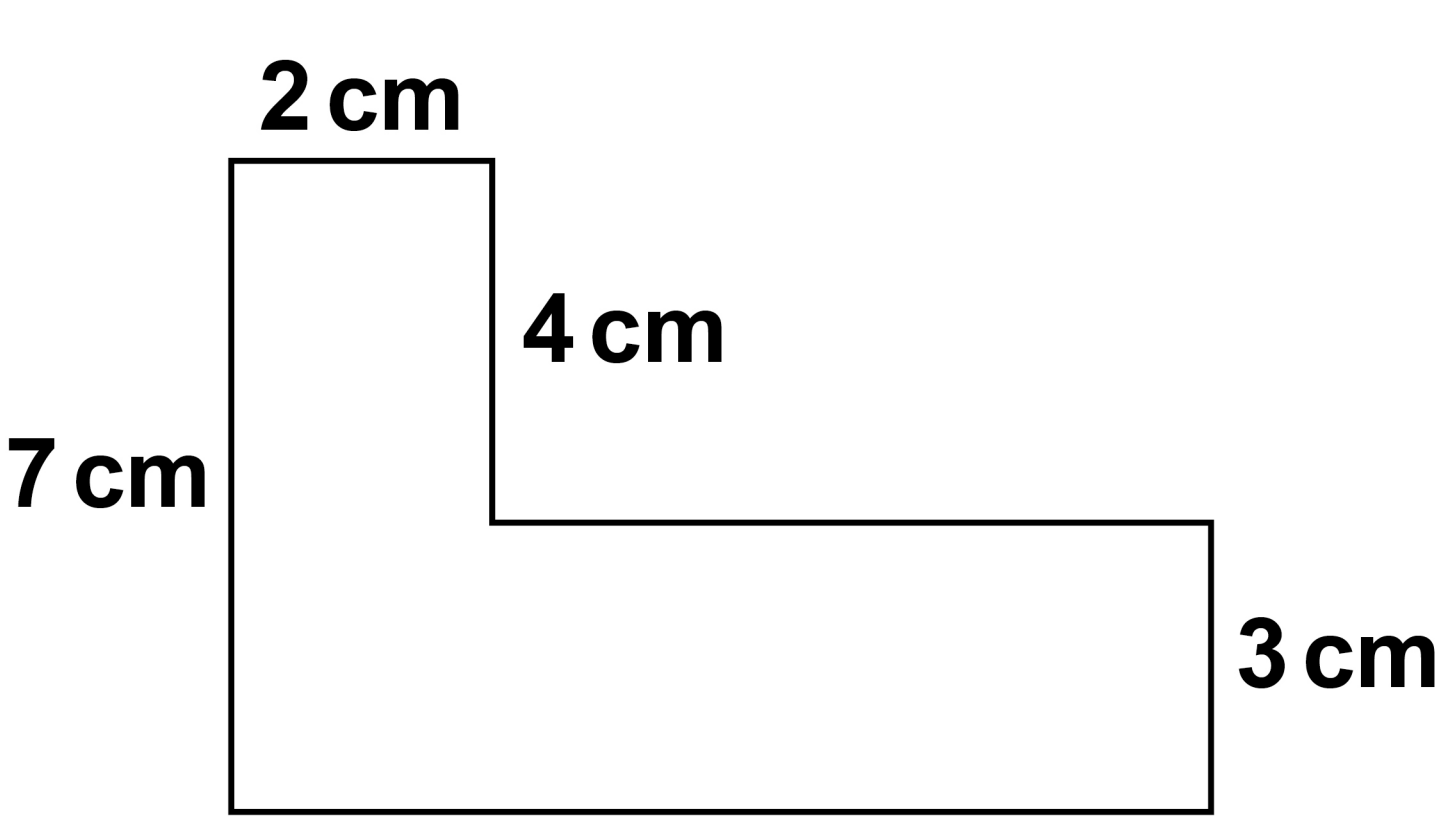
Work out the value of n. [4 marks]

n = _____

[Turn over]

25 **The L-shape is made from rectangles.**

The diagram is not drawn accurately.



