

Ma

KEY STAGE

3

TIER

4–6

Year 9 mathematics test

Paper 1

Calculator not allowed

First name _____

Last name _____

Class _____

Date _____

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name, the name of your class and the date in the spaces above.

Remember:

- The test is 1 hour long.
- You **may not** use a calculator for any question in this test.
- You will need: a pen, pencil, rubber and a ruler. You may find tracing paper useful.
- 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	
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Instructions

Answers



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

Calculators



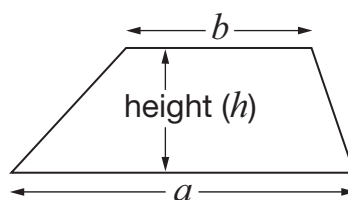
You **may not** use a calculator to answer any question in this test.

Formulae

You might need to use these formulae

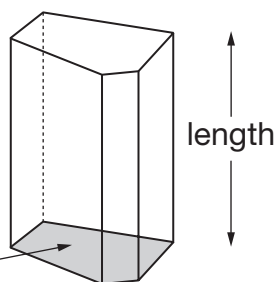
Trapezium

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



Prism

area of cross-section



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

1. The table shows information about all the pupils in a class.

	Number of boys	Number of girls
Brown eyes	9	7
Blue eyes	3	8

Use the table to show what the numbers below represent.

The first one is done for you.

There are **9** boys with brown eyes.



There are **8** _____

1 mark



There are **15** _____

1 mark



There are **27** _____

1 mark



2. (a) Join dots to make a **four-sided shape** that has **four equal angles**.



1 mark



- (b) Now join dots to make a **four-sided shape** that does **not** have four equal angles.



1 mark

3. In each part, tick (✓) the amount that is **most likely**.



The **weight** of the mouse is...

☐ 30 feet
 ☐ 30 millilitres
 ☐ 30 grams
 ☐ 30 seconds

1 mark



The water bottle **holds**...

☐ 1 litre
 ☐ 10 litres
 ☐ 100 litres
 ☐ 1000 litres

1 mark

The **height** of the front door is...

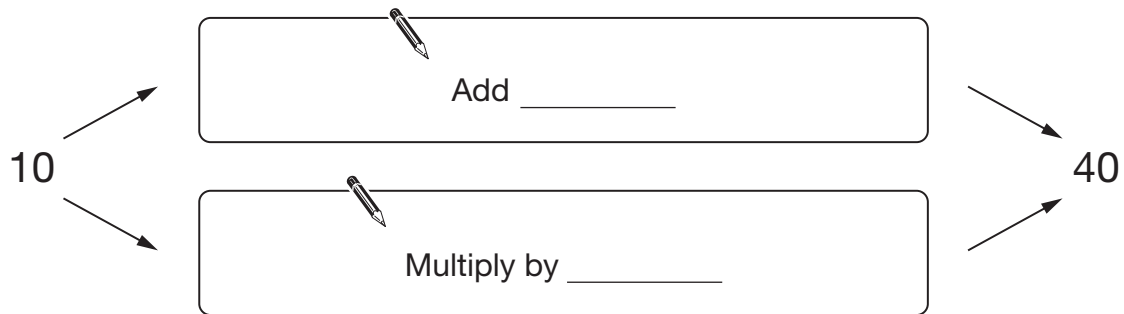
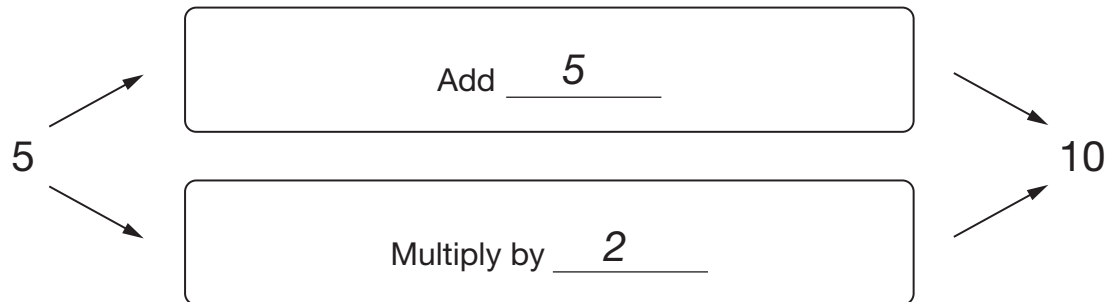
☐ 200mm
 ☐ 200cm
 ☐ 200m
 ☐ 200km

