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

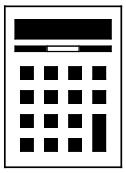
Time allowed: 1 hour 30 minutes

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

[Turn over]

J U N 2 2 8 3 0 0 3 F 0 1

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.

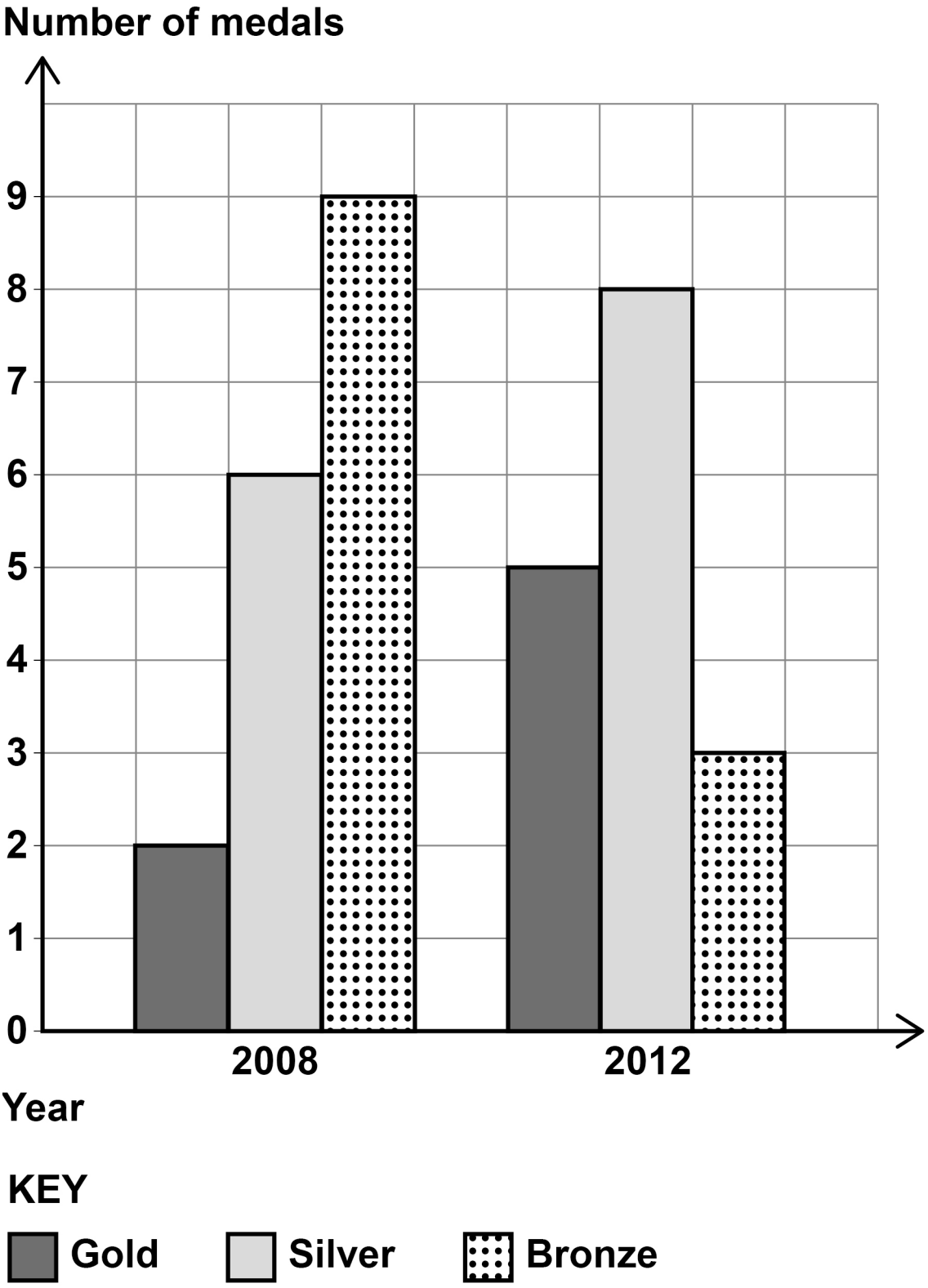
He buys 8 rulers.

