



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.

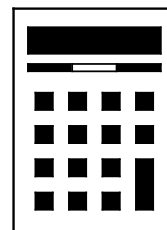
[Turn over]



JUN 22 83003F01

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]

$$42c$$

$$16c$$

$$8c$$

$$6c$$

[Turn over]



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 | |

| |
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| 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

[Turn over]



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]**

Answer _____

[Turn over]

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| 5 |



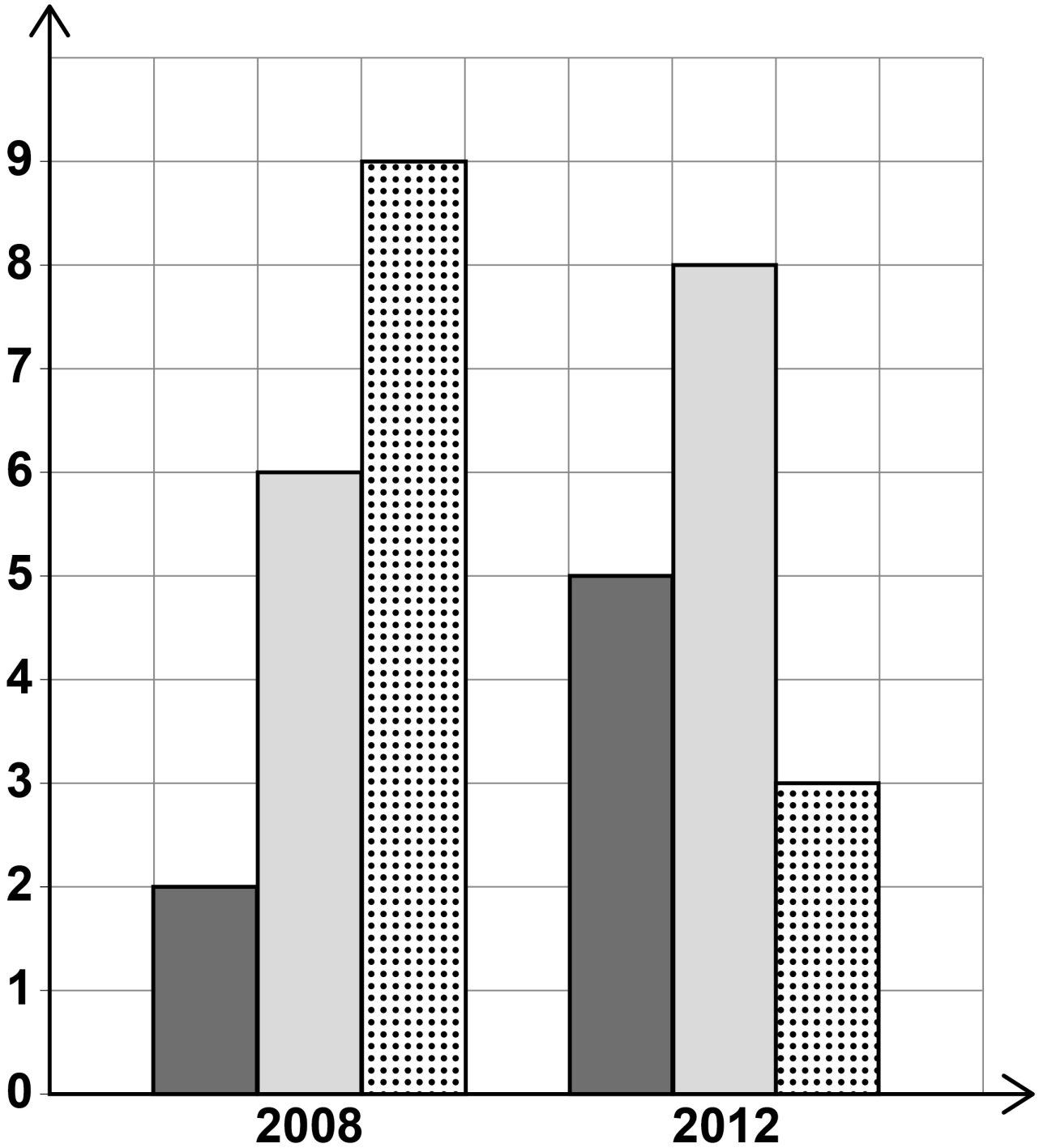
- 7** The bar chart, on the opposite page, shows the number of medals won by a country at events in 2008 and 2012
- 7 (a)** Complete this statement about the medals won by the country in 2008 [1 mark]

number of Silver medals =

_____ × number of Gold medals



Number of medals



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]

[Turn over]

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 \div 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]**



15

Answer _____ ml

[Turn over]





9 Some students were asked about their daily exercise.

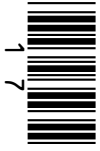
9 (a) 12 MORE students answered Yes than answered No.