The area is 44 cm^2

Work out the perimeter. [3 marks]

Answer _____ cm

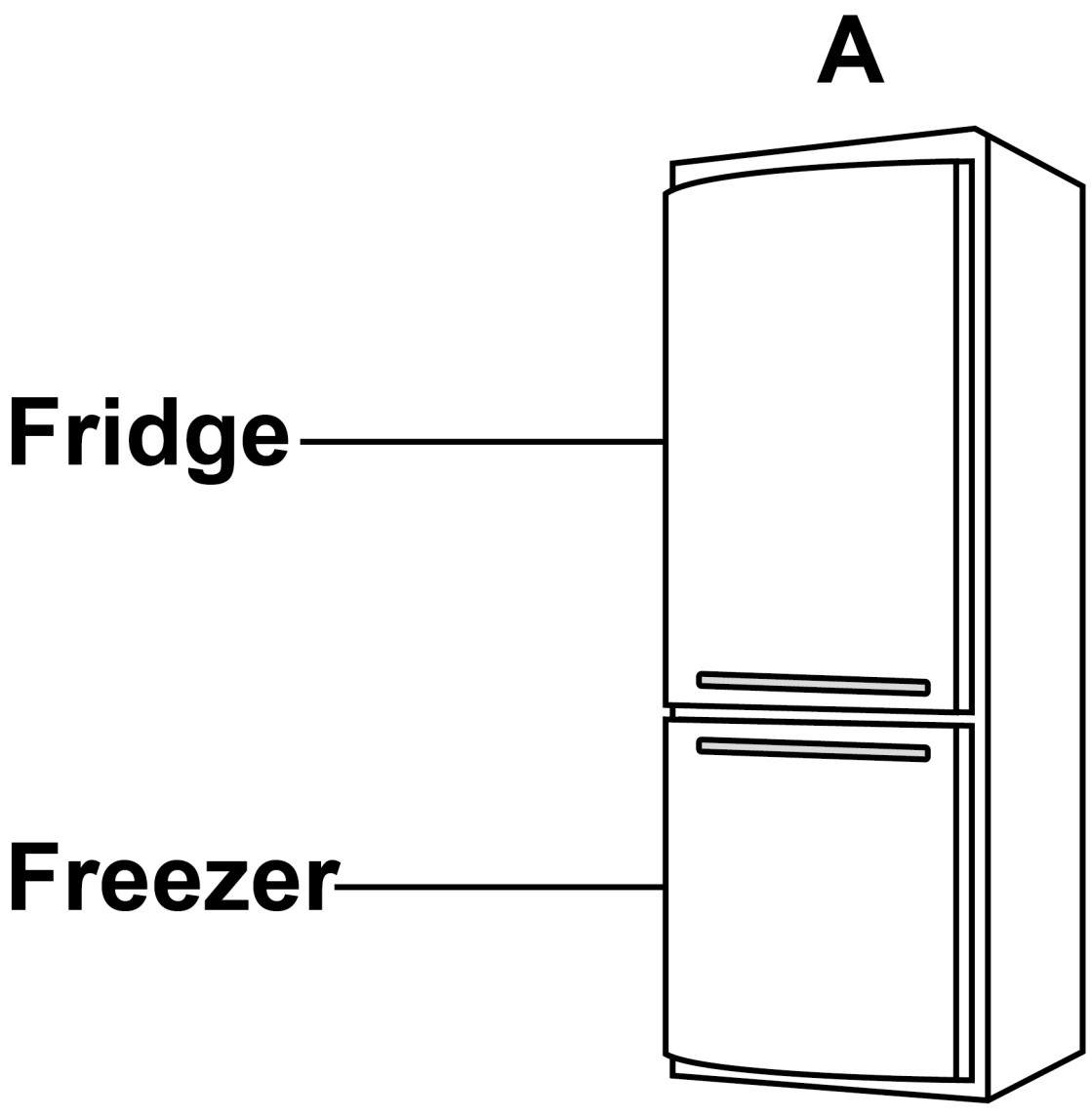
26 Work out $3\begin{pmatrix}1\\6\end{pmatrix} + \begin{pmatrix}2\\5\end{pmatrix}$ [1 mark]

Answer ( )

[Turn over]