The total cost is £10

How many pens does he buy? [3 marks]

Answer _____

7 The bar chart 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

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

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[Turn over]

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]

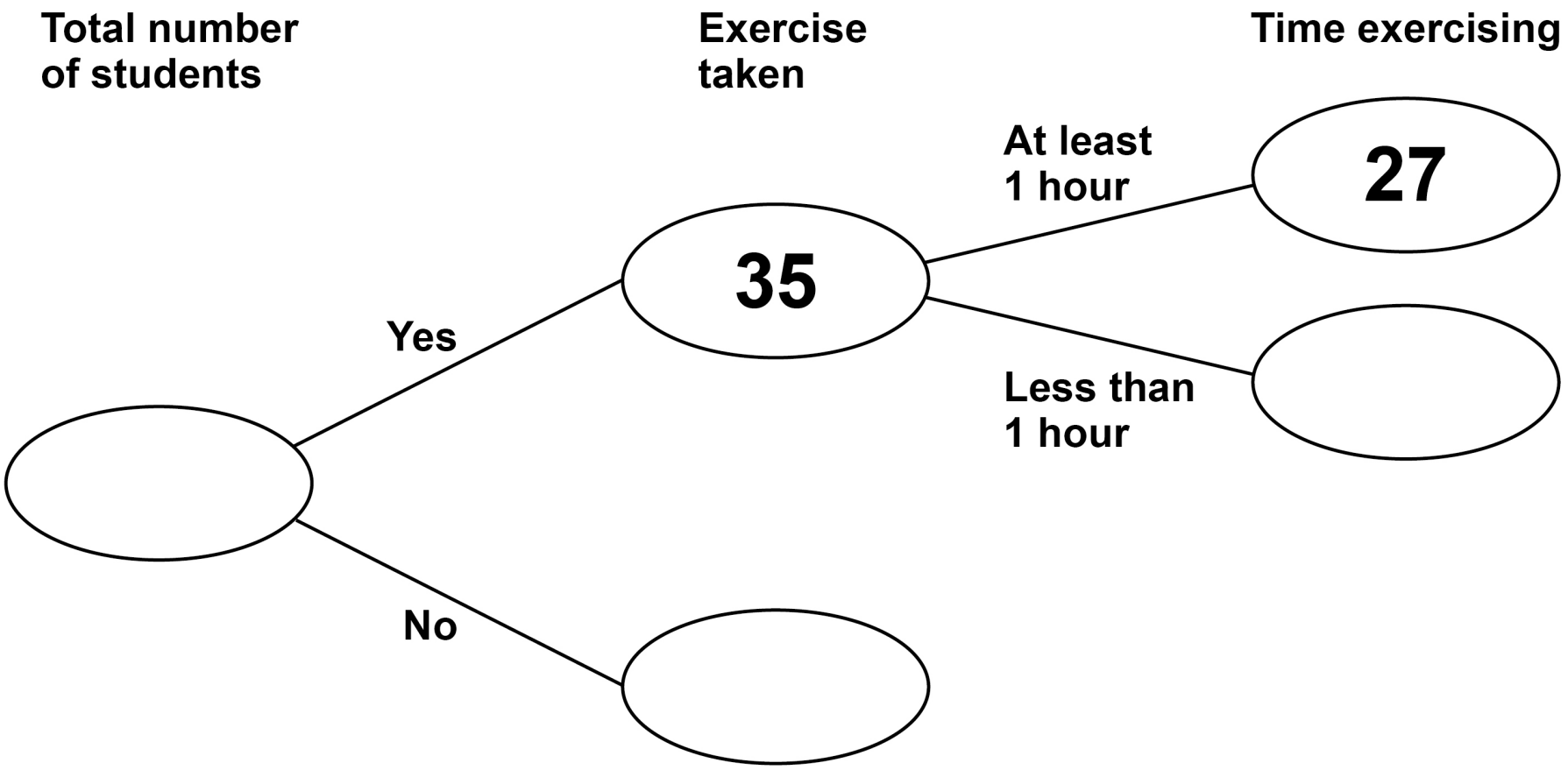
Answer _____ ml

[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. [3 marks]



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

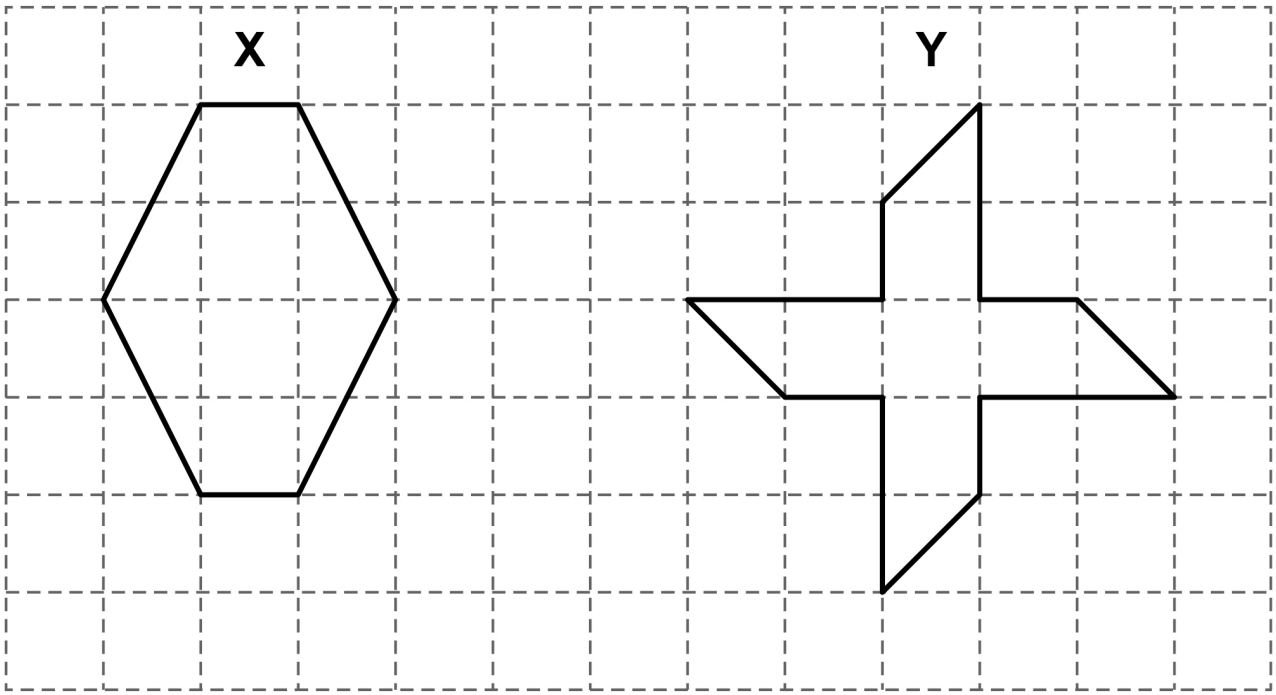
What is the probability that they exercise for at least 1 hour? [1 mark]