**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]

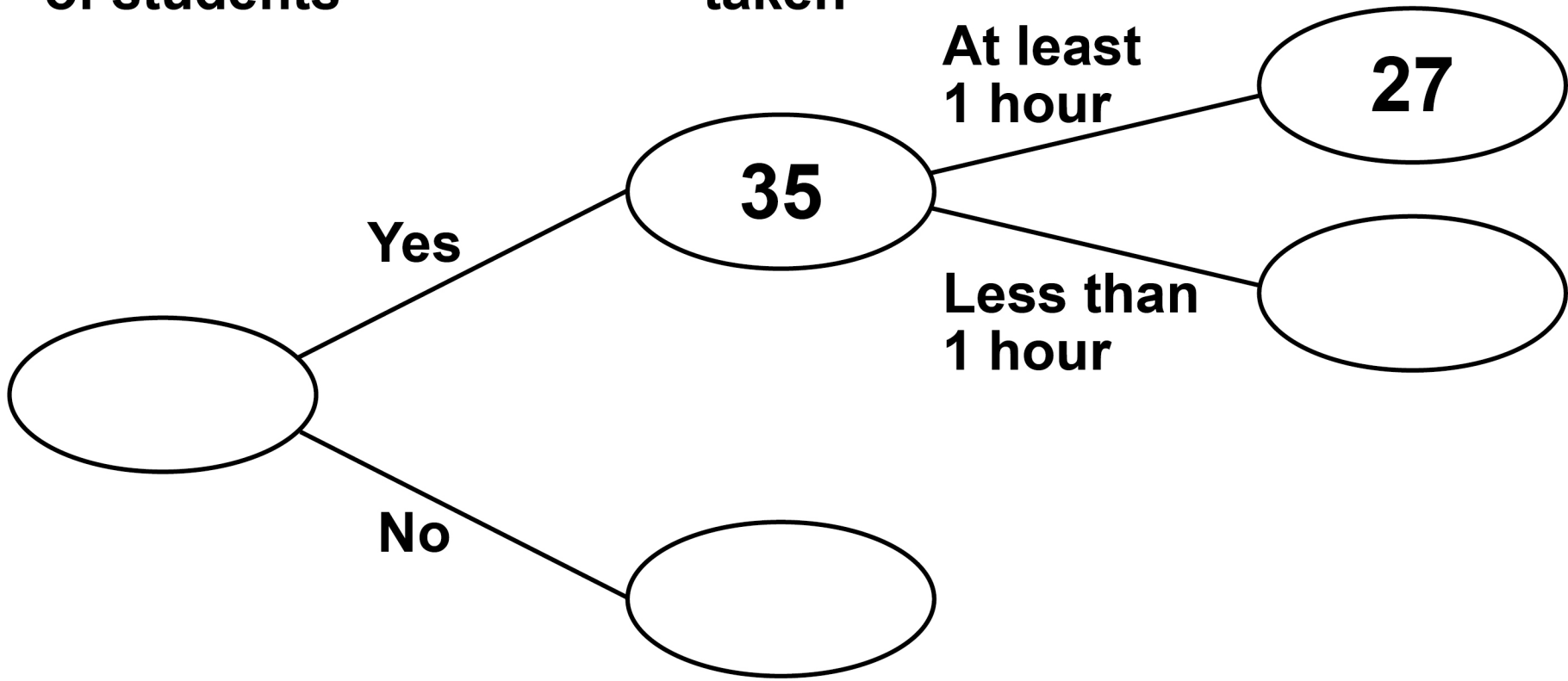
Answer _____



**Total number
of students**

**Exercise
taken**

Time exercising

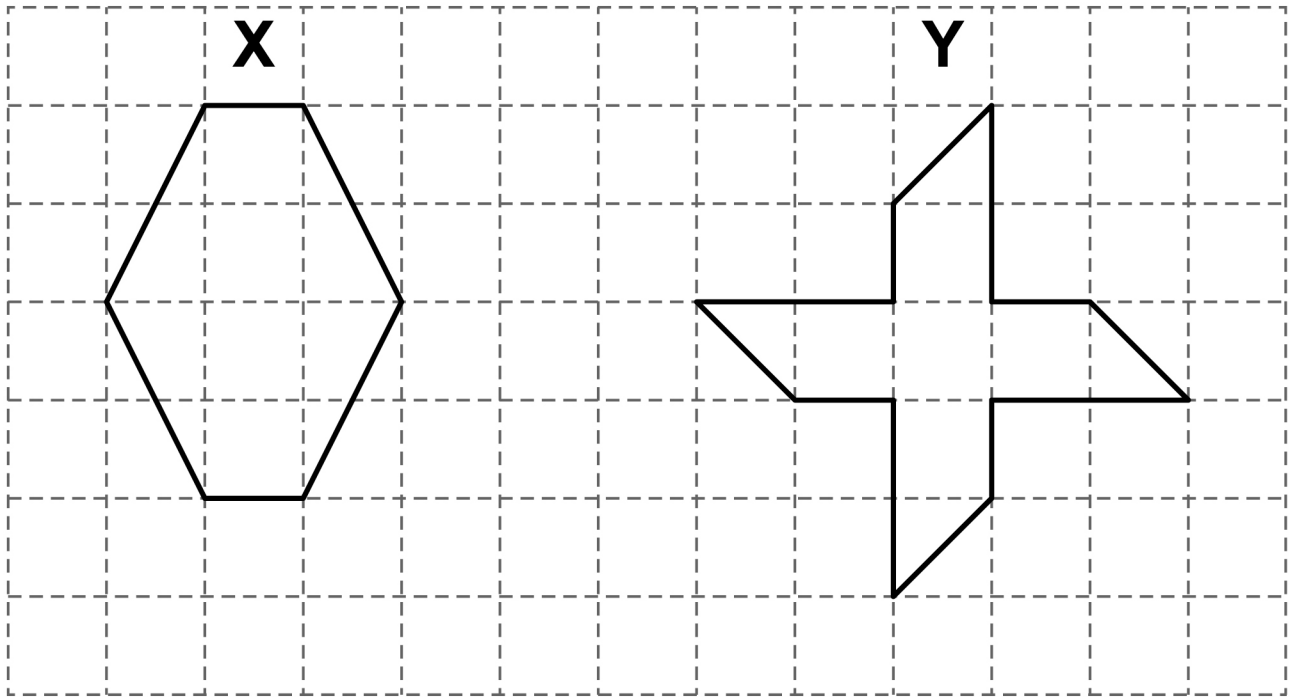


17

[Turn over]

8

- 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]

