

Ma

YEAR
8

LEVELS
4–6

PAPER
2

Year 8 mathematics test

Paper 2

Calculator allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your details in the spaces below.

First name _____

Last name _____

Class _____

Date _____

Remember

- The test is 1 hour long.
- You **may** use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, an angle measurer or protractor and a calculator.
- Some formulae you might need are on page 2.
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marking
use only

Total marks

--

Instructions

Answers



This means write down your answer or show your working and write down your answer.

Calculators

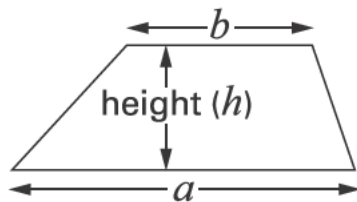


You **may** use a calculator to answer any question in this test.

Formulae

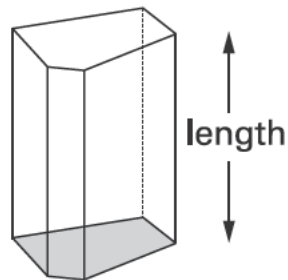
You might need to use these formulae.

Trapezium



$$\text{Area} = \frac{1}{2}(a + b)h$$

Prism



$$\text{Volume} = \text{area of cross-section} \times \text{length}$$

1 Look at this equation.

$$a + b = 7$$

Write three **different** solutions to the equation.



$a = \dots\dots\dots \quad b = \dots\dots\dots$

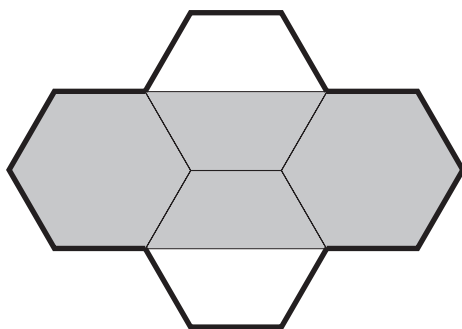
$a = \dots\dots\dots \quad b = \dots\dots\dots$

$a = \dots\dots\dots \quad b = \dots\dots\dots$

.....
.....
2 marks



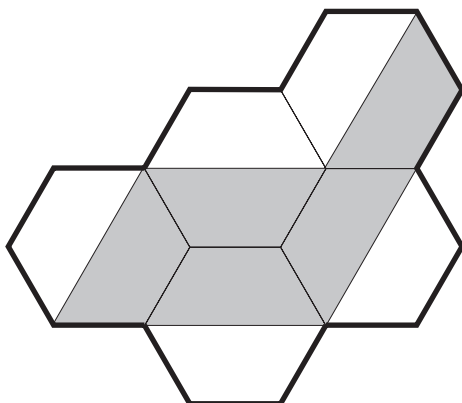
- 2 (a) This shape is made from regular hexagons.
What **fraction** of the shape is shaded?



.....

1 mark

- (b) This shape is also made from regular hexagons.
What **fraction** of the shape is shaded?



.....

1 mark

3 A teacher gives each pupil in his class one ticket.

The tickets are numbered **1 to 30**

The teacher is going to choose one of these tickets at random.

(a) Vani says:

'It is **more likely** that the ticket number will have **2 digits than 1 digit**'.

Is she correct? Tick (✓) Yes or No.



Yes

No

Explain your answer.



1 mark

(b) Jenny says:

'Ticket **number 12** is **more likely than** ticket **number 1**'.

Is she correct? Tick (✓) Yes or No.



Yes

No

Explain your answer.



1 mark



4

Arun has **five dice**, each **numbered 1 to 6**

He throws the five dice.

Three of the dice show the **same number** as each other.The other **two** show the **same number** as each other.The **total** score is **17**

What numbers could Arun have thrown?



.....

or



.....

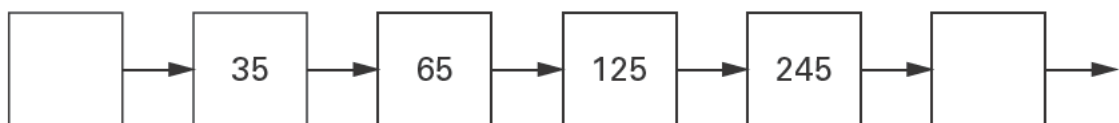
.....