1 mark

☐

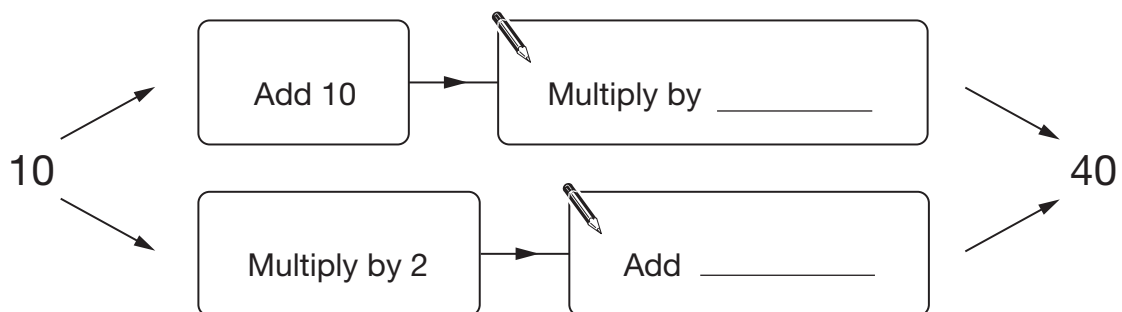
4. Write the missing numbers.

The first pair is done for you.



1 mark

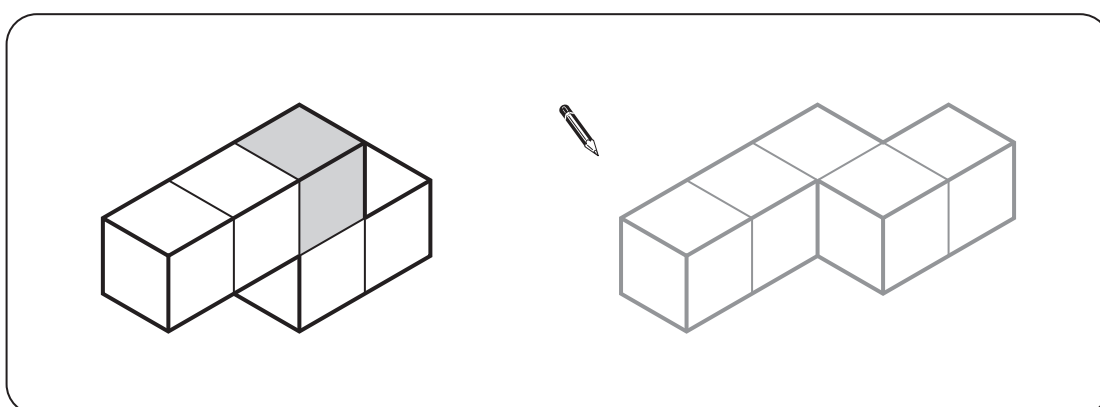
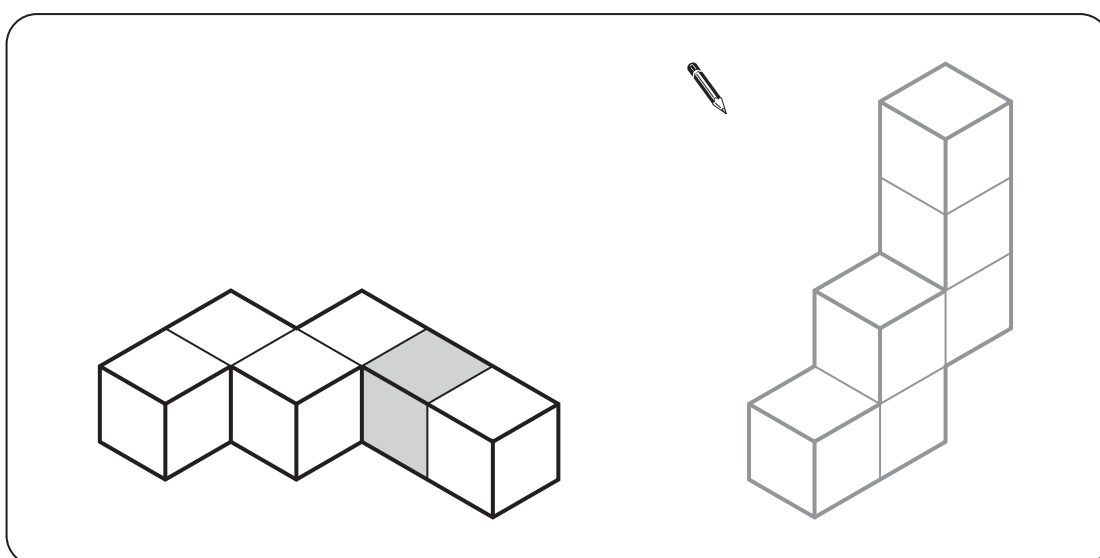
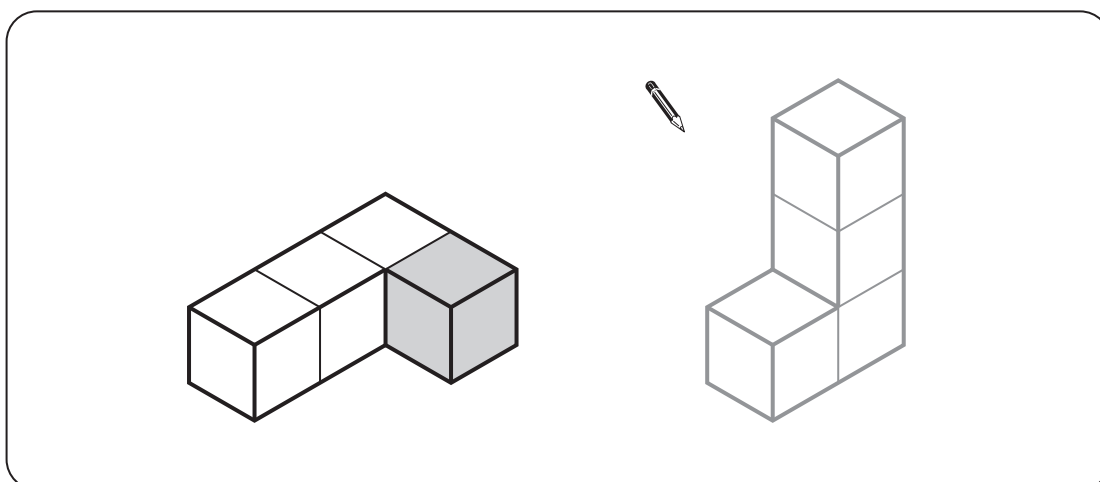
1 mark



