

Ma

YEAR

8

LEVELS

4–6

TEST

B

Mathematics

Test B

Calculator allowed

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

Name

Class

Teacher

Date

Remember

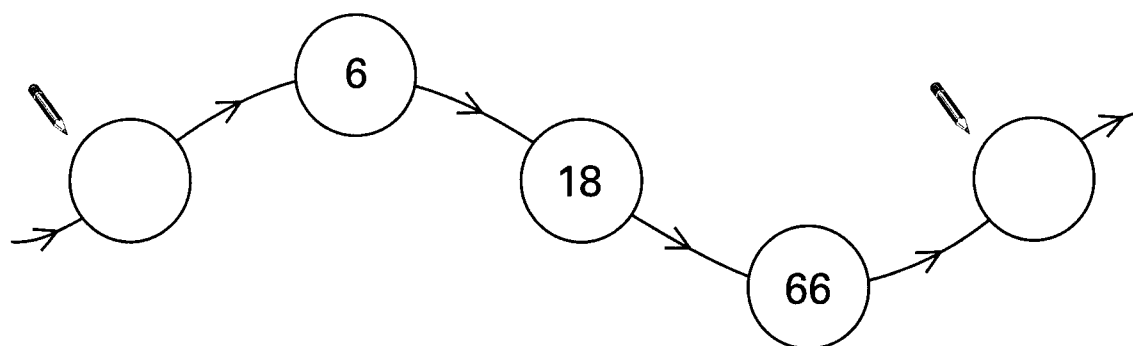
- The test is 50 minutes long.
- You may use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, tracing paper or mirror (optional) and a calculator.
- Some formulae you might need are on page 2.
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's
use only

Total marks

- 1 (a) The rule to get the next number in this number chain is **multiply by 4 then subtract 6**

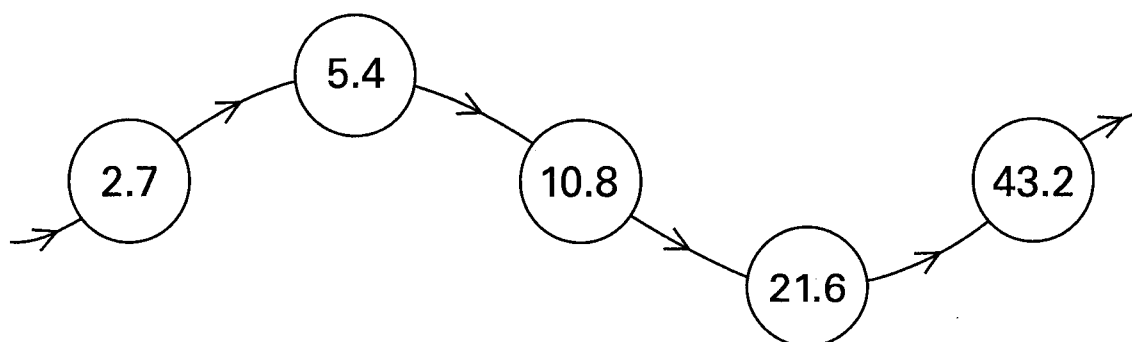
Fill in the **two** missing numbers in the number chain.



.....

.....
2 marks

- (b) This number chain has a different rule.



Write what the rule might be.



.....

1 mark



2

I'm thinking of a number.

I work out the product of **8** and my number.

The answer is **24**

What is my number?



.....

1 mark

3

Li and Sue do the same survey.

Their pictograms represent the **same information**.

Li's pictogram

Male 

Female 


Key:  represents 2 people

Sue's pictogram

Male 

Female 

Sue has forgotten to write her key.

How many people does  represent?