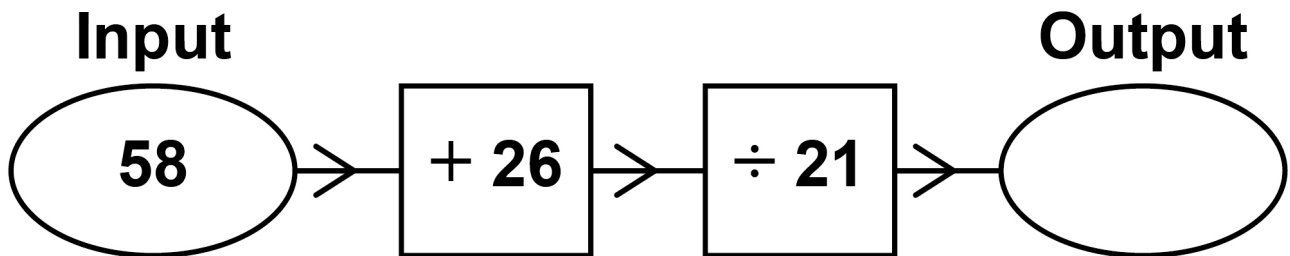
The number of lines of symmetry of shape X is

The order of rotational symmetry of shape Y is

[Turn over]



11 (a) Here is a number machine.

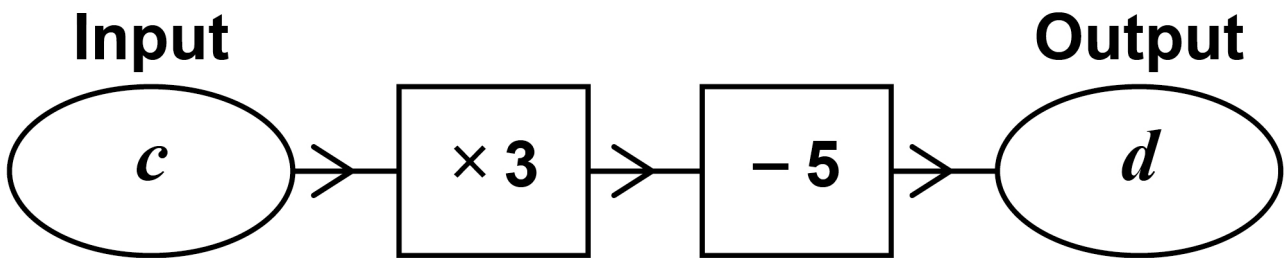


Work out the output. [1 mark]

Answer _____



11 (b) Here is a different number machine.