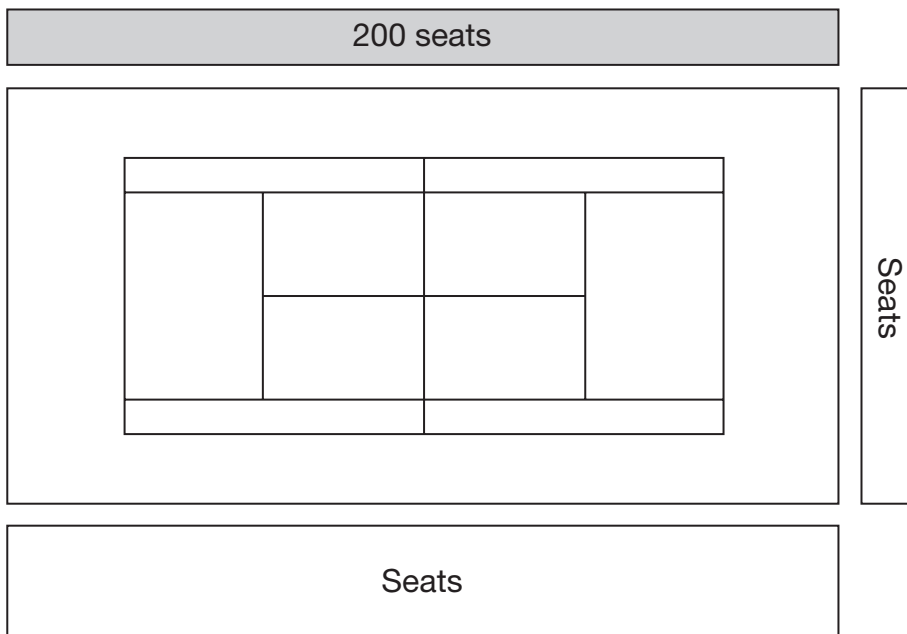
1 mark

1 mark

5. Here are three pairs of shapes made from cubes.
In each pair, **shade one cube** to make the pair the same.



6. This is a tennis court with seats around it.



The shaded area has **200** seats.

What is the approximate **total number** of seats around the tennis court?



