

# Ma

KEY STAGE

## 3

TIER

## 4–6

# 2002

# 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 name and the name of your school in the spaces below. If you have been given a pupil number, write that also.

First name \_\_\_\_\_

Last name \_\_\_\_\_

School \_\_\_\_\_

Pupil number

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

#### 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, a pair of compasses 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

Borderline check

|  |
|--|
|  |
|  |

## Instructions

### Answers



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

### Calculators

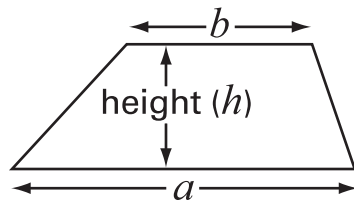


You **may** use a calculator to answer any question in this test.

## Formulae

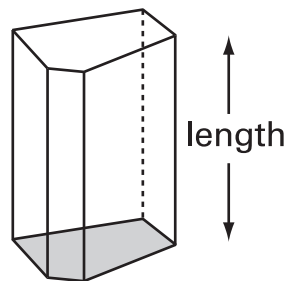
You might need to use these formulae

### Trapezium



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

### Prism



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

1. Some towns and villages have very long names.

The table shows information about the ten longest place names in the UK.

| Number of letters | Country  |
|-------------------|----------|
| 67                | Wales    |
| 58                | Wales    |
| 27                | England  |
| 22                | Wales    |
| 21                | Wales    |
| 21                | Wales    |
| 19                | England  |
| 18                | England  |
| 18                | Scotland |
| 17                | Scotland |

- (a) The longest place name in **Wales** has more letters than the longest place name in **Scotland**.

How many more?



.....

1 mark

- (b) **50%** of the ten longest place names are in Wales.

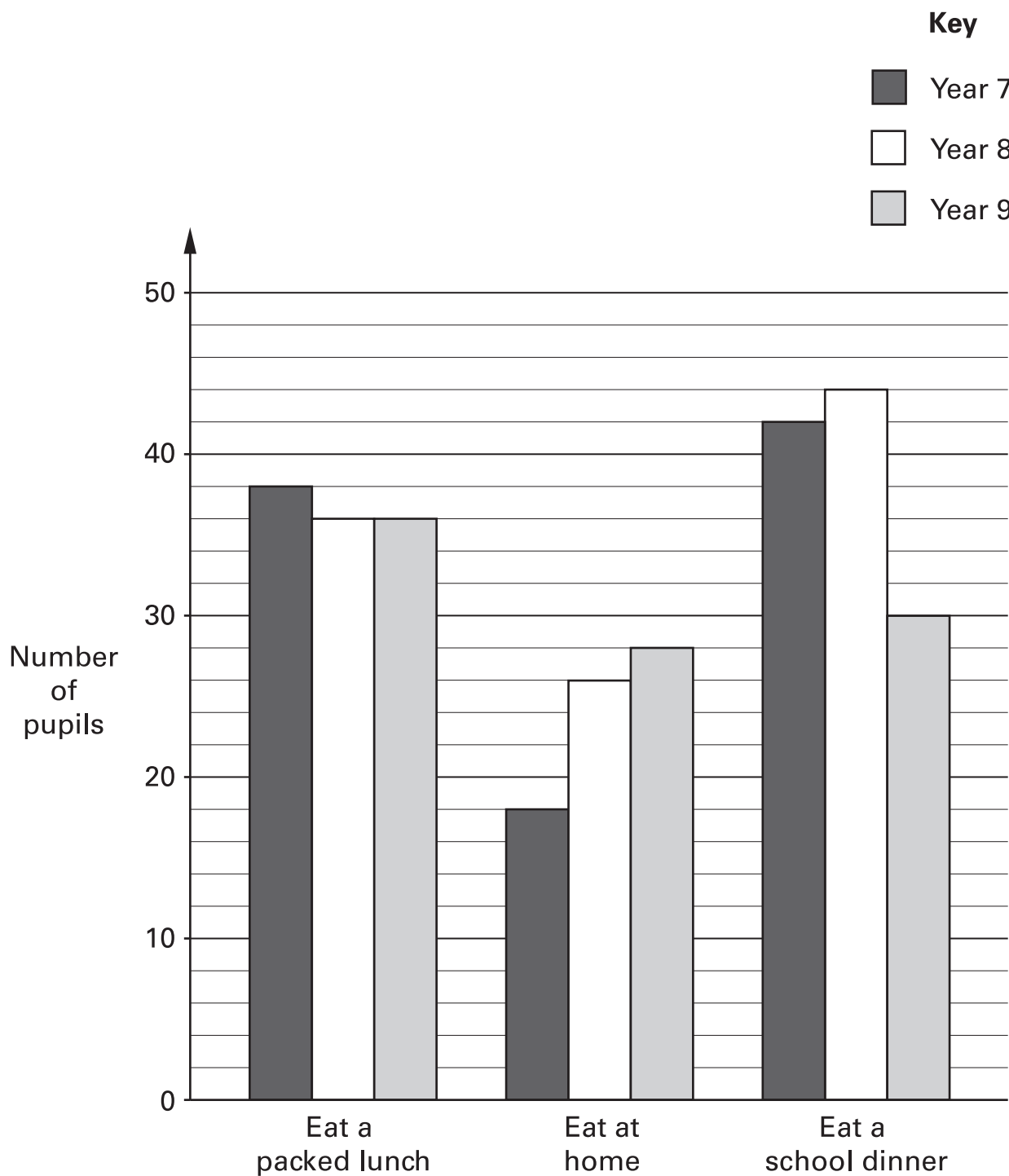
What percentage of the ten longest place names are in **England**?