Answer _____

[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**

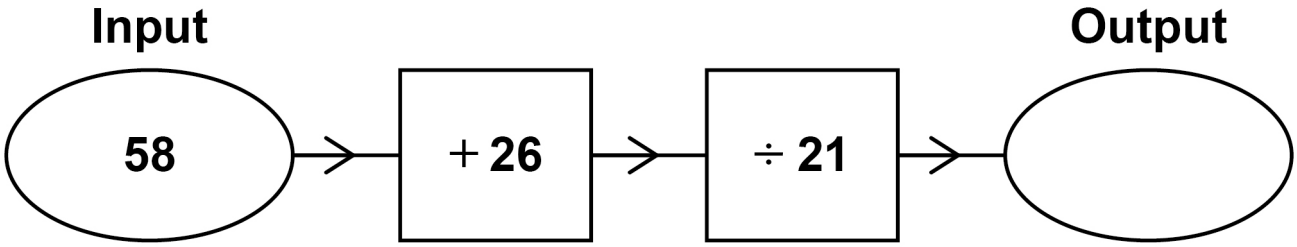
10 (b) **Give a reason why shape Y is NOT a regular polygon. [1 mark]**

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

11(a) Here is a number machine.



Work out the output. [1 mark]

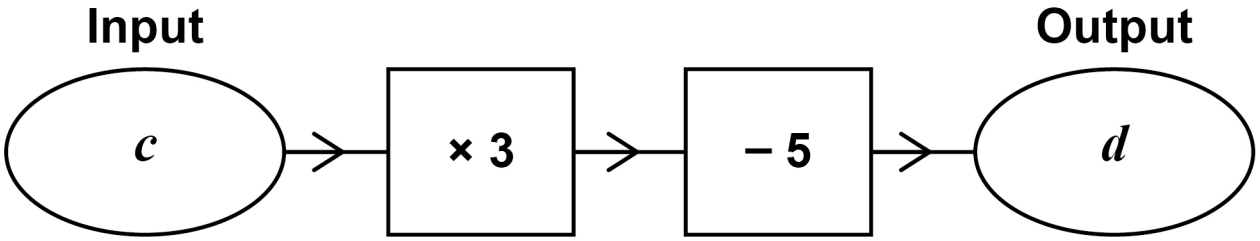
_____

_____

_____

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 = _____

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

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]