_____ seats

2 marks

7. Write a number in each box to make the calculations correct.

 \times $-$ $= 80$

1 mark

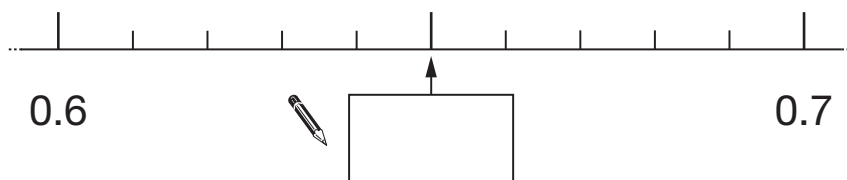
 \times $-$ $= 800$

1 mark

8. Write the missing number on each of these number lines.



1 mark



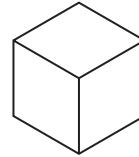
1 mark



9. Ali has a strip of paper and a cube.

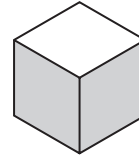


Paper



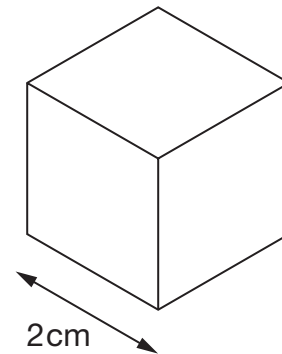
Cube

The paper folds to cover four faces of the cube.

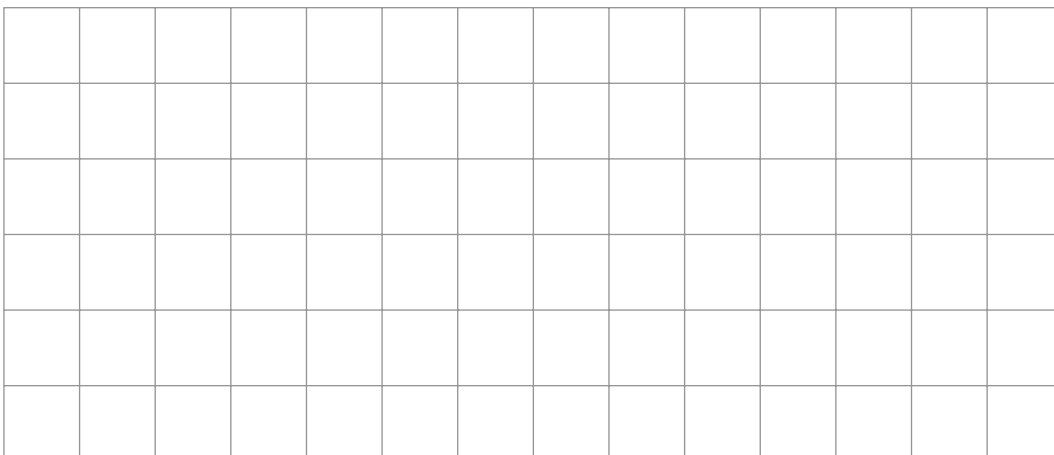


Paper and cube

Ali has a bigger cube of side length 2cm.



Draw **accurately** a strip of paper that will cover **four faces** of this cube.



Centimetre square grid

2 marks

10. The table shows the time difference between the UK and cities around the world.

City	Time difference from the UK (hours)
Hong Kong	+ 8
Dhaka	+ 6
Dubai	+ 4
Harare	+ 2
London	0
Brasilia	– 2
San Juan	– 4
Chicago	– 6
Los Angeles	– 8

- (a) The time difference between Harare and London is 2 hours.

What is the time difference between **Dubai** and **Brasilia**?



_____ hours

1 mark

- (b) Write two cities that have a time difference of **12 hours**.



_____ and _____

1 mark

- (c) Now write a **different** two cities that have a time difference of **12 hours**.



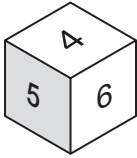
_____ and _____

1 mark

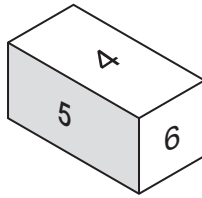


11. Look at these three dice, A, B and C.

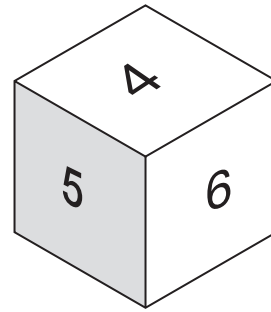
Each dice is numbered 1 to 6



Dice A



Dice B



Dice C

What can you say about the probability of rolling a **5** when you use...

...Dice A



...Dice B



...Dice C



2 marks

12. Here are two equations.

$$a + b = 10$$

$$a - b = 2$$

Write the values of a and b that make **both** equations true.