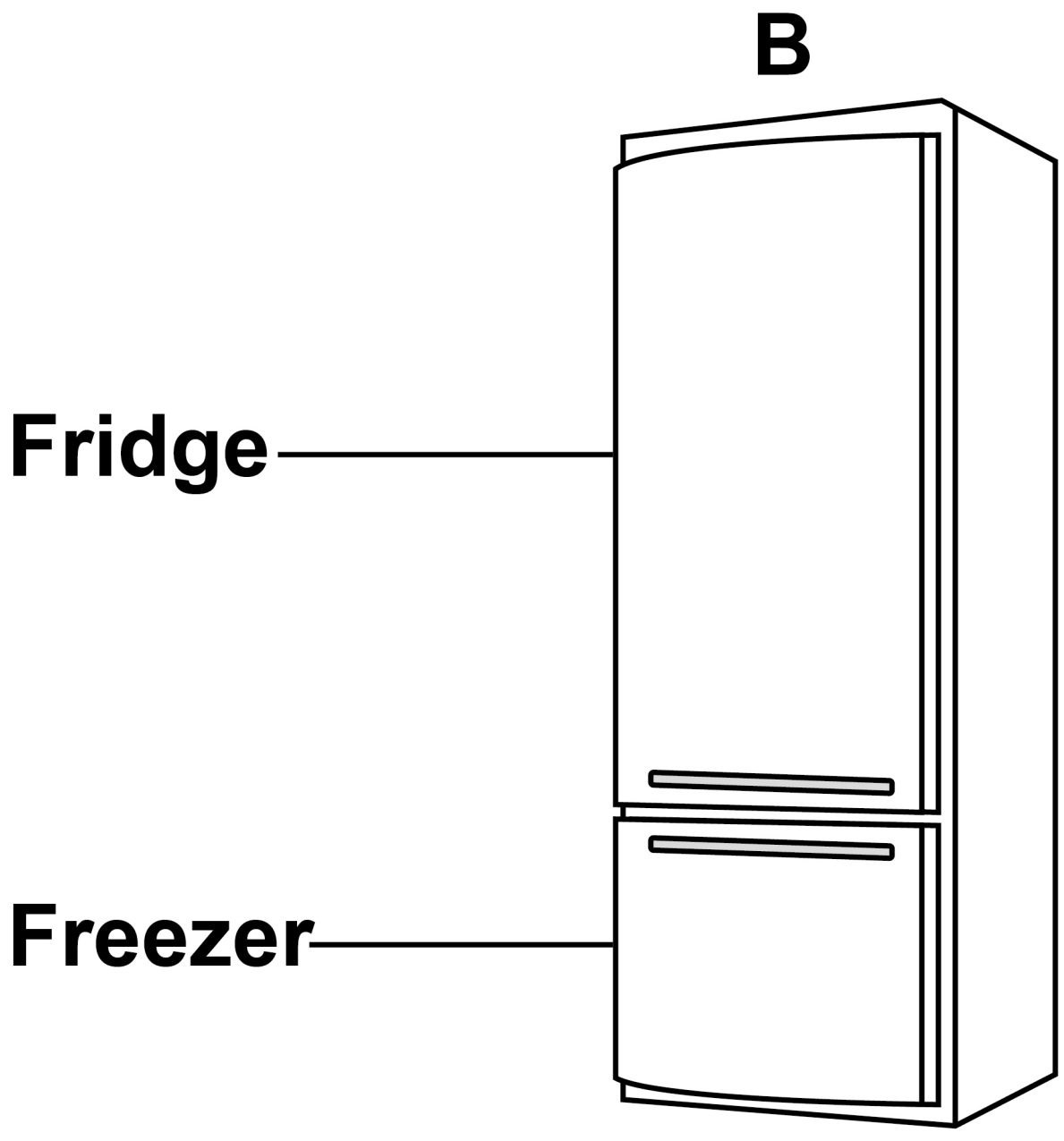
8

27 Information about two fridge-freezers, A and B, is shown.



TOTAL capacity is 330 litres

fridge capacity : freezer capacity = 3 : 2



FRIDGE capacity is 294 litres

fridge capacity : freezer capacity = 7 : 3

[Turn over]

Grace buys one of these fridge-freezers.

She buys the one with the greater FREEZER capacity.

Which one does she buy?

You MUST show your working.
[4 marks]

Answer _____

[Turn over]

4

28 Tom and Adil are the two runners in a 200-metre race.

Tom completes the race in 24 seconds.

Adil completes the race at an average speed of 28.8 kilometres per hour.

Who wins the race?

You MUST show your working.
[3 marks]

Answer _____

[Turn over]

29 **The mass of a baby is 3.6 kilograms to 1 decimal place.**

What is the error interval for the mass in kilograms?

Tick ONE box. [1 mark]

☐ **$3.5 \leqslant \text{mass} \leqslant 3.6$**

☐ **$3.55 \leqslant \text{mass} \leqslant 3.65$**

☐ **$3.5 \leqslant \text{mass} < 3.6$**

☐ **$3.55 \leqslant \text{mass} < 3.65$**

END OF QUESTIONS

4

Additional page, if required.

Write the question numbers in the left-hand margin.

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Write the question numbers in the left-hand margin.

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For Examiner's Use	
Pages	Mark
4–6	
7–9	
10–13	
14–17	
18–21	
22–24	
25–29	
30–33	
34–37	
38–41	
42–45	
46–49	
50–53	
54–56	
TOTAL	