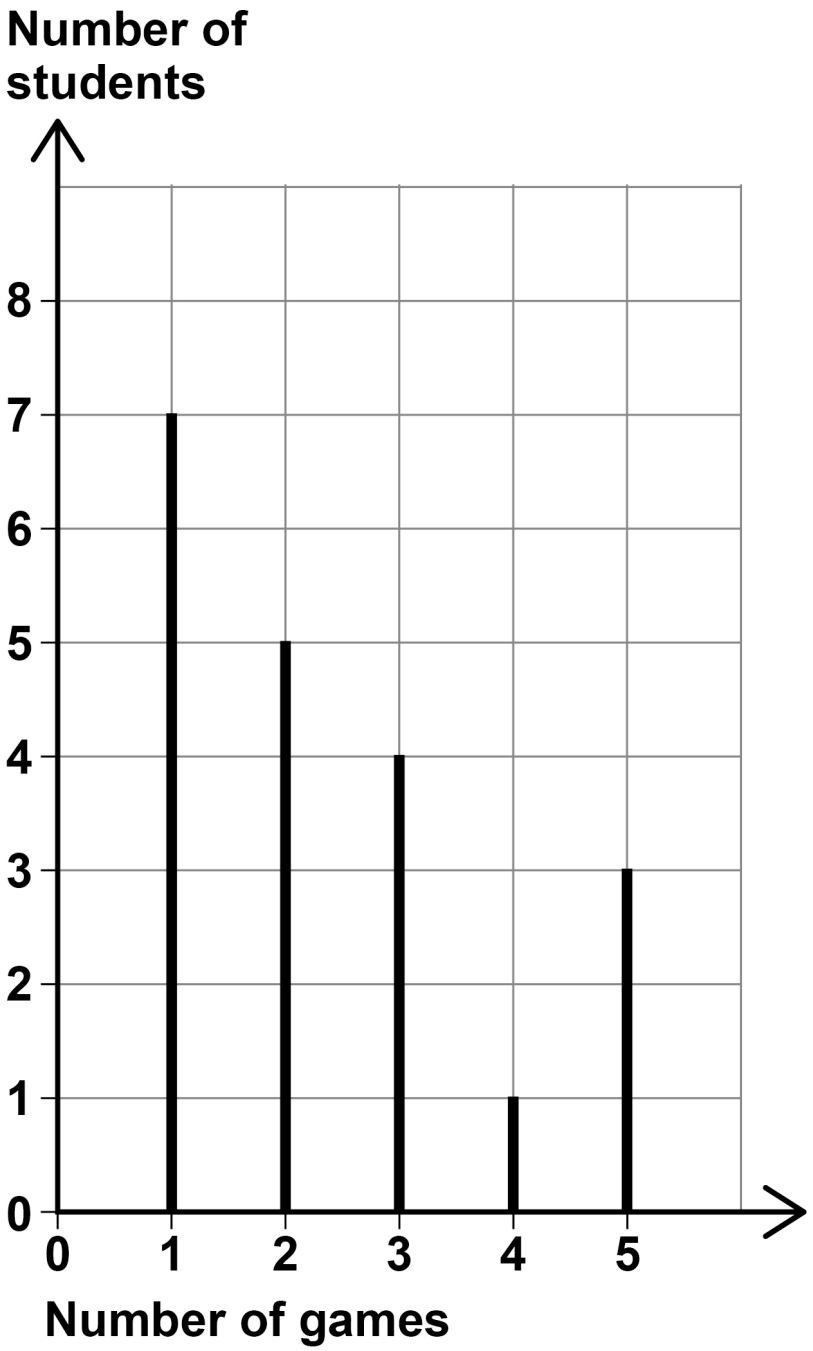
	True	False	Cannot tell
There are more green discs than blue discs.	☐	☐	☐
In total there are 31 discs.	☐	☐	☐

[Turn over]

8

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

The chart shows information about the results.



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

Answer _____

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

Give your answer as a decimal. [3 marks]

Answer _____

[Turn over]

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]

6

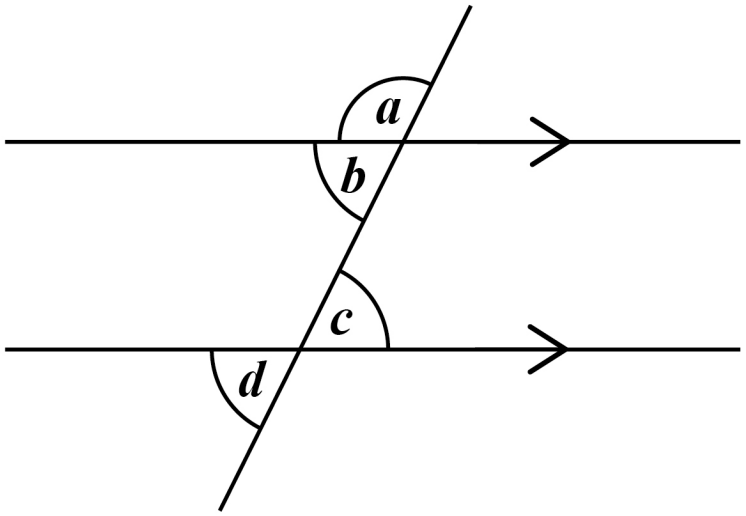
17 (a) Calculate $2^7 \times 5^2$ [1 mark]

