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.

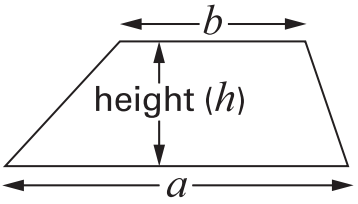
Calculators

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

Formulae

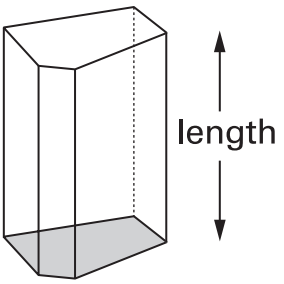
You might need to use these formulae.

Trapezium



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

Prism



Volume = area of cross-section × length

1 Look at this equation.

$$a + b = 7$$

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

a = ... b = ...

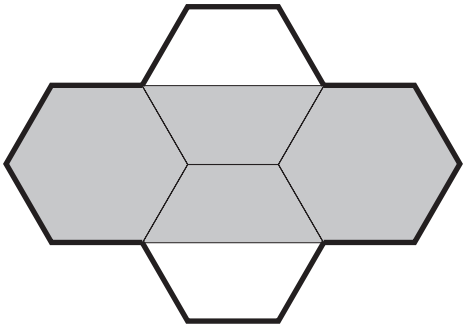
a = ... b = ...

a = ... b = ...

2 marks

2 (a) This shape is made from regular hexagons.

What **fraction** of the shape is shaded?

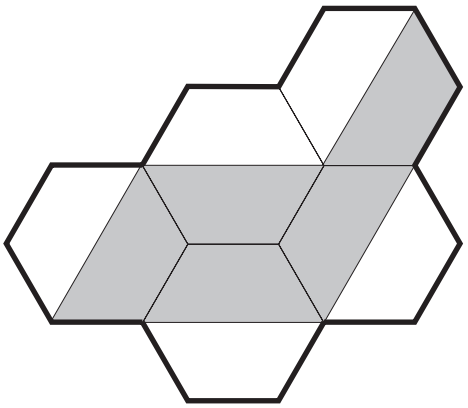


. . . . . .

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

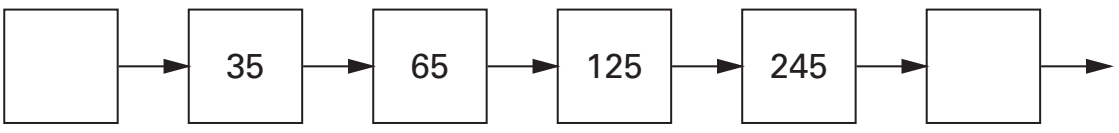
....

2 marks

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

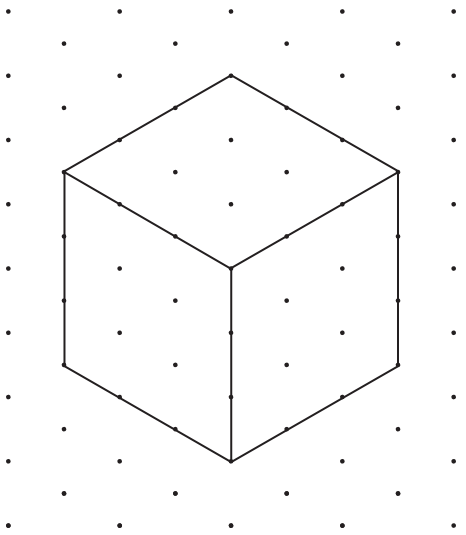
double, then subtract 5

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



2 marks

6 Here is a diagram of a cube.



Isometric grid

Fill in the missing numbers.

The first one is done for you.

The diagram shows ..... *3* ..... faces,

but a cube has ..... faces altogether.

1 mark

The diagram shows ..... edges,

but a cube has ..... edges altogether.