2 marks

5

The rule to get the next number in this number chain is

double, then subtract 5

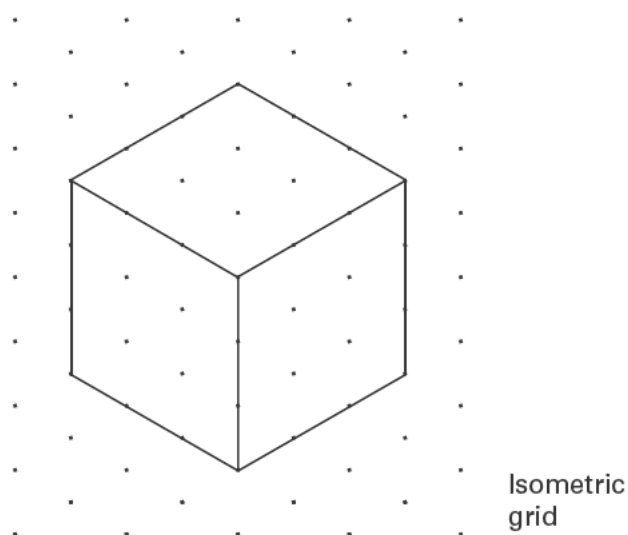
Fill in the **two** missing numbers in the number chain.

.....

2 marks

6

Here is a diagram of a cube.



Fill in the missing numbers.

The first one is done for you.

The diagram shows³..... faces,



but a cube has faces altogether.

1 mark

The diagram shows edges,

but a cube has edges altogether.

1 mark

The diagram shows vertices,

but a cube has vertices altogether.

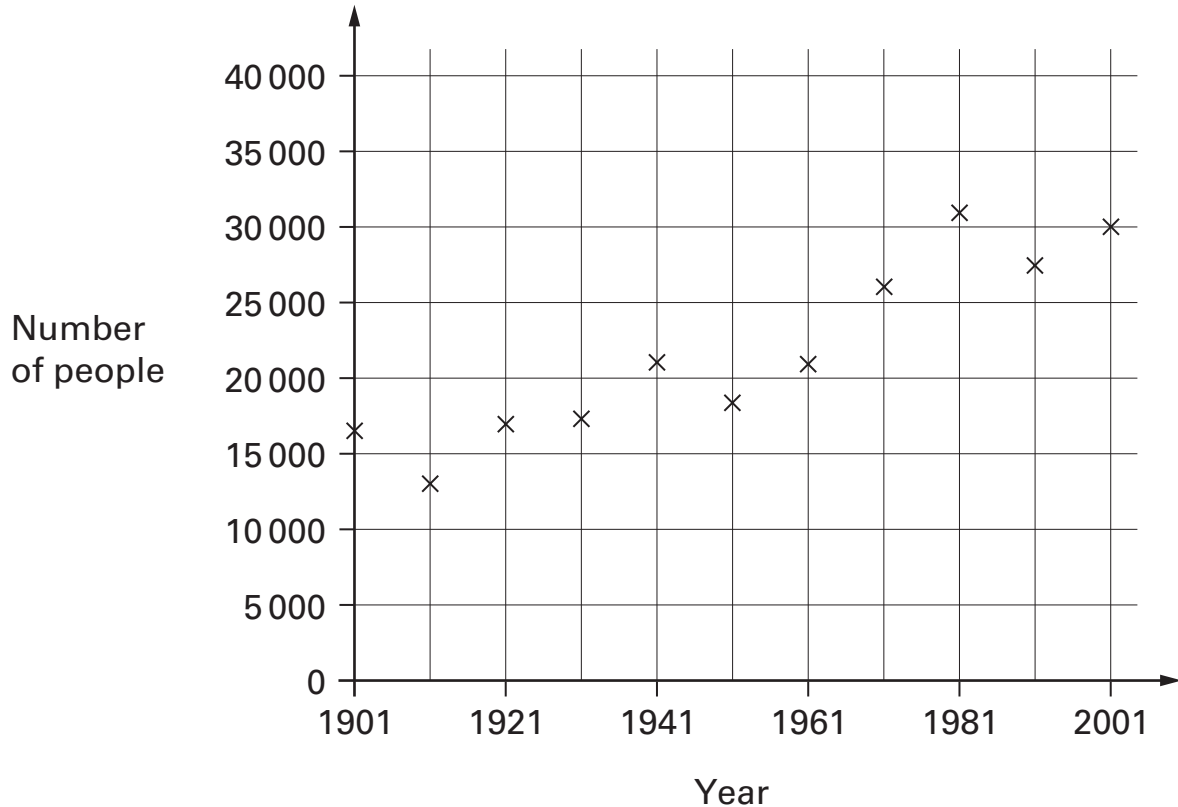
1 mark



7

Every ten years the government collects information in a survey about people in this country.