$a =$ _____ $b =$ _____

1 mark

13. Write the missing information in this table.



Name of shape	Side length	Perimeter
Regular hexagon	8 cm	_____ cm
Regular octagon	_____ cm	56 cm
Regular _____	8 cm	40 cm

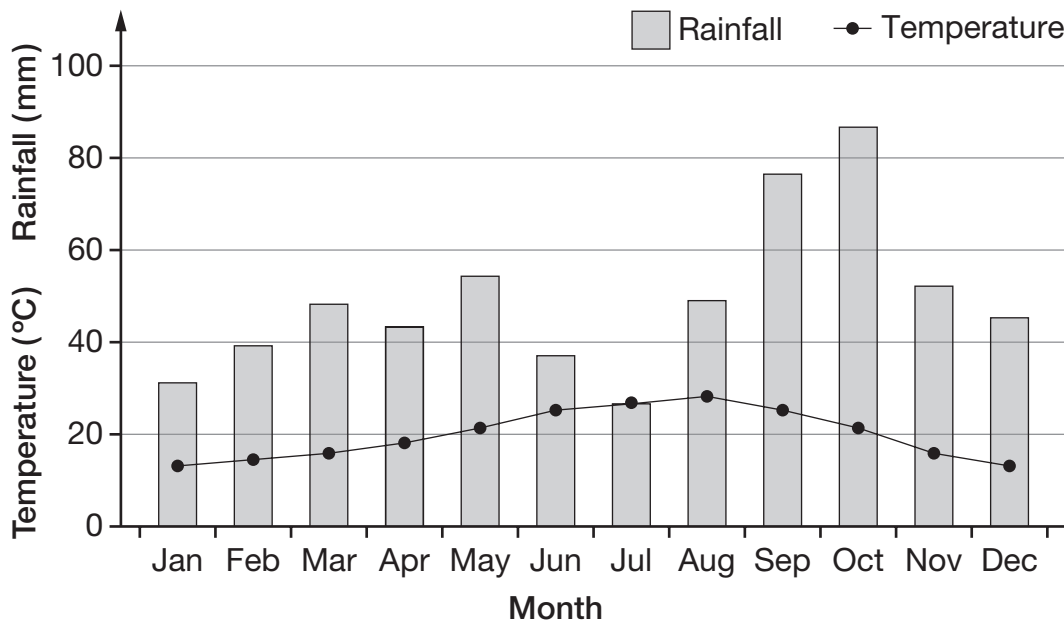
1 mark

1 mark

1 mark



14. This graph shows the average total rainfall and the average maximum daily temperature in Barcelona.



- (a) In which months is the rainfall less than 40mm and the temperature more than 20°C?



1 mark

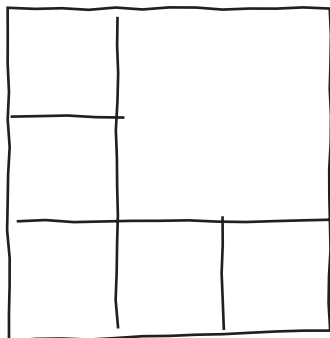
- (b) Compare the weather conditions in May and October.



1 mark

15. Sue wants to split a large square into 6 smaller squares.

She has this sketch showing how to do it.



On the grid below, join dots to make an **accurate** drawing of a large square split into 6 smaller squares.

Use Sue's sketch to help you.



2 marks



16. Here are five numbers.

2


11

5

15


7

(a) Use two of these numbers to make the **smallest** fraction you can.



1 mark

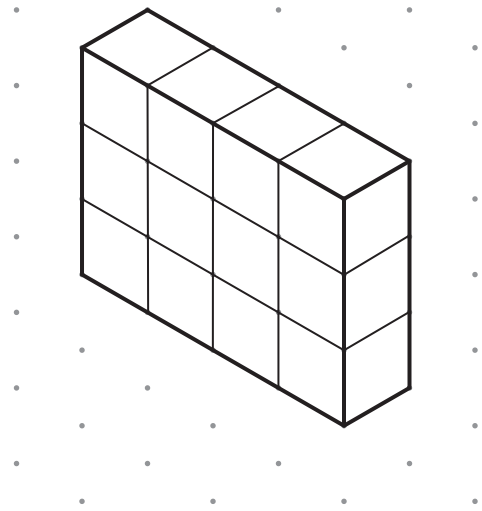
(b) Use **three** of these numbers, and **one other**, not in the list, to make two **equivalent** fractions.