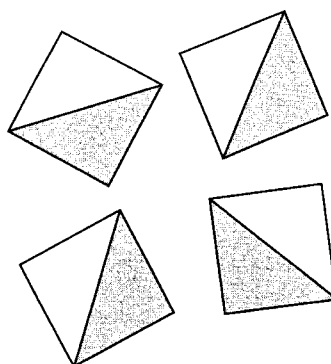


..... people

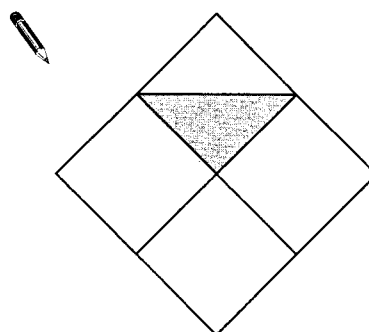
1 mark

4

I have four identical square tiles.

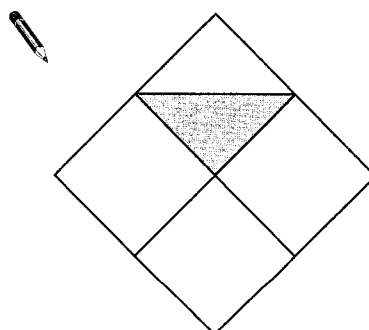


- (a) Show how the four tiles can fit together to make a pattern with **4 lines of symmetry**.



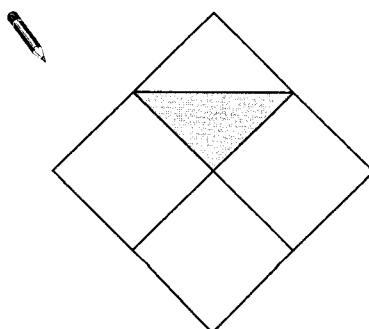
1 mark

- (b) Now show how the four tiles can fit together to make a pattern with **no lines of symmetry**.



1 mark

- (c) Show how the four tiles can fit together to make a pattern with **rotation symmetry of order 2**.



1 mark



- 5 (a) A one franc coin is 2.35 cm in diameter.



I put **four** one franc coins in a row.



What is the length of the row?


 cm

1 mark

- (b) Then I put **four** 25 cent coins in a row.

The length of the row is **7.4 cm**.



What is the diameter of one 25 cent coin?


 cm

1 mark

- (c) Then I make a row of alternate one franc coins and 25 cent coins.
I use **8 coins** altogether.



What is the length of this row of eight coins?

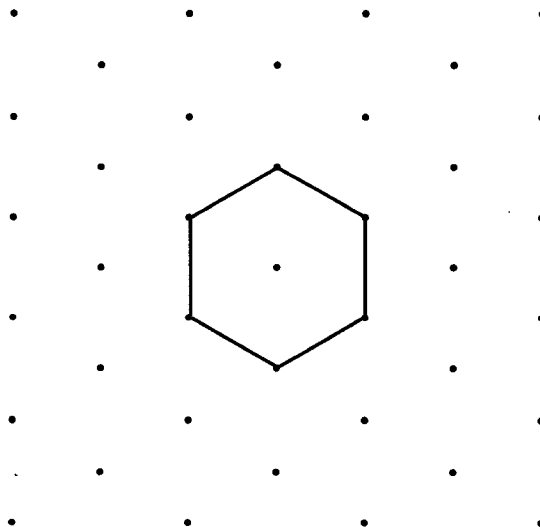


1 mark

6

Simon started a 2-D drawing of a solid cube.