1 mark

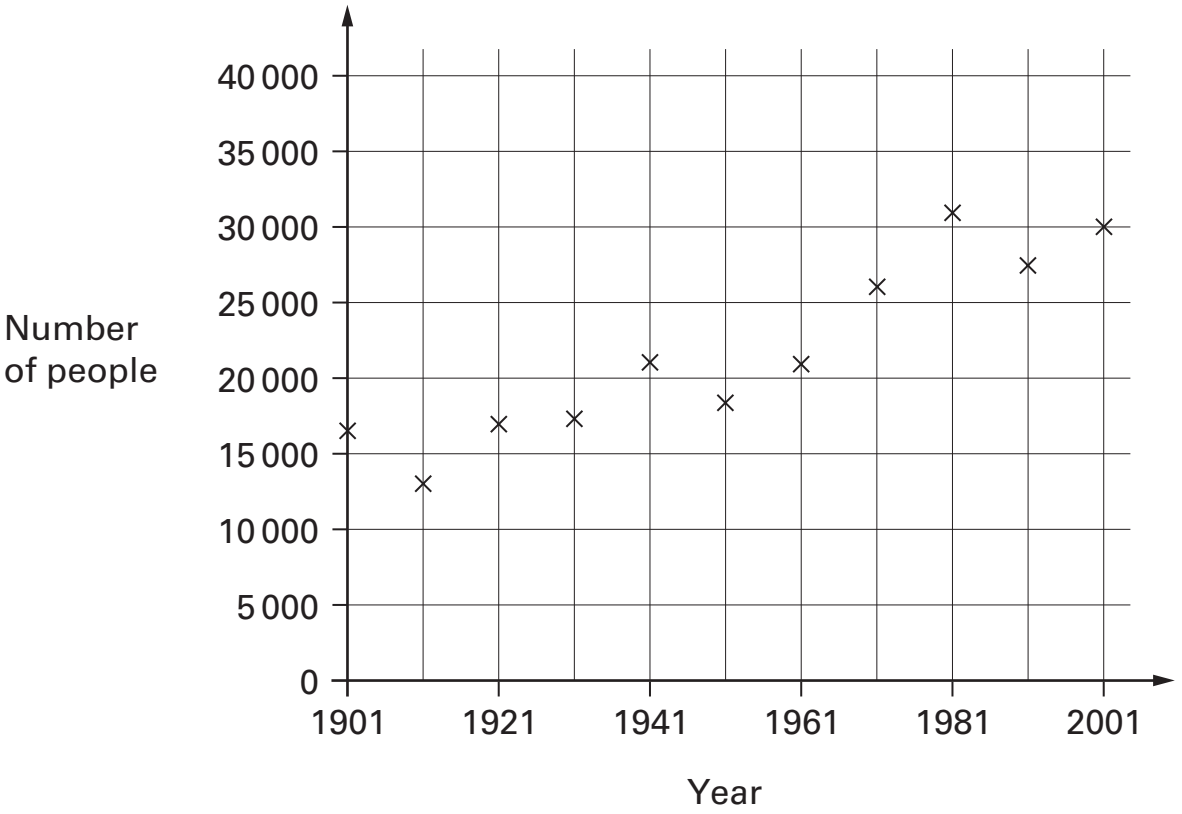
The diagram shows ..... vertices,

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**

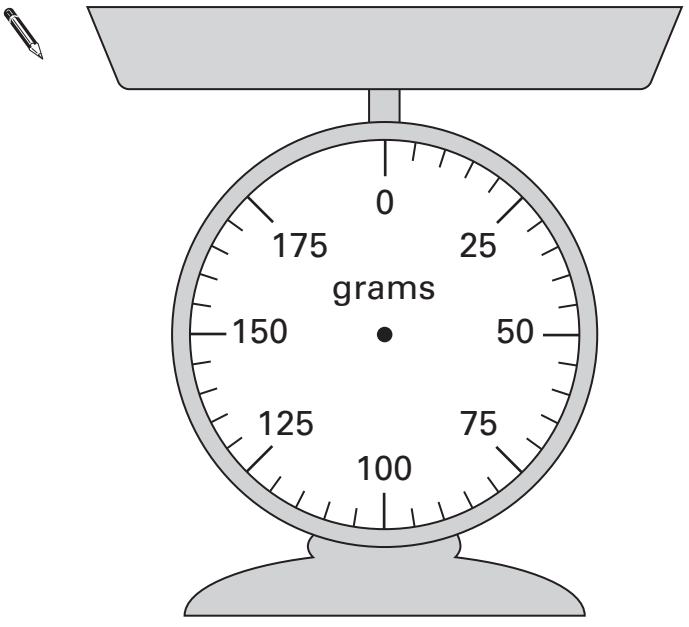
Jake wants to make **18** doughnuts.