The graph shows some of the information about a town called Tinworth.



(a) About how many people lived in Tinworth in **1911**?



.....

1 mark

(b) The number of people in 1911 **doubled** by what year?



.....

1 mark

(c) Generally the number of people increased.

How many times did the number of people **decrease** between surveys?



..... times

1 mark

8

Here are the ingredients to make 12 doughnuts.

200 g	flour
40 g	margarine
60 ml	milk
50 g	sugar
1	egg
Makes 12 doughnuts	

Jake wants to make **18** doughnuts.

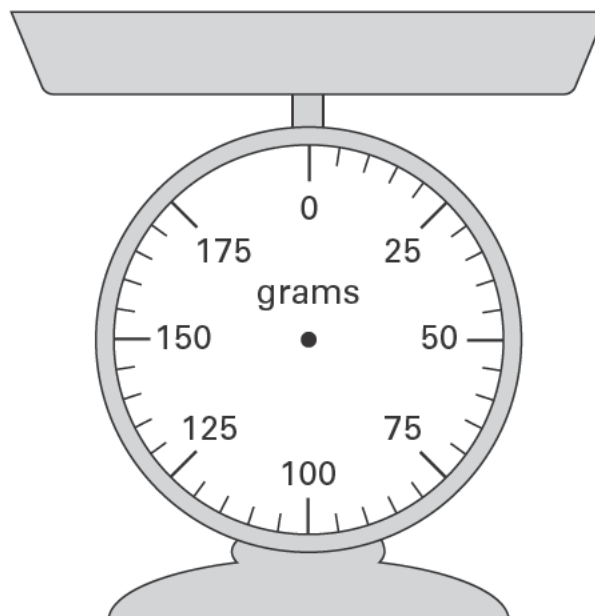
(a) How much **margarine** does he need?



..... g

1 mark

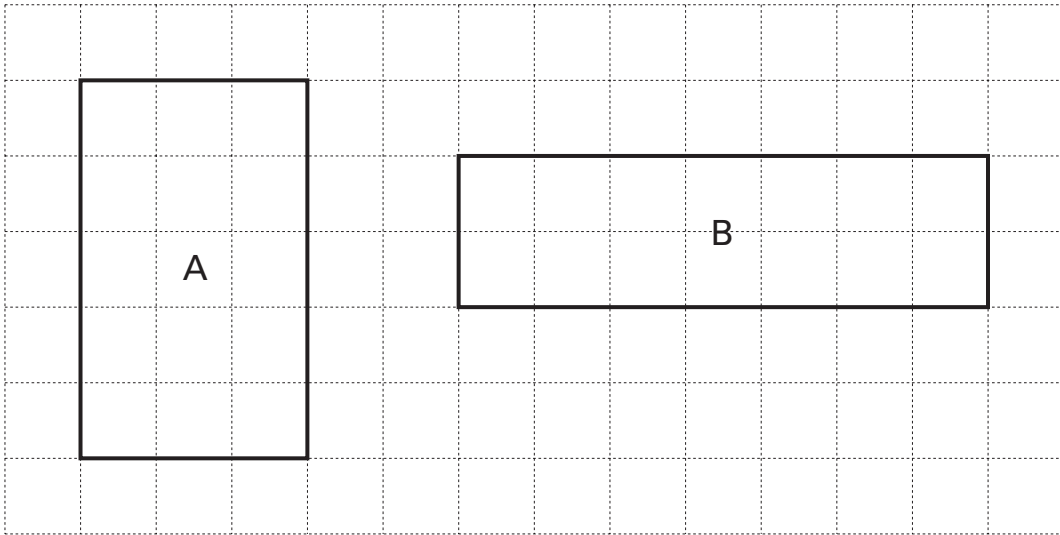
(b) Draw an arrow on the scale below to show how much margarine he needs.