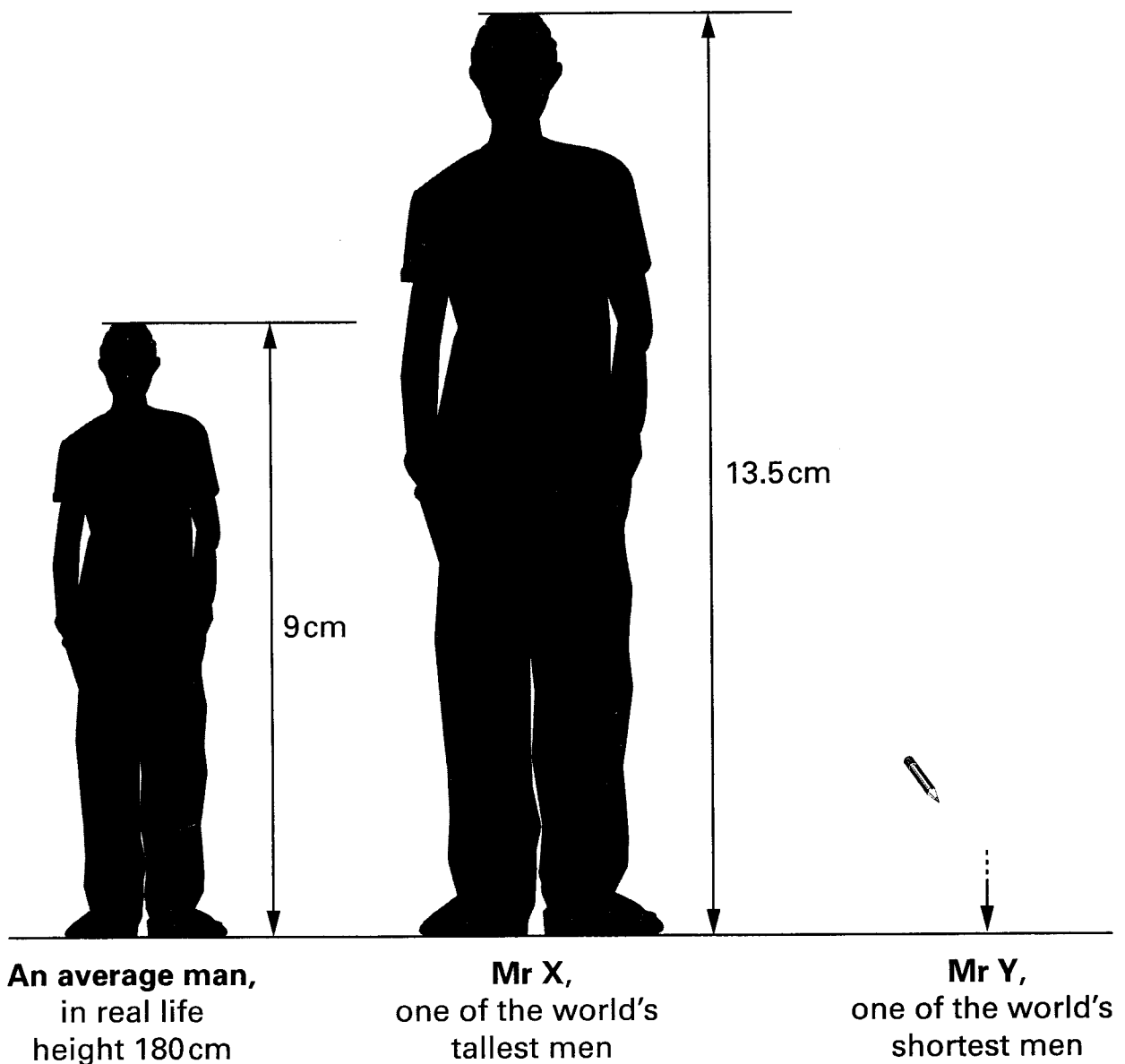
Use **three straight lines** to complete Simon's drawing.



1 mark



- 7 This question is about heights of men and scale drawing.



1 cm on the drawing represents 20 cm in real life.

- (a) In real life, what is the height of Mr X?

 cm

1 mark

- (b) In real life, the height of Mr Y is **80 cm**.

Complete the **arrow** on the scale drawing to show Mr Y's height.

You should not draw the man.

1 mark

8 (a) Arrange these lengths in order of size.

10 kilometres

10 metres

10 miles

10 centimetres



.....

.....

.....

.....

Shortest



Longest

1 mark

(b) Arrange these masses in order of size.

10 grams

10 kilograms

10 milligrams

10 pounds



.....

.....

.....

.....