Answer _____

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

Answer _____

18



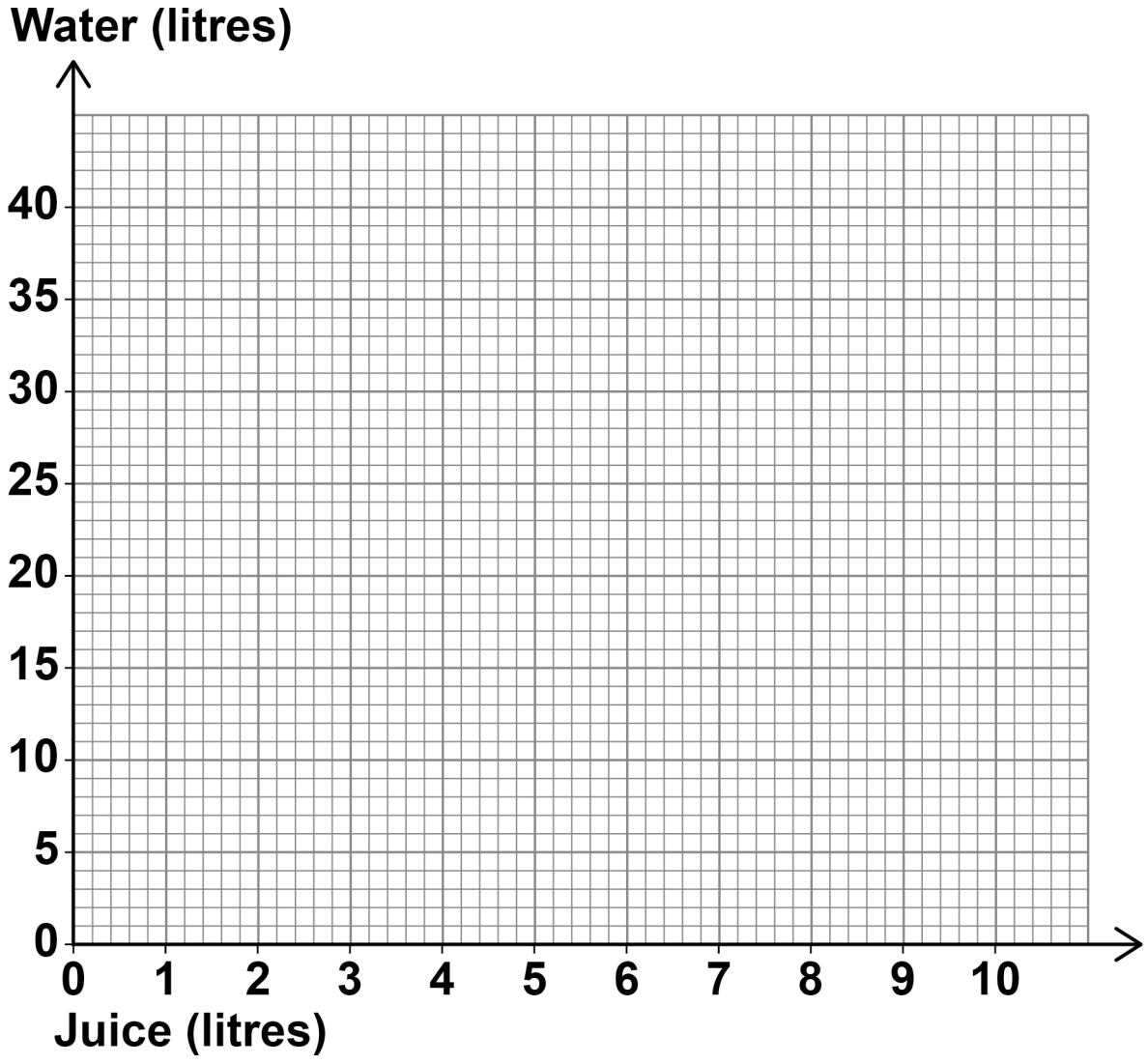
Circle the pair of alternate angles. [1 mark]

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

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

19 (a) 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]

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.