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

Answer _____

[Turn over]

| |
|---|
| |
| 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]



$$b = \underline{\hspace{10cm}}$$

12 (c) Simplify $\frac{6w + 10}{2}$

Circle your answer. [1 mark]

$6w + 8$

$3w + 10$

$6w + 5$

$3w + 5$

[Turn over]



- 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. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| In total there are 31 discs. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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| 8 |
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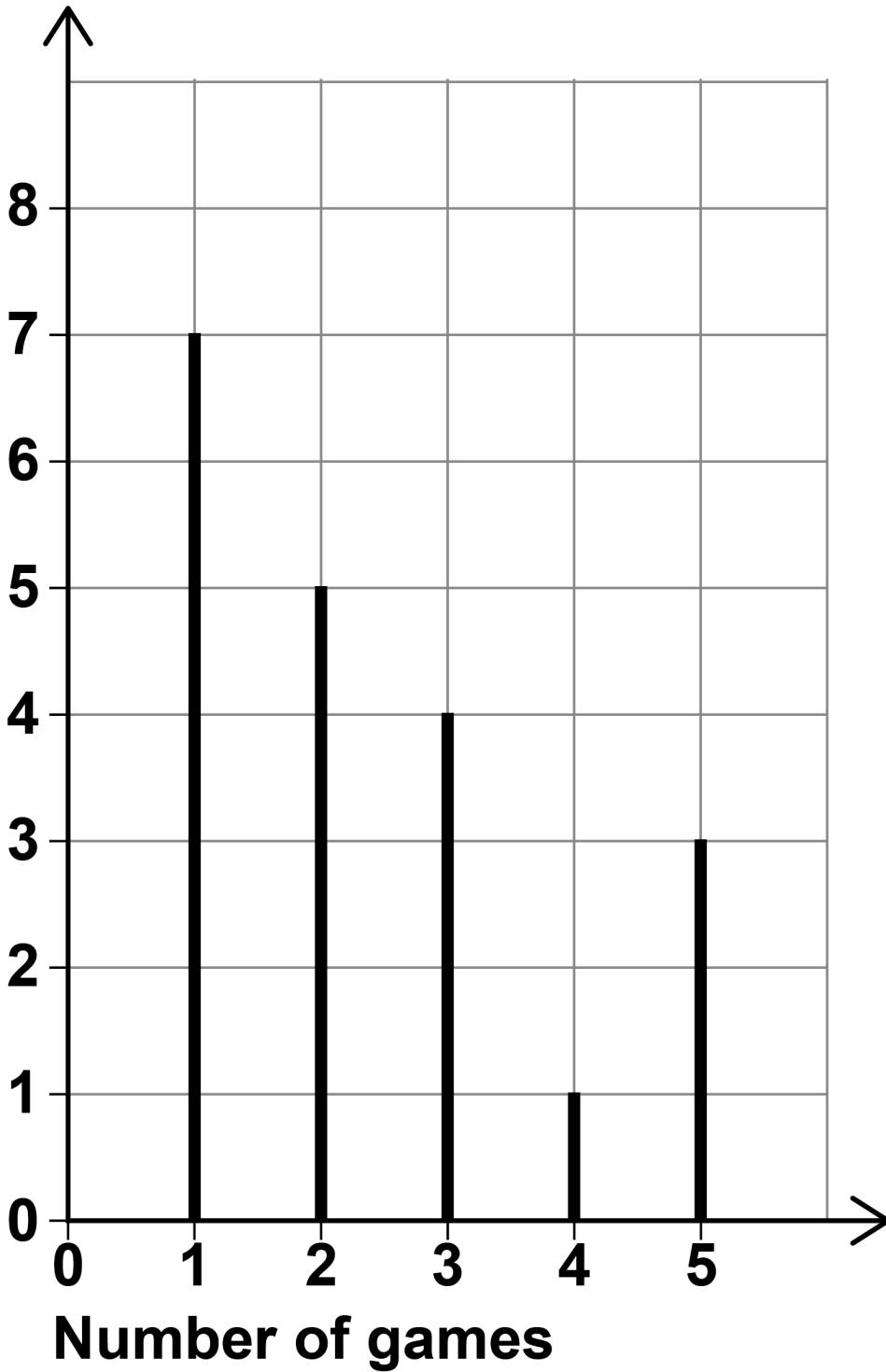
14 **20 students are asked how many video games they played last month.**