Lightest



Heaviest

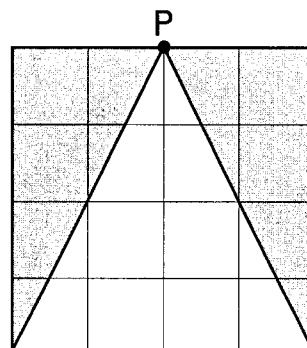
1 mark



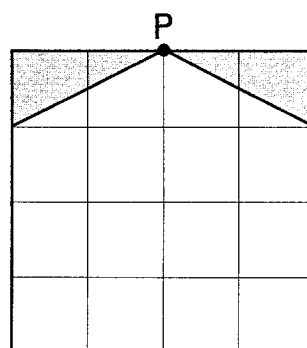
9

In this question, each diagram is drawn on a square grid.

$\frac{1}{2}$ of this diagram is shaded.



(a) Explain how you know $\frac{1}{8}$ of this diagram is shaded.

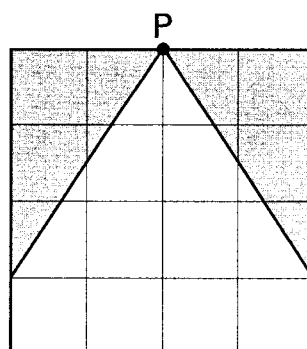


1 mark

(b) What fraction of this diagram is shaded?



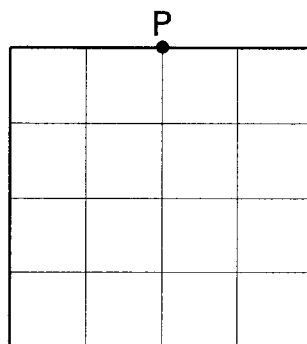
.....



1 mark

(c) **Shade** $\frac{3}{4}$ of this diagram.

You must use only **two straight lines**,
and **both** of the lines must **start** at **point P**



1 mark

10 Simplify these expressions.

The first one is done for you.

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



$$2n + 3n \longrightarrow$$

1 mark

$$3n + 5 + 4n - 2 \longrightarrow$$

1 mark

11 Anila is going to play a game.

The probability that she will win the game is **0.7**

Is she more likely to win the game or lose the game?

Tick (✓) Win or Lose.



Win

☐

Lose

☐

Explain how you know.



1 mark

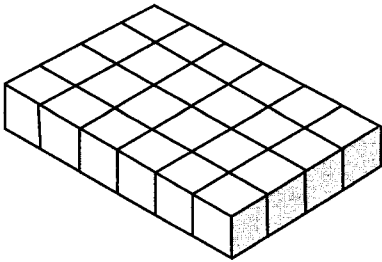
12

Terry has **24** centimetre cubes.
He uses them to make a cuboid that is one cube high.

1 cm high


4 cm wide

6 cm long



Tina has **24** centimetre cubes.
She uses them to make a solid cuboid that is **two cubes high**.

Complete the table to show what the dimensions of her cuboid might be.