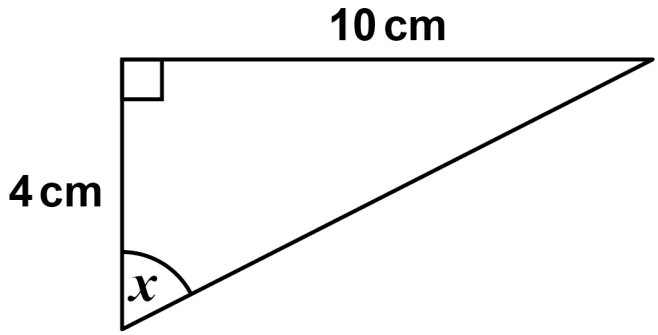
☐ **Yes**

☐ **No**

Give a reason for your answer. [1 mark]

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 _____ **%**

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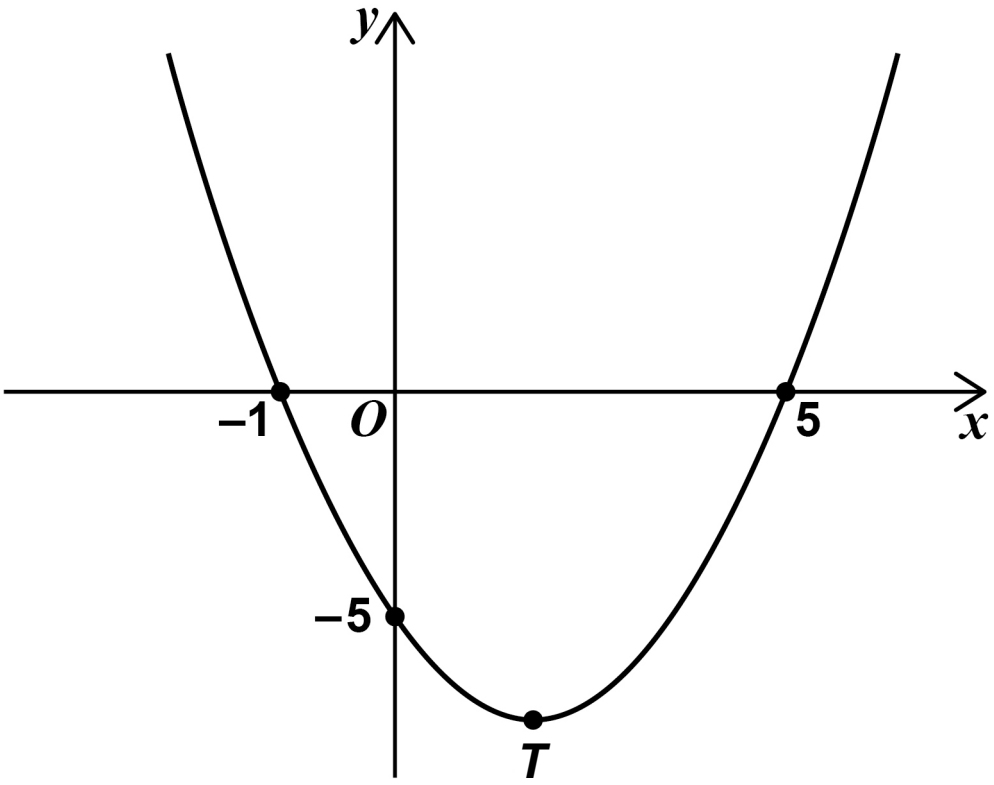
[Turn over]