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

[Turn over]



Number of students



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

Answer _____

[Turn over]



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

Give your answer as a decimal.
[3 marks]

Answer _____

[Turn over]

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| <hr/> 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 _____

[Turn over]

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]

| |
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| 6 |



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

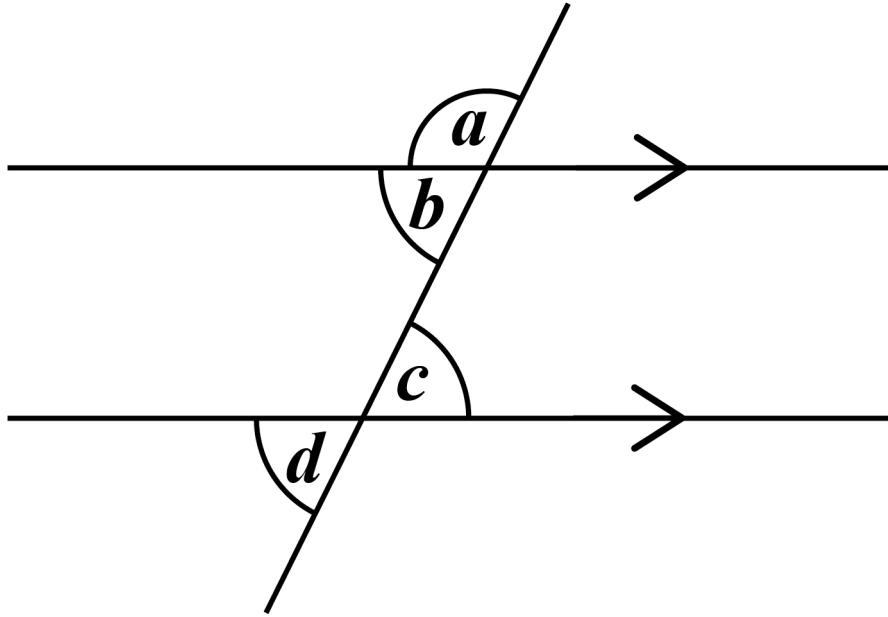
Answer _____

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]