2 cm high

.... cm wide

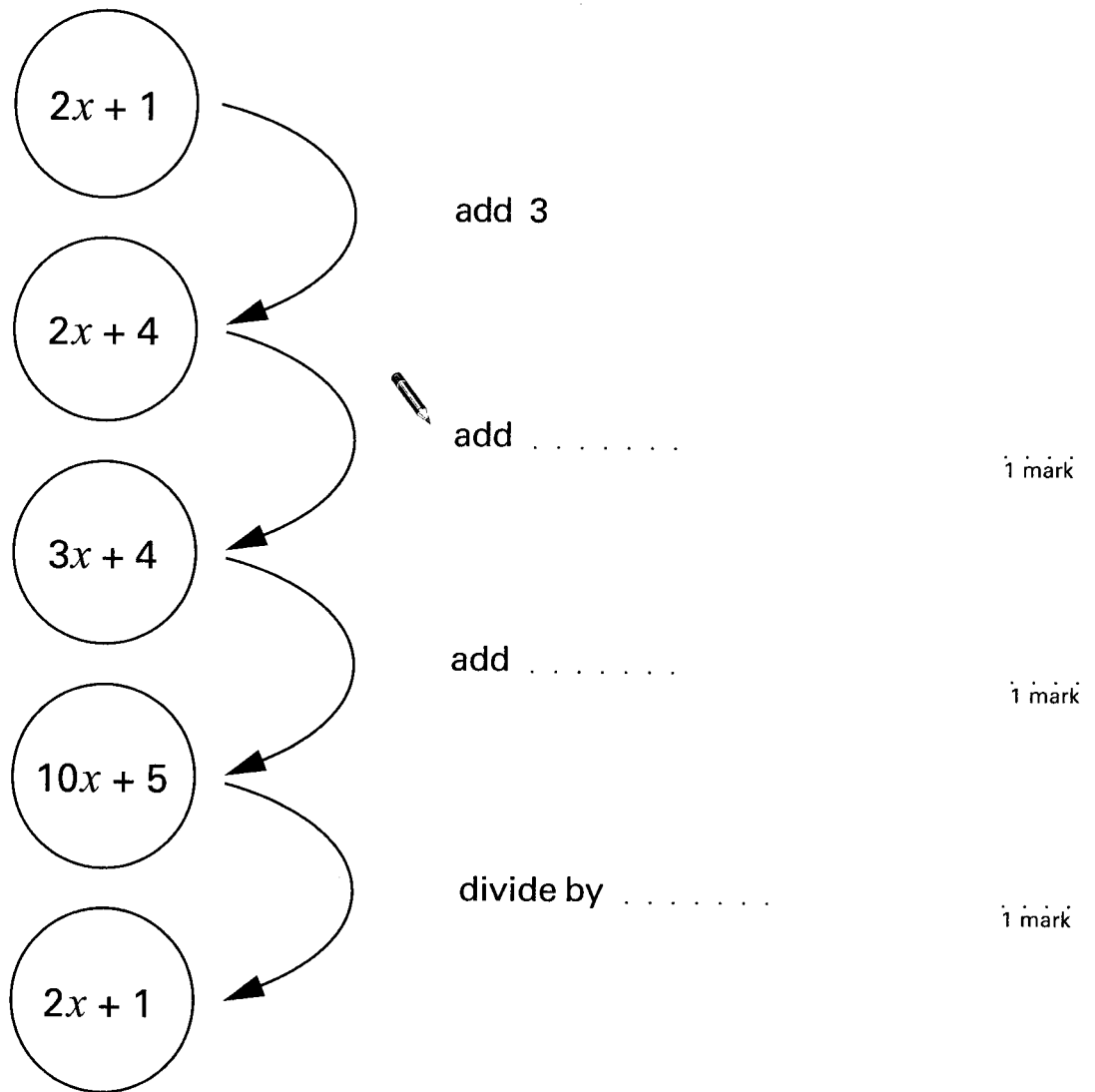
.... cm long

1 mark

- 13 (a) This algebra chain begins and ends with $2x + 1$

Show what to do to move along each step in the chain.

The first step is done for you.



- (b) Multiply $(2x + 1)$ by 6

Write your answer without any brackets.



1 mark



- 14 On World Book Day, each pupil in Year 7 chose one book to read. Some pupils chose a fiction book. Some chose a non-fiction book.

(a) The two-way table shows that:

Altogether, there were 142 pupils.

68 were boys.

77 pupils chose a fiction book.

36 boys chose a non-fiction book.

Complete the two-way table.

Two-way table

	Boys	Girls	Total
Fiction			77
Non-fiction book	36		
Total	68		142

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

(b) What **percentage** of boys chose a non-fiction book?

Show your working.

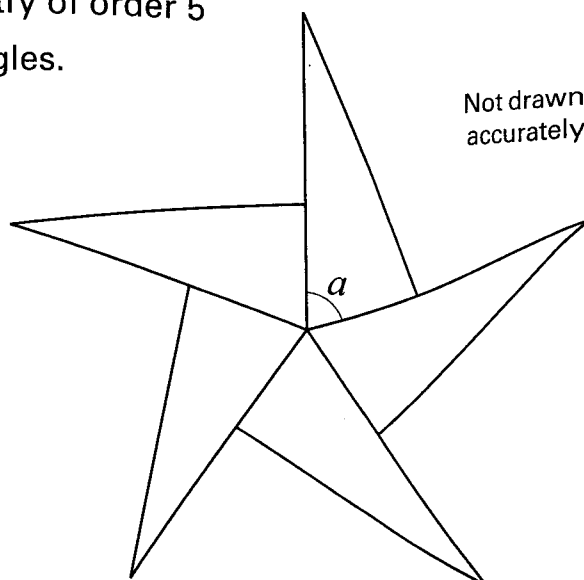


..... %

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

15

This star-shape has rotation symmetry of order 5
It is made from five **congruent** triangles.