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

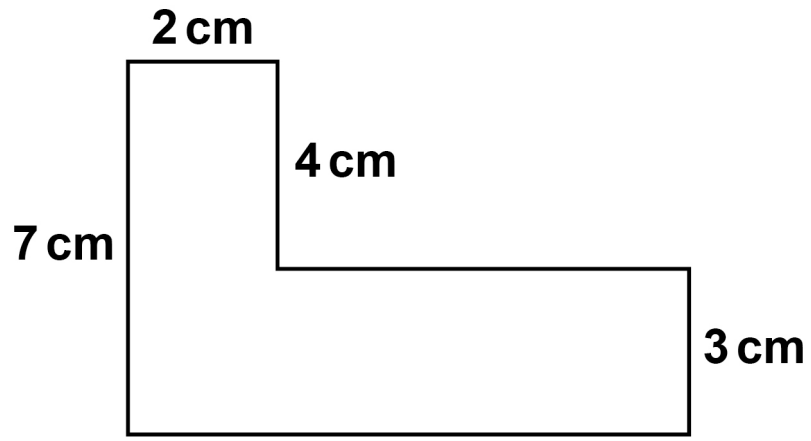
Work out the value of n. [4 marks]

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]**

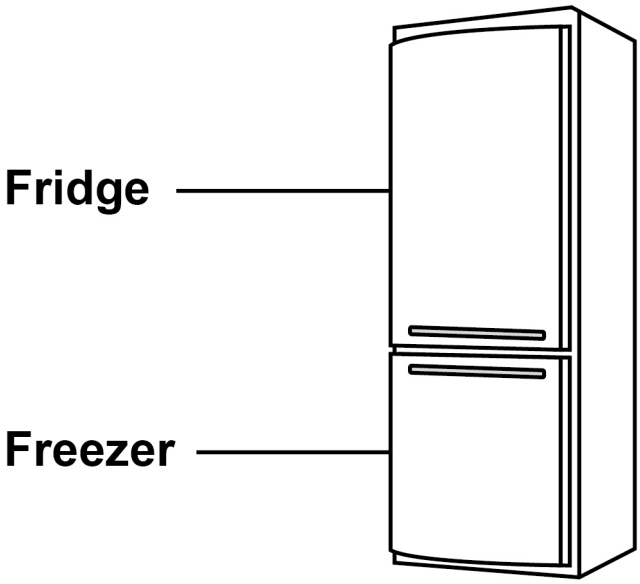
Answer ( )

[Turn over]

8

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

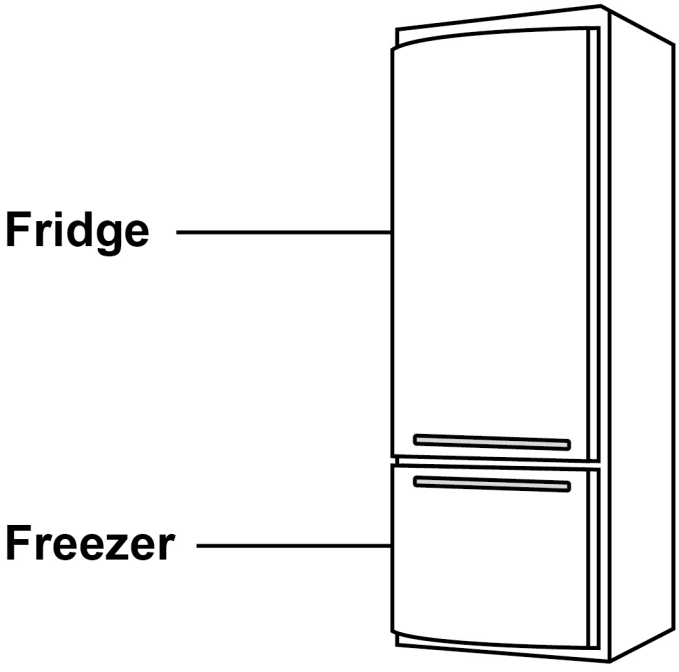
A



TOTAL capacity is 330 litres

fridge capacity : freezer capacity = 3 : 2

B



FRIDGE capacity is 294 litres

fridge capacity : freezer capacity = 7 : 3

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 _____

4

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[Turn over]

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
4–5	
6–7	
8–10	
12–15	
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20–21	
22–23	
24–26	
27–29	
30–31	
32–35	
36–39	
40–42	
44–46	
TOTAL	