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

..... g

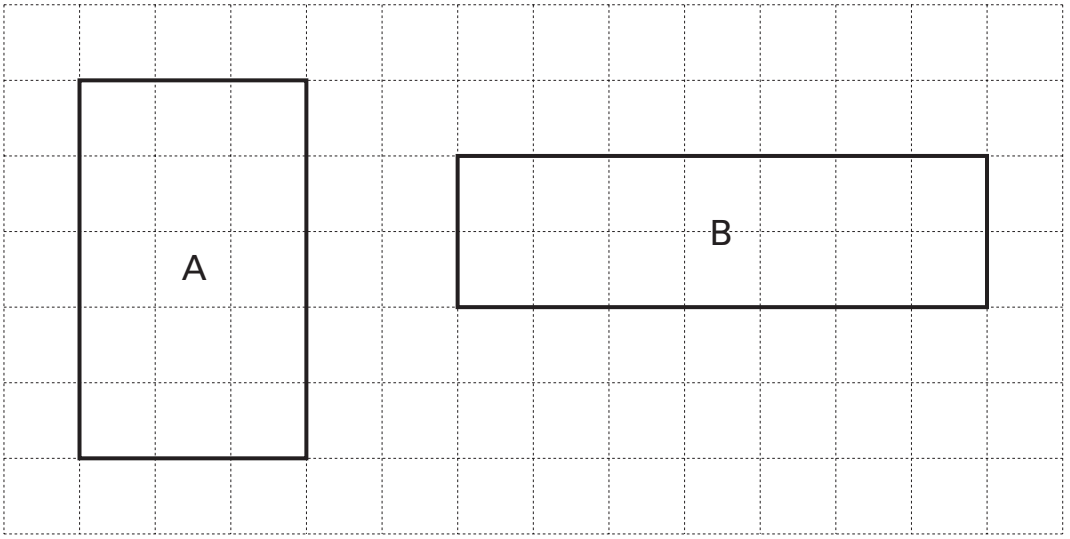
1 mark

(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

$a =$ ..... $b =$ ..... $c =$ .....

. . . . .
1 mark

11

Leap year	**Not a leap year**
1 month has 29 days.	1 month has 28 days.
4 months have 30 days.	4 months have 30 days.
7 months have 31 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

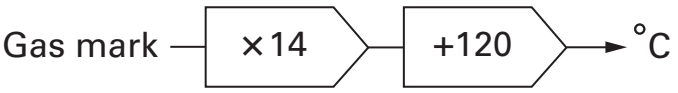
(c) In any year, what is the **probability** that a month chosen at random has **31 days**?

1 mark

12 Most new ovens have temperatures marked in °C

Some old ovens have temperatures marked in units called gas marks.

Here is how to change gas marks to °C :



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

How many °C hotter?

..... °C

2 marks

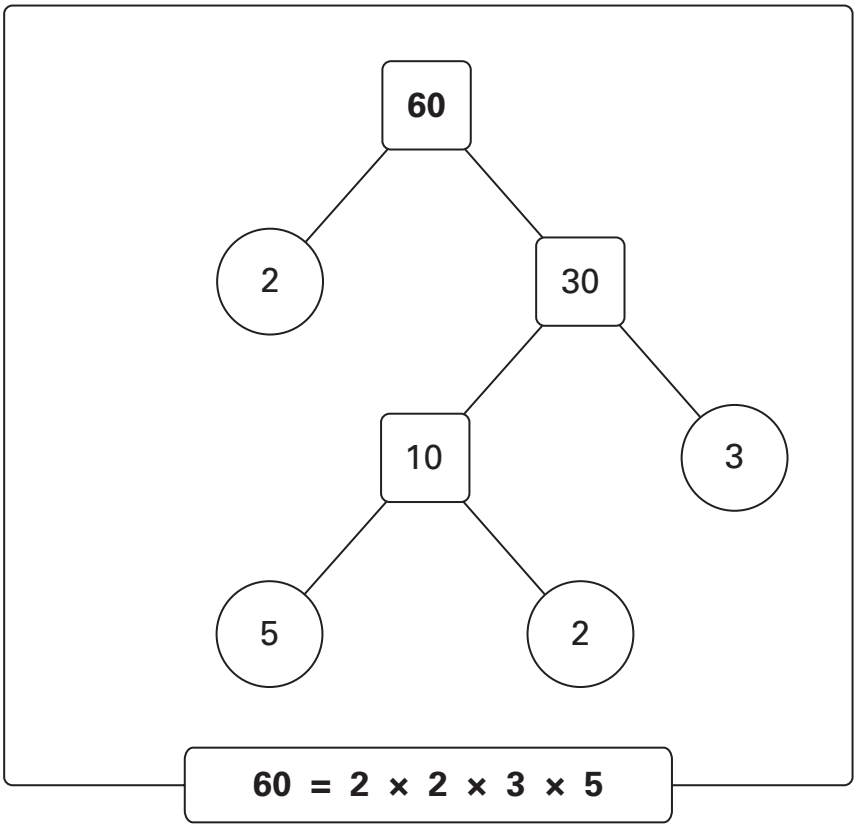
(b) What gas mark is **190°C**?