(a) Jenny said:

Angle a must be 72°

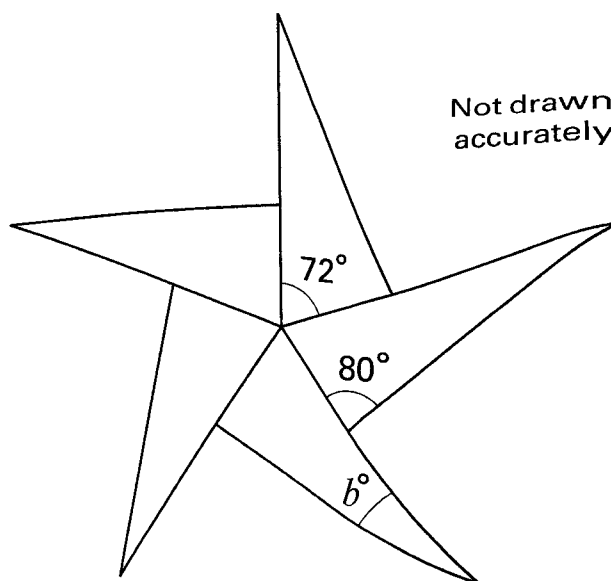
Without measuring, explain how you know she is correct.



1 mark

(b) Work out the size of angle b

Show your working.



angle $b = \dots\dots\dots$

2 marks



16

I have two bags of counters.



I am going to take a counter at random from both bags.

(a) Complete the table to show what colours they might be.

The first one is done for you.

You will **not** need to use all the rows.