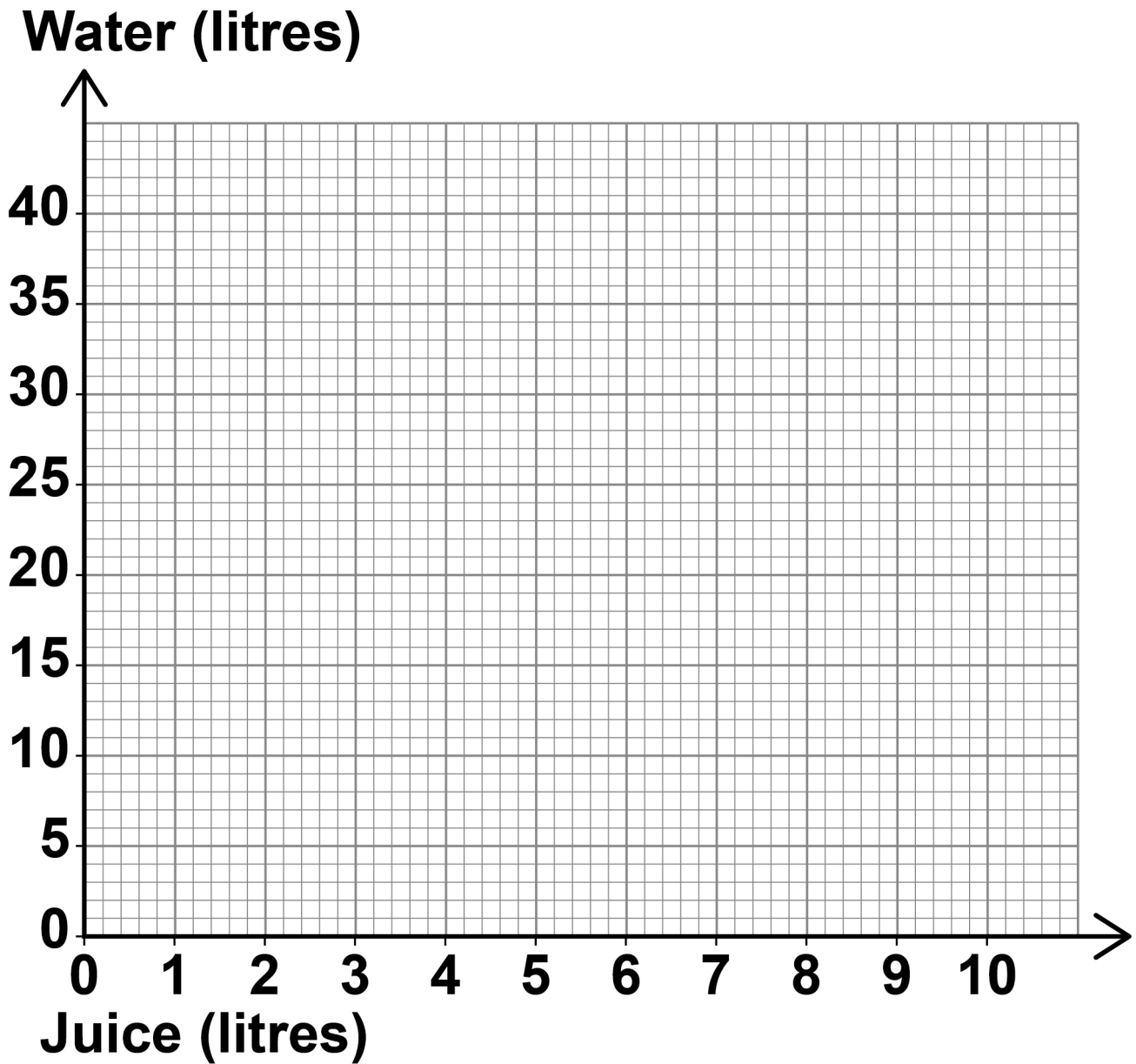


19 Juice and water are mixed together in the ratio 2 : 7

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

[Turn over]



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

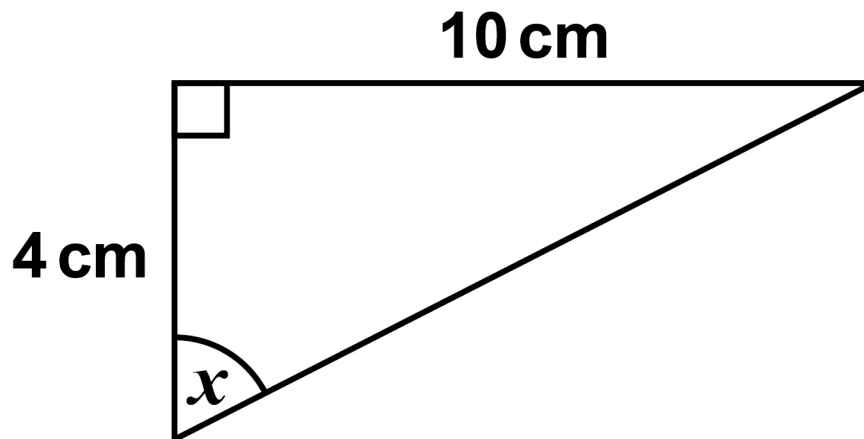
No

**Give a reason for your answer.
[1 mark]**

[Turn over]

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

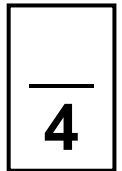
The diagram is not drawn accurately.



[3 marks]

$$x = \underline{\hspace{10cm}}^{\circ}$$

[Turn over]



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]