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 = ...

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

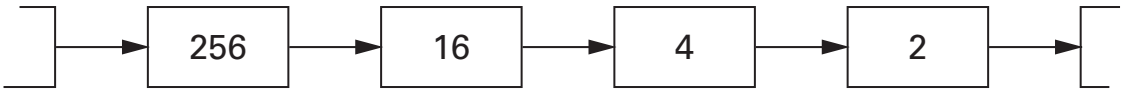
2 marks

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.

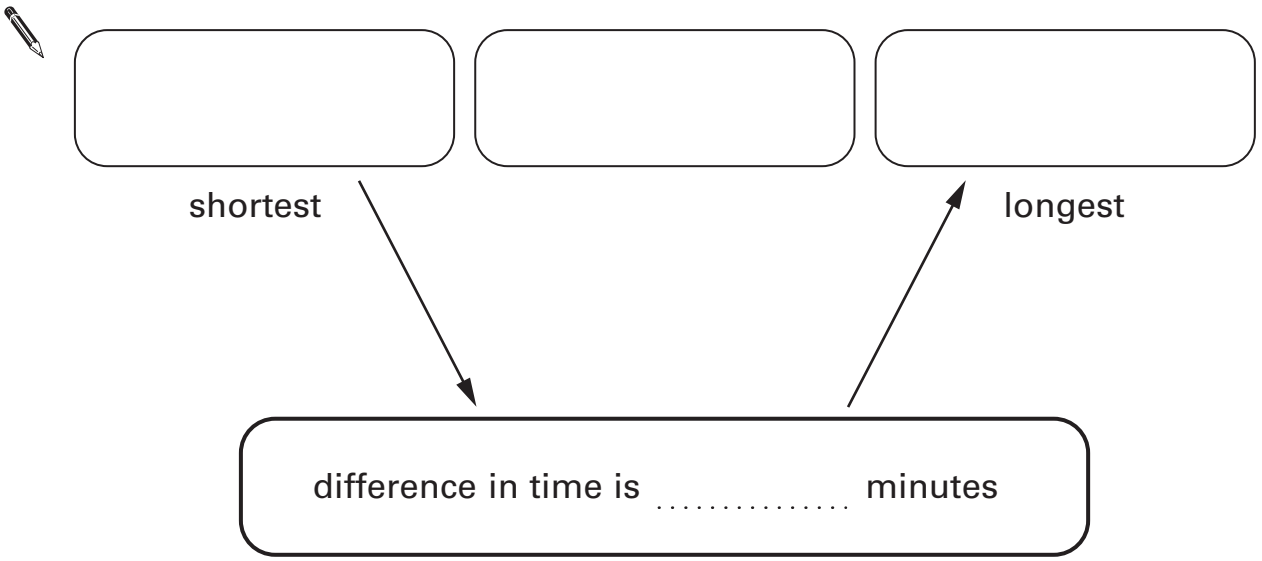
1 mark

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.

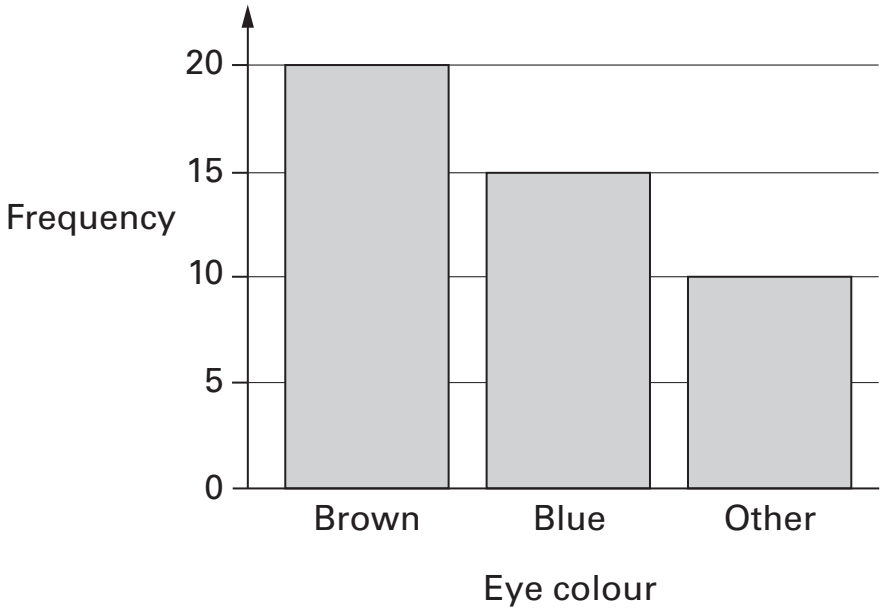


. . . . .