first bag	second bag
B	B

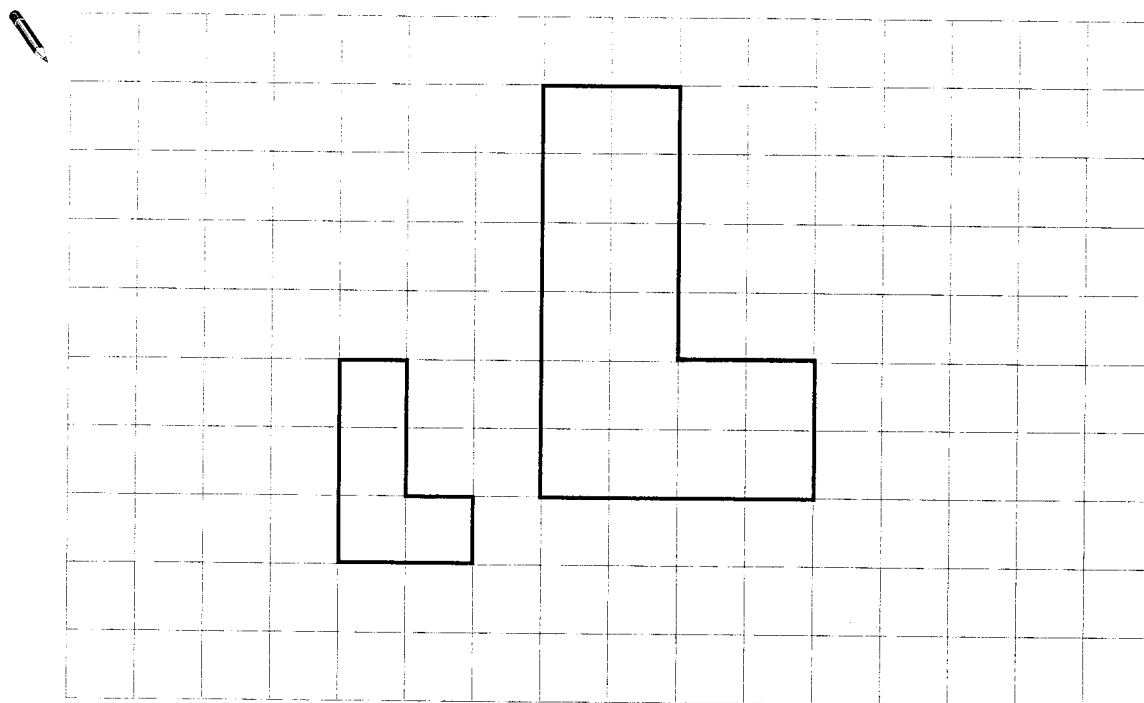
2 marks

(b) What is the probability that both counters will be the **same** colour?

1 mark

17

The grid shows two L-shapes.



The bigger L-shape is an **enlargement** of the smaller L-shape.

(a) What is the **scale factor** of the enlargement?



.....

1 mark

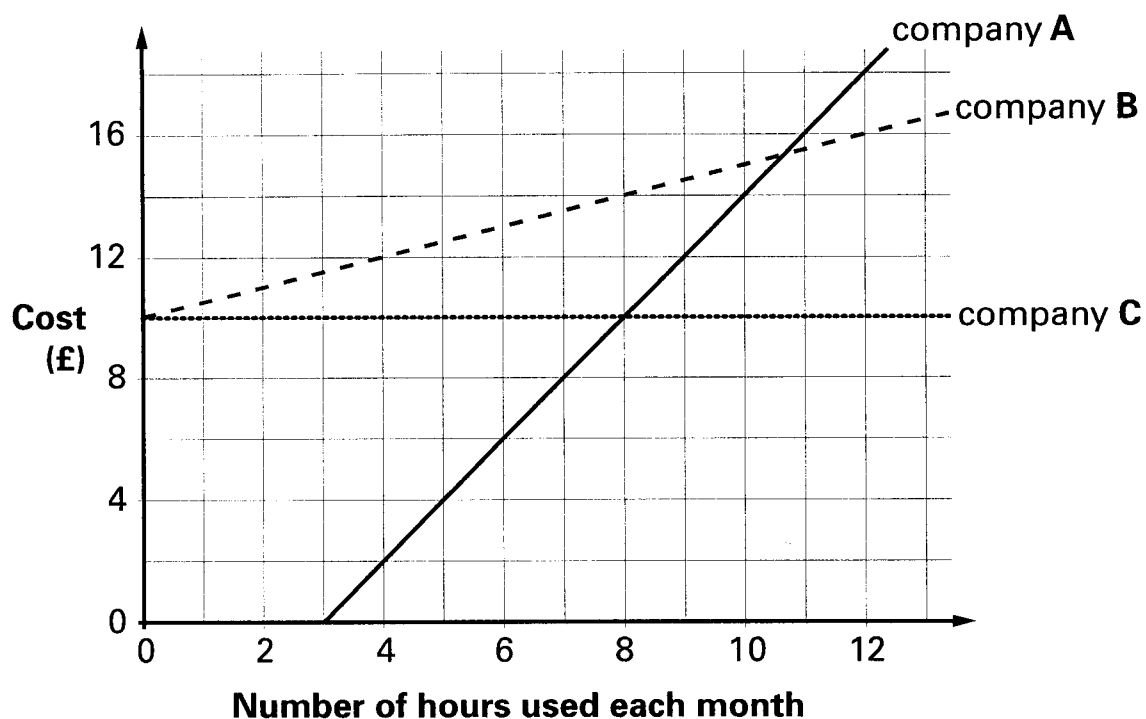
(b) On the grid, show where the **centre of enlargement** is by marking the correct place with a cross.

1 mark



18

Companies charge different amounts to connect people to the Internet. The graph shows how much three companies charge each month.



(a) Fill in the missing numbers in these sentences.



Company **A**:

The first hours used each month are free,
then they charge **£2** for every hour.

1 mark

Company **B**:

They charge £10 each month, with an
extra charge of p for each hour used.