1 mark



- 9 Look at the two rectangles on the centimetre square grid.



- (a) Which rectangle has the **larger perimeter**?

Tick (✓) A or B.



A

B

Explain how you know.



1 mark

- (b) Which rectangle has the **larger area**?

Tick (✓) A or B.



A

B

Explain how you know.



1 mark

10

Here is an algebra puzzle.

The shaded column shows the total of each row.

For example: $a + a + a = 24$

a	a	a	24
a	b	b	28
a	b	c	19

Work out the values of a , b and c

1 mark

1 mark



$a = \dots\dots\dots$ $b = \dots\dots\dots$ $c = \dots\dots\dots$

1 mark



11

Leap year

1 month has 29 days.
4 months have 30 days.
7 months have 31 days.

Not a leap year

1 month has 28 days.
4 months have 30 days.
7 months have 31 days.

- (a) In a **leap year**, what is the **probability** that a month chosen at random has exactly **28 days**?



1 mark

- (b) In a year that is **not a leap year**, what is the **probability** that a month chosen at random has exactly **28 days**?



1 mark

- (c) In any year, what is the **probability** that a month chosen at random has **31 days**?



1 mark

- 12** Most new ovens have temperatures marked in $^{\circ}\text{C}$
Some old ovens have temperatures marked in units called gas marks.

Here is how to change gas marks to $^{\circ}\text{C}$:



- (a) Gas mark **6** is hotter than gas mark **2**

How many $^{\circ}\text{C}$ hotter?



..... $^{\circ}\text{C}$

.....
2 marks

- (b) What gas mark is **190°C** ?

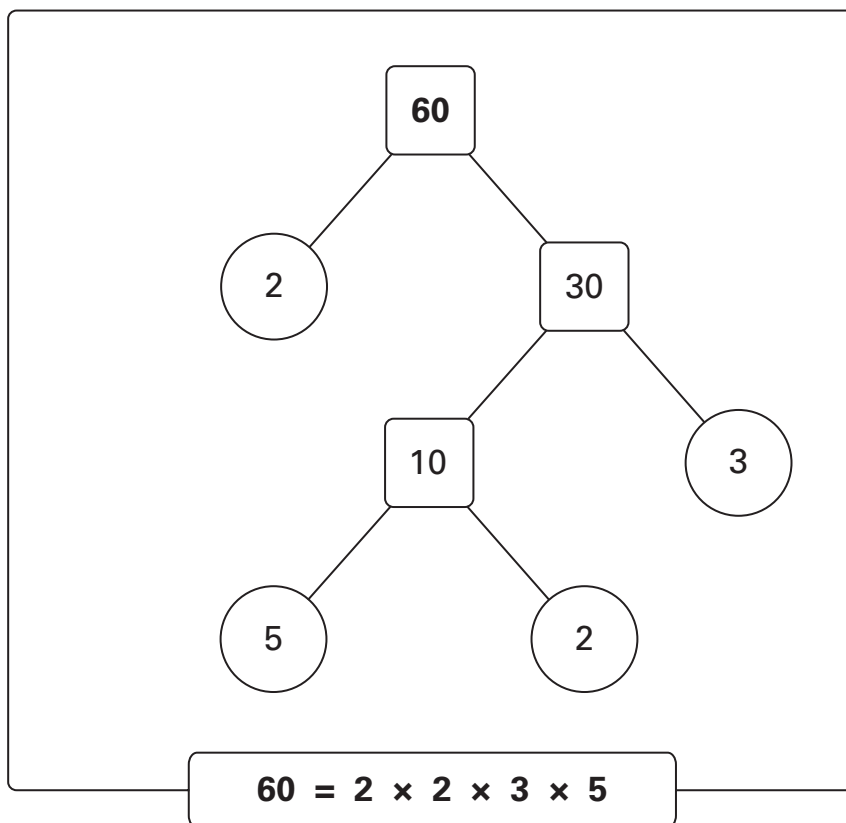


Gas mark

.....
2 marks



- 13** You can write any whole number as a product of its prime factors.
Here is an example for the number 60:



Write **225** as a product of its prime factors.



$$225 = \dots\dots\dots$$

.....
2 marks

- 14 The perimeter of a **rectangle** is one metre.
Each **longer** side is 36 centimetres.