	and	

2 marks

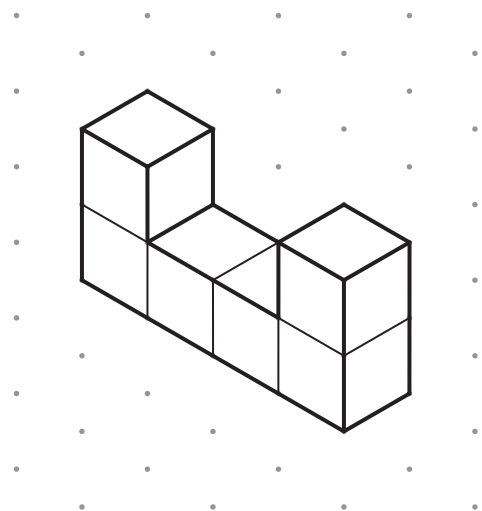
17. The diagram shows a cuboid.



Isometric grid

The cuboid is cut into two pieces.

This diagram shows one of the pieces.



Isometric grid

Draw the other piece on this grid.



Isometric grid

2 marks



18. Mark is going to play a game.

The probability that he will win the game is $\frac{7}{12}$

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

☐

Win

☐

Lose

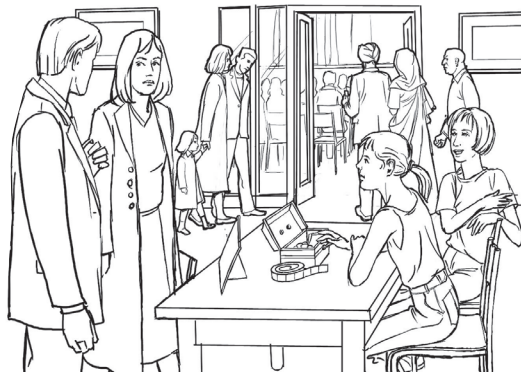
Explain how you know.



1 mark

19. A school held a concert.

Tickets for adults cost more than tickets for children.



Mr and Mrs Evans went to the concert with 3 children.

Their tickets cost **£20.50**

Mr and Mrs Singh went to the concert with 2 children.

Their tickets cost **£17.00**

Work out the cost of one adult ticket and one child ticket.



One adult:

£

One child:

£

2 marks

20. This table shows some students' scores in a mathematics and a science test.

Student	A	B	C	D	E	F	G	H	I	J
Mathematics	29	33	17	44	21	18	30	31	12	18
Science	23	31	15	39	20	18	17	29	13	17

- (a) One of the students was feeling ill during the science test.

Which student is that most likely to be?



Student _____

1 mark

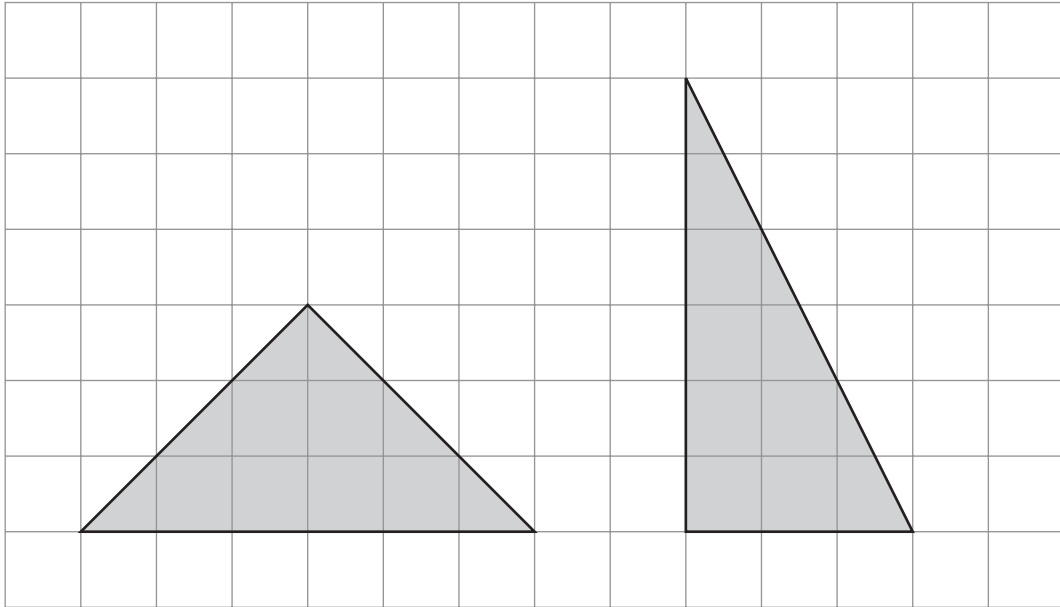
- (b) Another student was absent from the science test, but scored **38** in the mathematics test.