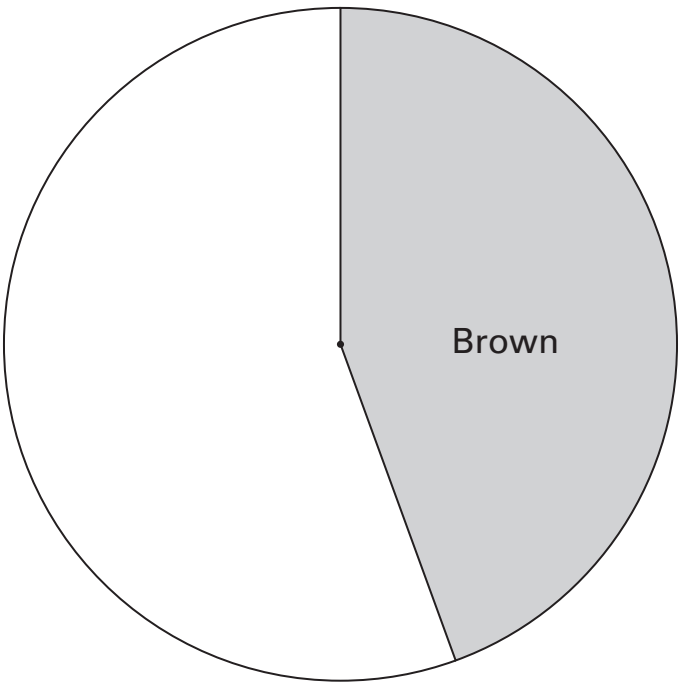
. . . . .

2 marks

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



Complete the pie chart to show the same data.

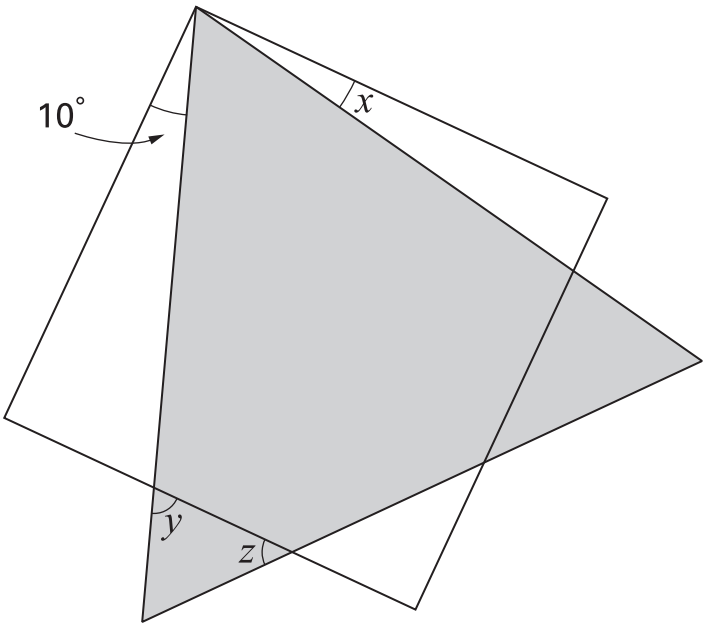


. . . .

. . . .

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 = ... ° y = ... ° z = ... °

. . . . .
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 **1.4 cm**.

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

..... cm^2

2 marks

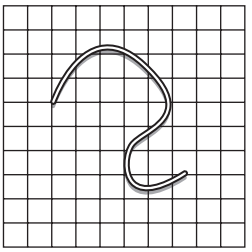
25 Solve this equation.

$5y + 3 = 3y + 14$

$y =$ .....