What is the length of each **shorter** side?



..... centimetres

.....
.....
2 marks

- 15 How many **two-digit** numbers have digits that add to twelve?



.....

.....
.....
2 marks



16

Look at this number chain.

Each number is the **square root** of the previous number.(a) What number comes **after 2** in the chain?Give your answer as a **decimal**.

1 mark

(b) What number comes **before 256** in the chain?

1 mark

17 (a) Write these expressions as simply as possible.

The first one is done for you.

$$n + 1 + 2 \longrightarrow n + 3$$



$$3n + 5n \longrightarrow$$

1 mark

$$2n + 7 + n + 2 \longrightarrow$$

1 mark

(b) Multiply $(5n + 2)$ by 3

Write your answer without any brackets.



1 mark



18

Look at these three time intervals.

1 hour 25 minutes

125 minutes

1.25 hours

Arrange them in **size order**, shortest first.

Then fill in the missing number of minutes.



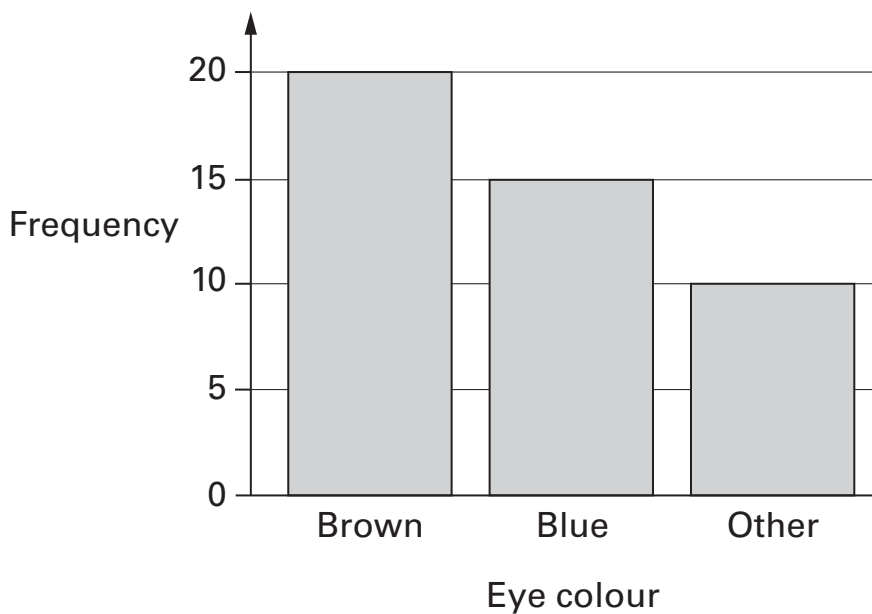
shortest

longest

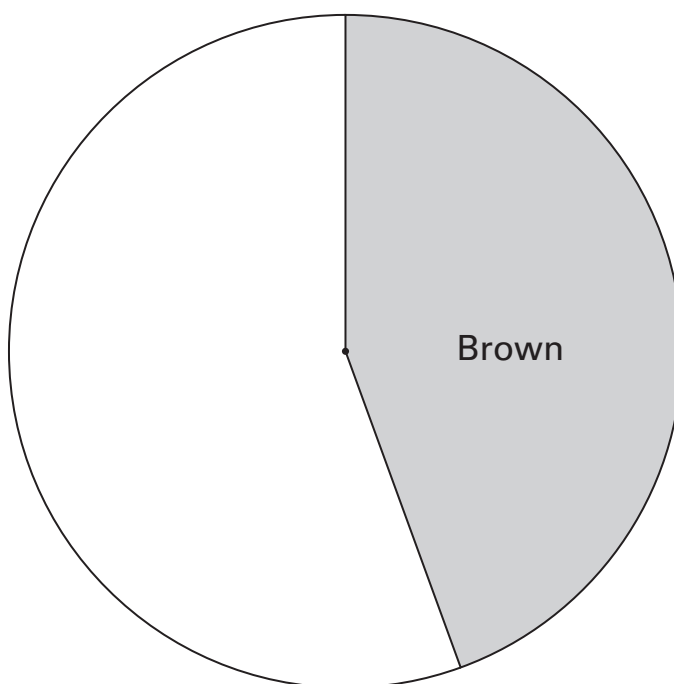
difference in time is minutes

.....
2 marks

19 The bar chart shows the eye colour of 45 different people.



Complete the pie chart to show the same data.