What mark would you expect them to have scored in the science test if they had been able to take it?



2 marks

21. Here are two shaded triangles on a square grid.



Steve says:

The triangles have the same area.

Is he correct?

☐

Yes

☐

No

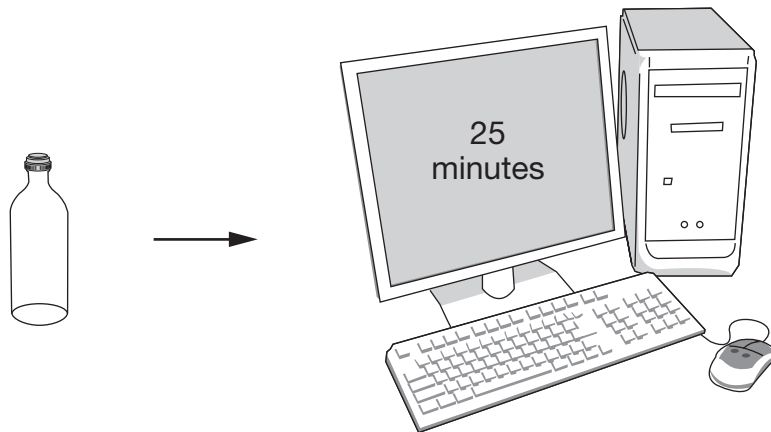
Explain how you know.



1 mark



22. One recycled glass bottle saves enough energy to power a computer for 25 minutes.



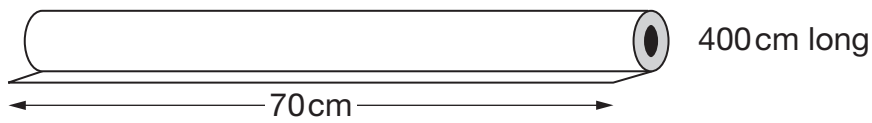
How many recycled glass bottles save enough energy to power a computer for **10 hours**?



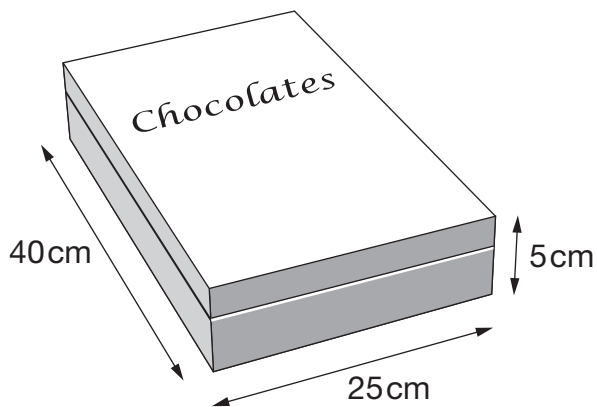
_____ bottles

2 marks

23. I have a roll of wrapping paper...



...and a box of chocolates.



I want to cut a suitable length of paper from the roll to wrap the box.

I don't want to waste paper.

What length of paper should I cut?