1 mark

(b) Write a sentence to describe the cost each month for company **C**



1 mark

- 19** The average mass of a female heart is **265** grams.
- The average mass of a male heart is **19% greater** than the average mass of a female heart.
- What is the average mass of a male heart?
- Show your working, and write your answer to the nearest gram.



.....
 g

.....
 2 marks

- 20** Gustav says:

There are **100** square centimetres in a square metre.

Gustav is **wrong**.

How many square centimetres are there in a square metre?



..... cm²

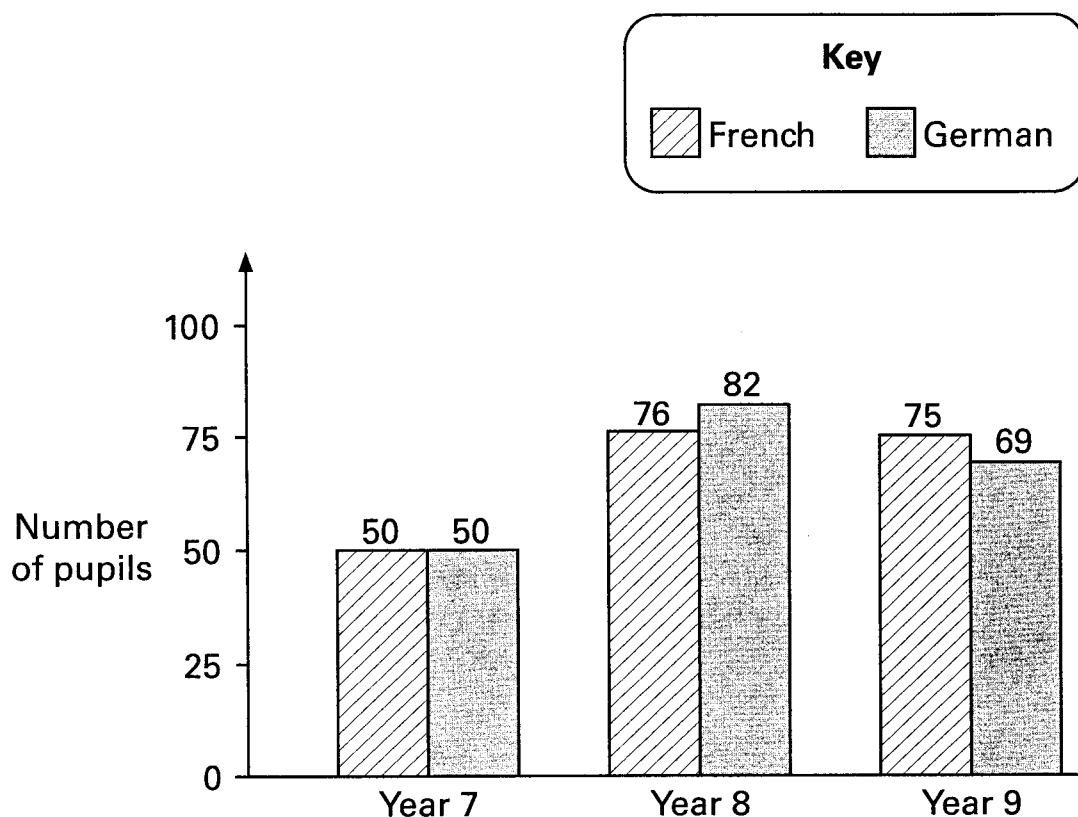
1 mark



21

Pupils at a school learn French, German or both.

The chart shows information about pupils in Years 7, 8 and 9



(a) Alice says:

More of these pupils learn French than German.

Show calculations to explain that Alice is **not** correct.



1 mark

(b) Ben says:

There are **104 pupils** in **Year 8**, so I can work out from the diagram that **54** of them must learn both French and German.

Ben is correct.

Explain how he worked it out.



1 mark

(c) Altogether, **76** pupils in **Year 8** learn French.

How many pupils in Year 8 learn French but do not learn German?



.....

1 mark



22

People who live to be 100 years or older are called centenarians.

In 1998 there were **135 000** centenarians.

The **ratio** of **male** to **female** was **1 : 4**

How many **female** centenarians were there in 1998?

Show your working.



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2 marks