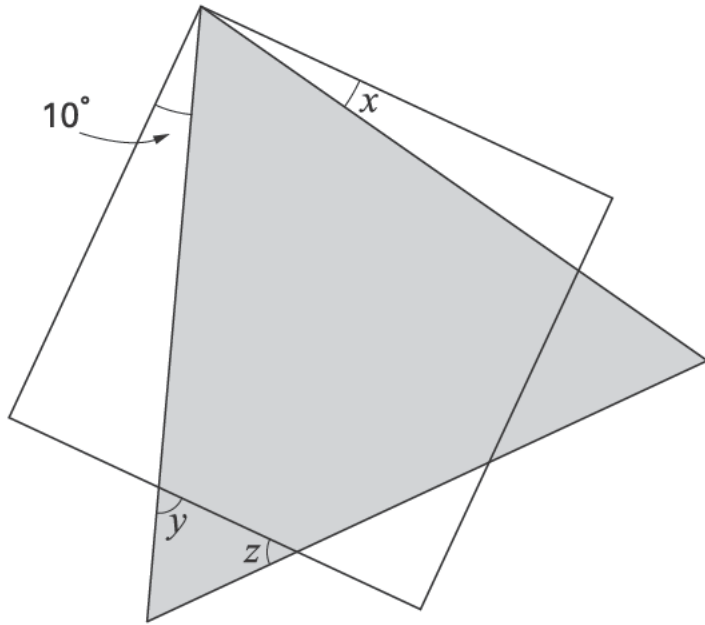


.....
2 marks



20

The diagram shows a **square** and an **equilateral triangle**.



Not drawn accurately

Calculate the sizes of angles x , y and z

1 mark

1 mark



$x = \dots\dots\dots^\circ$

$y = \dots\dots\dots^\circ$

$z = \dots\dots\dots^\circ$

1 mark

21

Work out the answer to:

$$\frac{(128 - 89.6) \times 1.25}{128 - (89.6 \times 1.25)}$$



.....

1 mark

22

Tim Henman is a tennis player.

In 2002 a newspaper published this information about his earnings.

On court earnings	Off court earnings
£ 700 000	£ 2.1 million

What percentage of Tim's **total** earnings was from **off court** earnings?

..... %

2 marks



- 23 Pupils in year 8 wanted to know if pupils in year 7 liked their new school. They wrote a questionnaire.

(a) Here is one question.

Tick (✓) the statement that best describes why you like your new school.

- New subjects
- Able to make new friends
- Bigger playground

Give one reason why this is not a very good question.



1 mark

(b) Here is a different question.

Do you like school dinners?

- Yes No

Give one reason why this is not a very good question.



1 mark

24

The picture shows a two shilling coin.

People used these coins in England before the year 1971.



The **radius** of this coin is **1.4cm**.

What is the **area** of the face of the coin?



..... cm²

.....
2 marks

25

Solve this equation.