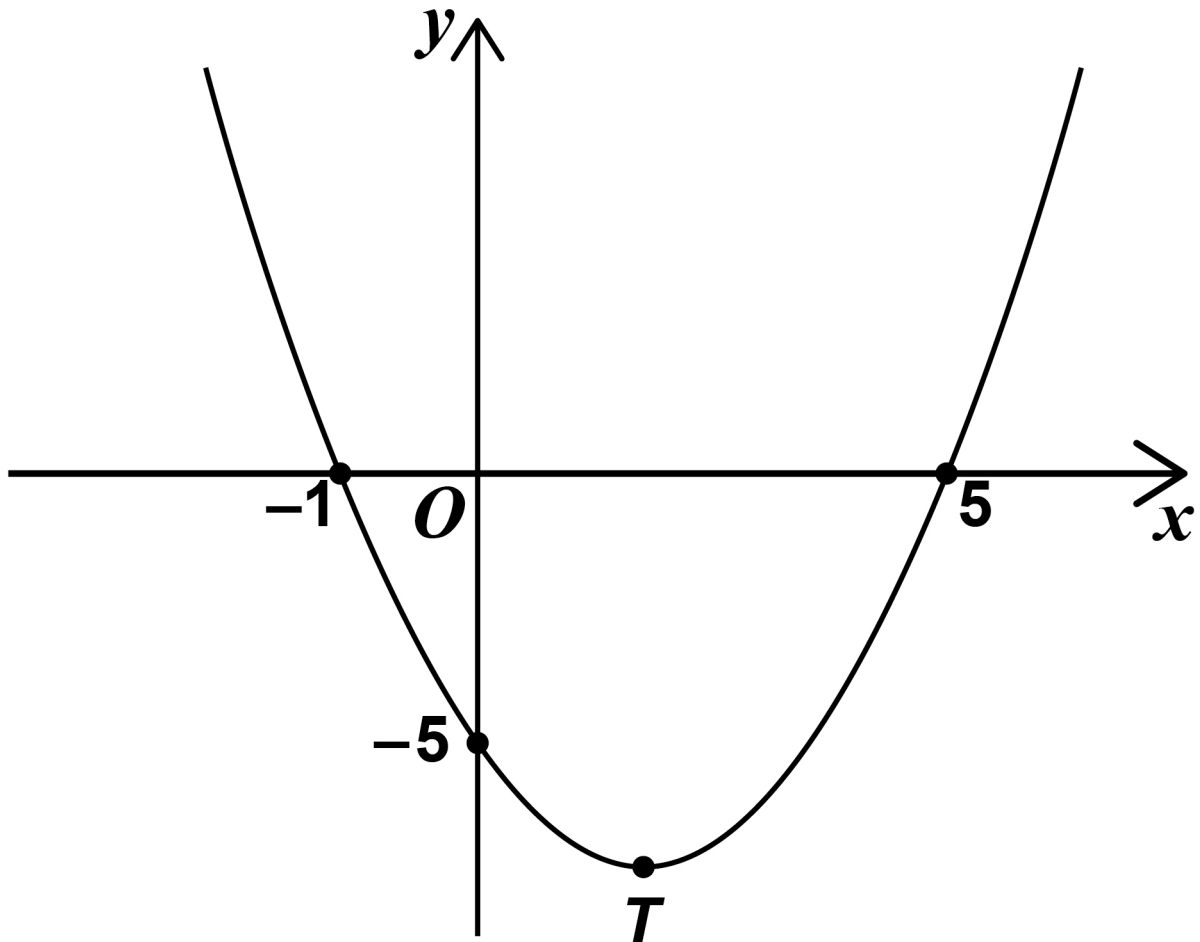


Answer _____ %

[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]

| |
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| 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

| |
|----------------------------------|
| n th term of A = 8th term of G |
|----------------------------------|

Work out the value of n . [4 marks]

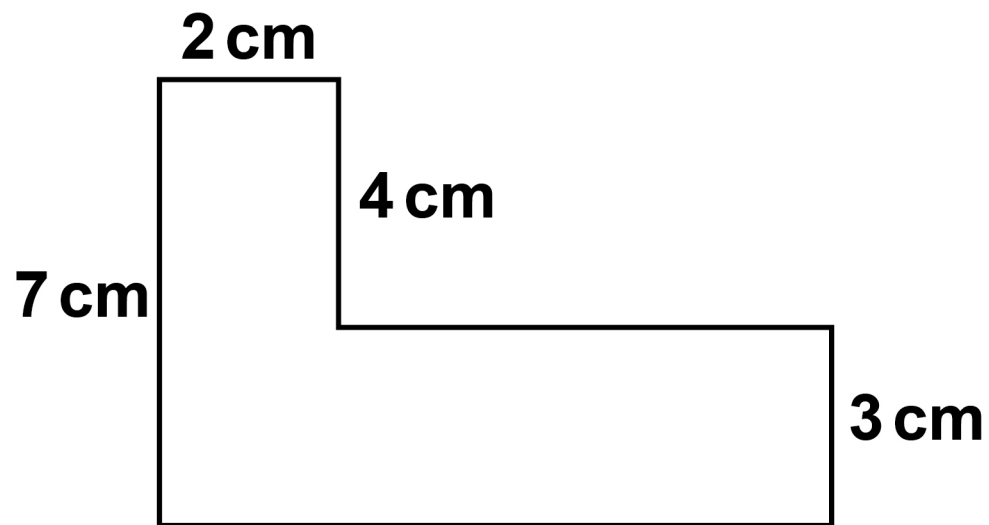
n = _____

[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 $3\left(\frac{1}{6}\right) + \left(\frac{2}{5}\right)$ [1 mark]