2 marks

26 I did an experiment.

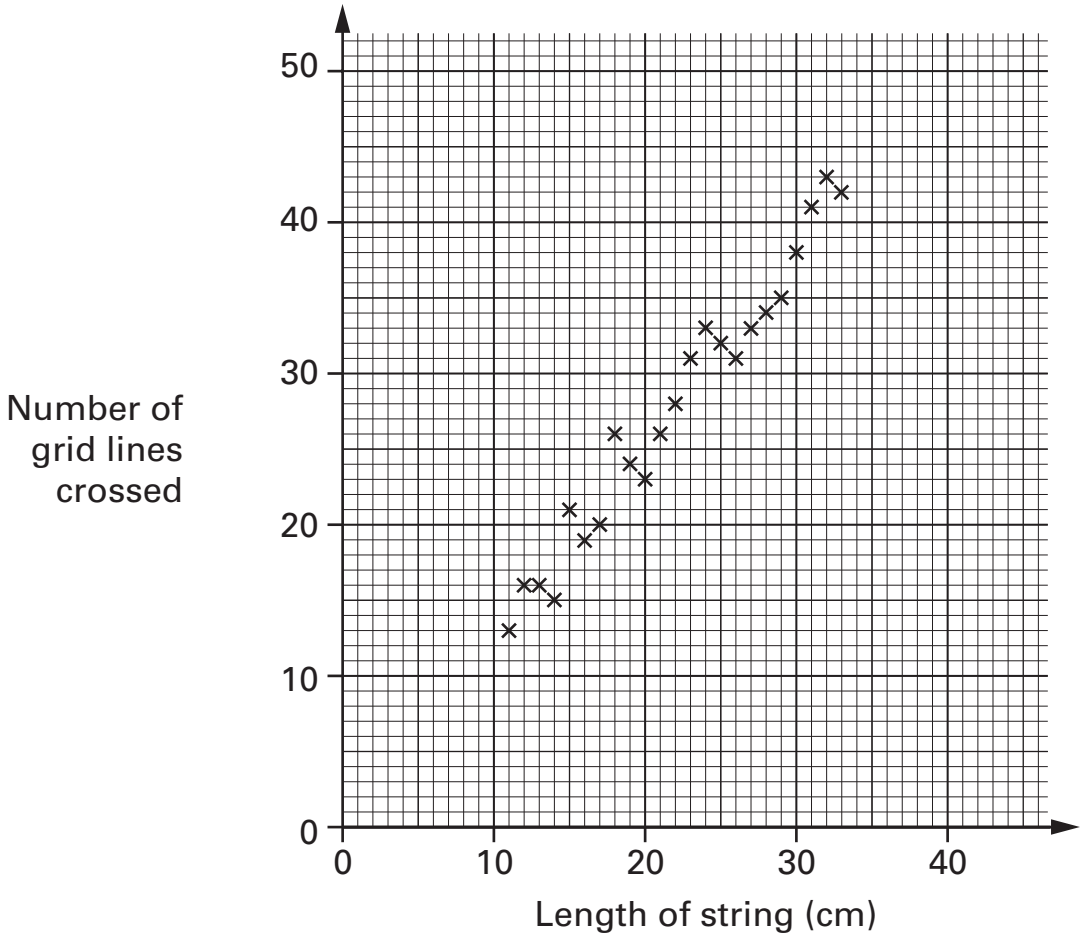


I dropped a piece of string onto a square grid.

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 nth term of one of the sequences is $\boldsymbol{n(n-1)+2}$

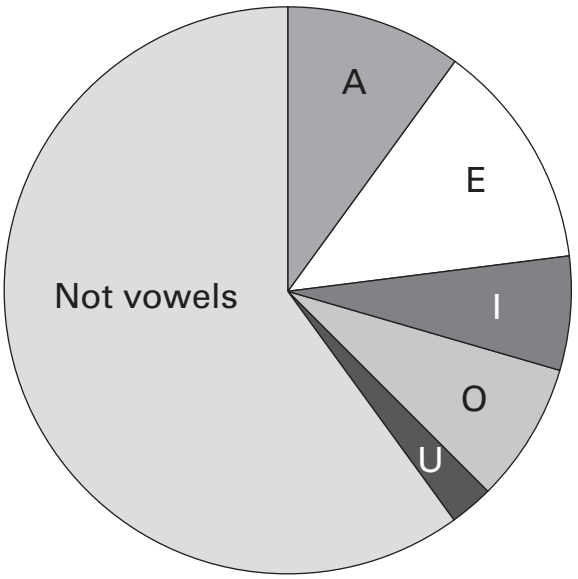
What is the **4th term** of this sequence?

. . . . . .

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

QCA, Years 7 and 8 Team, 83 Piccadilly, London W1J 8QA

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