$$5y + 3 = 3y + 14$$



$y =$

.....
2 marks



26

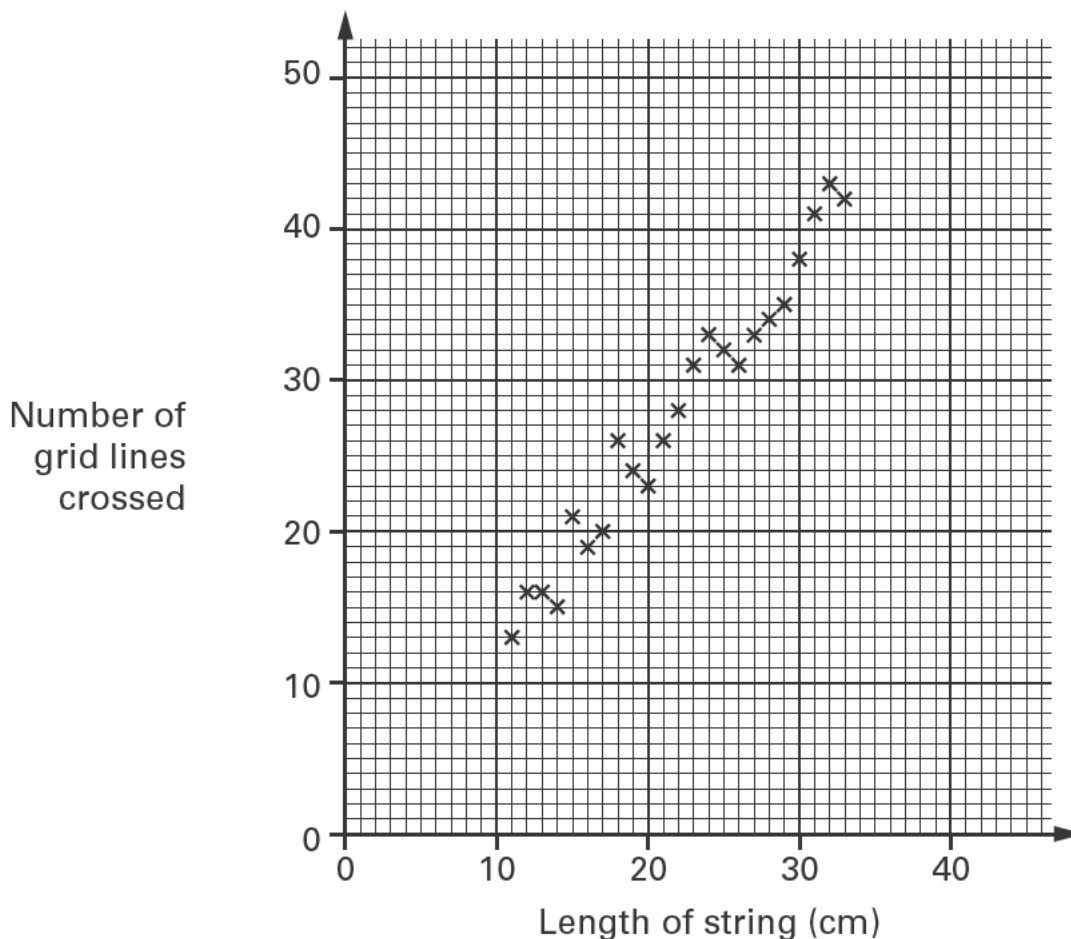
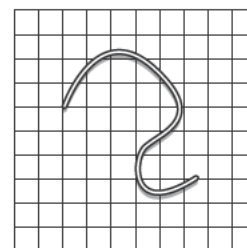
I did an experiment.

I dropped a piece of string onto a square grid.

I recorded the number of grid lines that it crossed.

I repeated the experiment with different lengths of string.

The scatter graph shows my results.



What is the relationship between the length of string and the number of grid lines crossed?



1 mark

27

Different sequences of numbers start like this:

2 4 8 ...

The n th term of one of the sequences is $n(n - 1) + 2$

What is the **4th term** of this sequence?



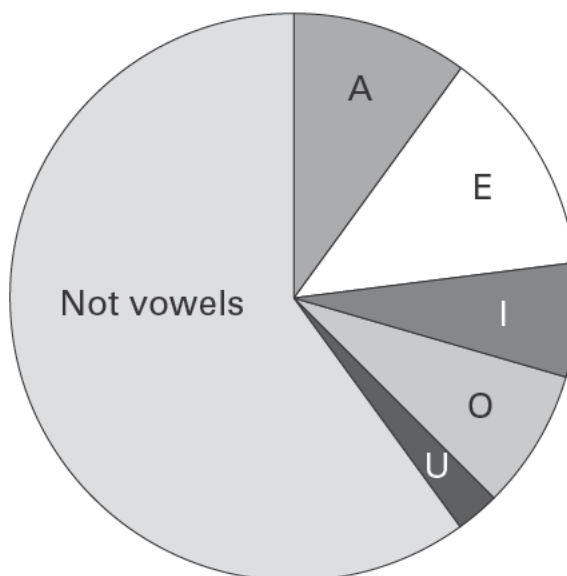
.....

1 mark



28 Writers use some letters of the alphabet more than others.

The pie chart shows how often one writer used vowels (A, E, I, O or U) in a sample of his writing.



Marie says:

'The pie chart shows the letter used most often is E'.

Do you agree with her? Tick (✓) Yes or No.



Yes

No

Explain your answer.



1 mark

END OF TEST



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