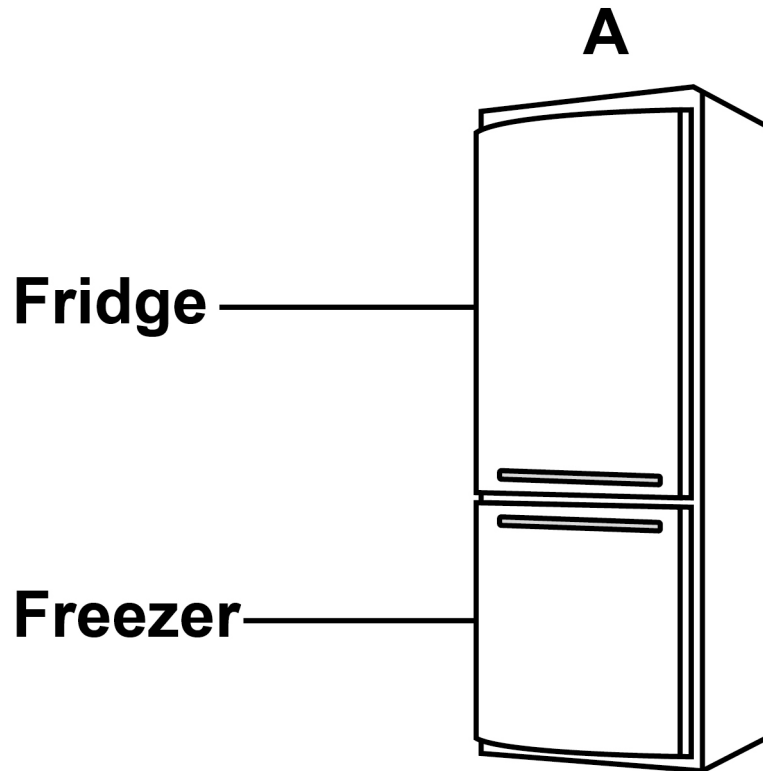
Answer ()

[Turn over]

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

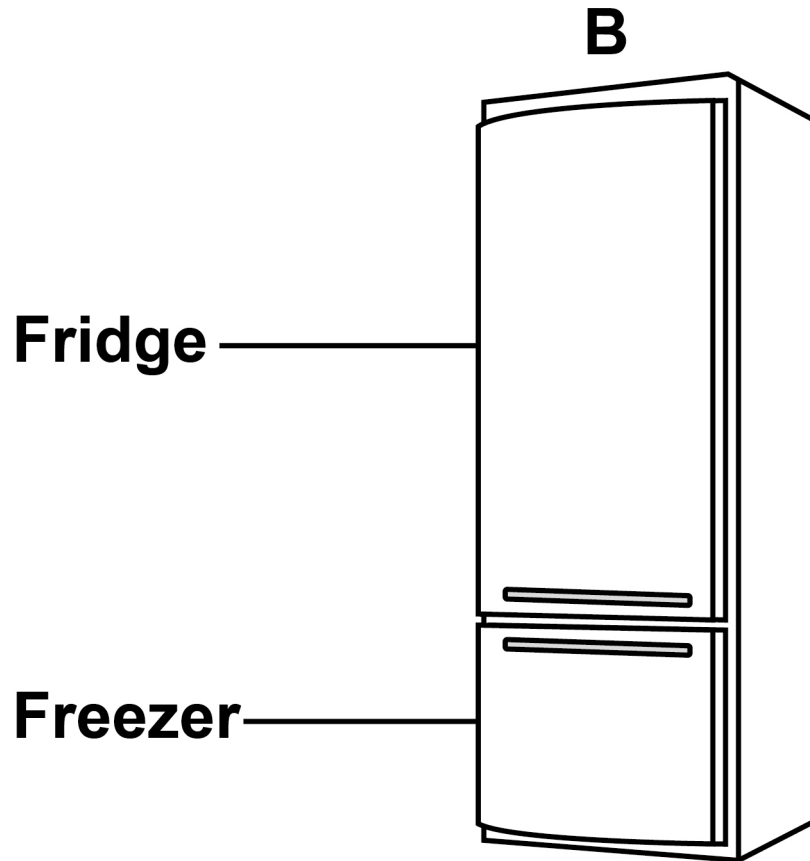


TOTAL capacity is 330 litres

**fridge capacity : freezer capacity =
3 : 2**



51



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]

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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]

$$3.5 \leq \text{mass} \leq 3.6$$

$$3.55 \leq \text{mass} \leq 3.65$$

$$3.5 \leq \text{mass} < 3.6$$

$$3.55 \leq \text{mass} < 3.65$$

END OF QUESTIONS

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Additional page, if required.

Write the question numbers in the left-hand margin.

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Additional page, if required.

Write the question numbers in the left-hand margin.



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| Pages | Mark |
| 4–6 | |
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| 54–56 | |
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