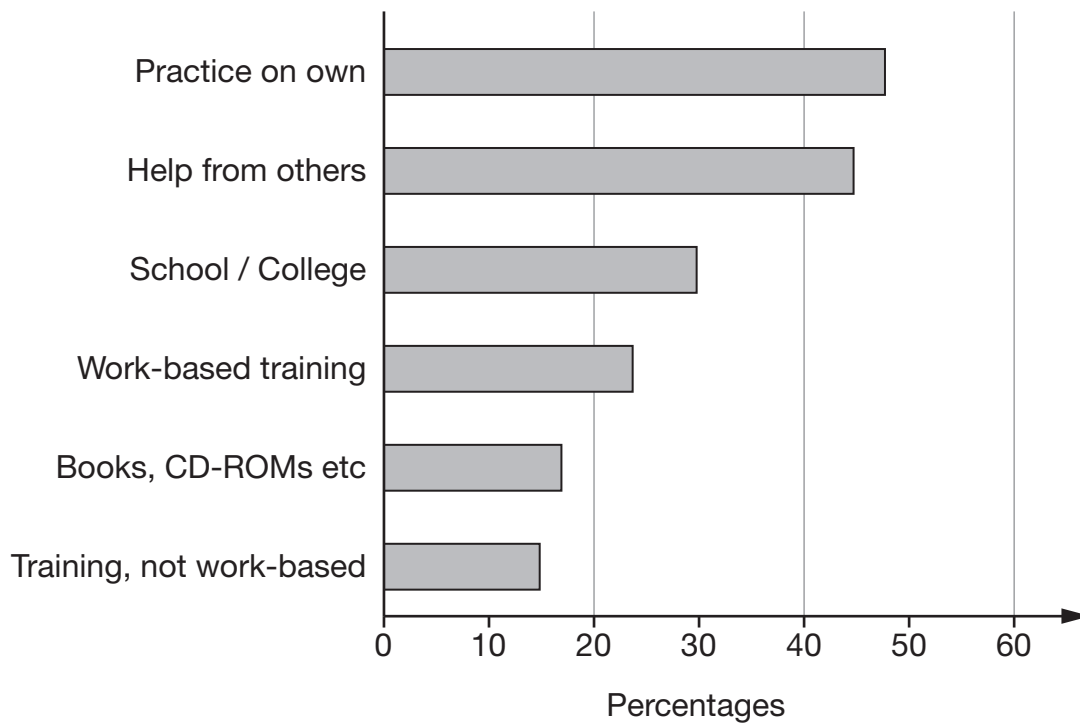


_____ cm

3 marks



24. The graph shows six different ways that adults learn ICT.



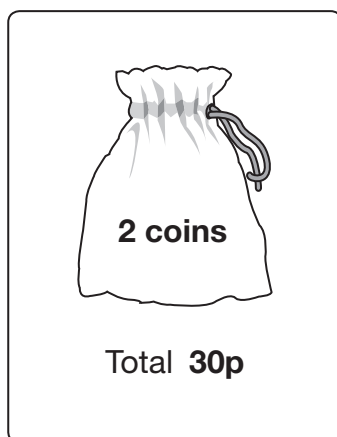
How can you tell from the graph that some adults use **more than one** of these six different ways?



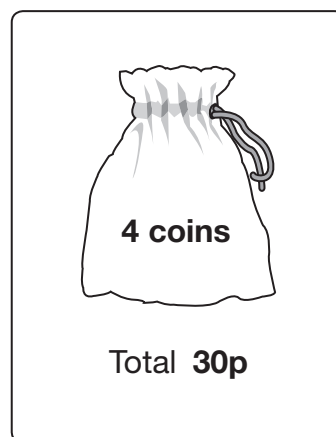
1 mark

25. Anna and Tom each have a small bag of coins.

Anna's bag



Tom's bag



Anna is going to take a coin at random from her bag.

Tom is going to take one at random from his.

Who is most likely to take a **10p coin**?

☐

Anna

☐

Tom

☐

Both equally likely

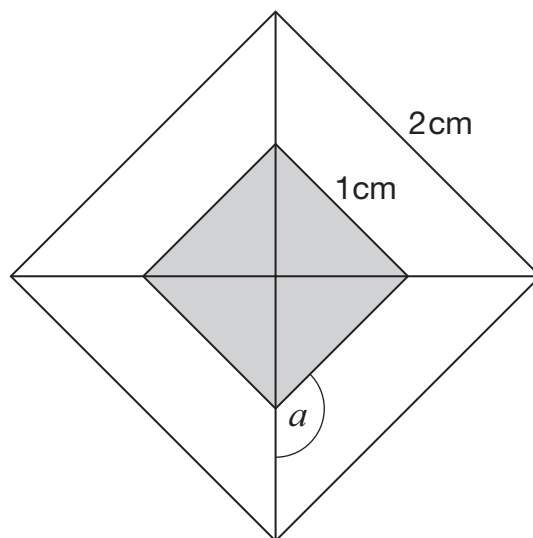
Show working to explain your answer.



2 marks



26. The diagram shows a design made from **two squares** and their diagonals. The squares have side lengths 2cm and 1cm.



Not drawn accurately

- (a) Without measuring, explain why angle a must be 135°



1 mark

- (b) Some of the design is shaded grey. Some is white.
What is the **ratio** of the grey area to the white area?



_____ : _____

1 mark

27. Here are the equations of five straight lines.

$$y = x - 1$$

A

$$y = x + 1$$

B

$$y = x - 2$$

C

$$y = x + 2$$

D

$$y = x$$

E

(a) Which of the five straight lines goes through (0, 0)?

Write its letter.



Straight line _____

Choose one of the other four straight lines.

Complete this sentence.



Straight line _____ goes through (0, _____).

1 mark

(b) Now choose one of the other three straight lines.

Complete this sentence.



Straight line _____ goes through (_____, 0).

1 mark



END OF TEST