..... %

1 mark

2. The diagram shows what pupils in years 7, 8 and 9 choose to do at dinner time.



(a) A pupil from each year group is chosen at random.

Are they **most likely** to eat a packed lunch, or eat at home, or eat a school dinner?

Tick (✓) the correct boxes.

|                                                                                                     | Eat a<br>packed<br>lunch | Eat<br>at<br>home        | Eat a<br>school<br>dinner |
|-----------------------------------------------------------------------------------------------------|--------------------------|--------------------------|---------------------------|
|  Pupil from year 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Pupil from year 8                                                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Pupil from year 9                                                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |

.....  
2 marks

(b) How many **more** pupils are there in year **8** than year **9**?

Show your working.



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

3. Here is some information about a school.

There are **3 classes** in **year 8**. Each class has **27 pupils**.

There are **4 classes** in **year 9**. Each class has **25 pupils**.

- (a) Use the information to match each question with the correct calculation.  
The first one is done for you.

| Question                                                                                                                                                   | Calculation                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| How many <b>classes</b> are there altogether in years 8 and 9?                                                                                             | $3 + 4$                         |
|                                                                                                                                                            | $3 - 4$                         |
|                                                                                                                                                            | $4 - 3$                         |
|  There are more <b>classes</b> in year 9 than in year 8. How many more? | $(3 \times 27) + (4 \times 25)$ |
| How many <b>pupils</b> are there altogether in years 8 and 9?                                                                                              | $(3 + 27) + (4 + 25)$           |
|                                                                                                                                                            | $(3 \times 27) - (4 \times 25)$ |
| There are more <b>pupils</b> in year 9 than in year 8. How many more?                                                                                      | $(4 + 25) - (3 + 27)$           |
|                                                                                                                                                            | $(4 \times 25) - (3 \times 27)$ |

1 mark

1 mark

1 mark

- 
- (b) Use the information about the school to write what the missing question could be.

**Question**

**Calculation**



$$4 \times 25$$

1 mark



## 4. I throw a fair coin.

For each statement below, put a tick (✓) to show if the statement is **True** or **False**.

- (a) On **each** throw, the probability of getting a head is  $\frac{1}{2}$



True ☐ False ☐

Explain your answer.



1 mark

- (b) On **four throws**, it is **certain** that I will get two heads and two tails.



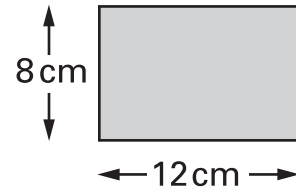
True ☐ False ☐

Explain your answer.



1 mark

5. (a) I have a rectangle made out of paper.  
The rectangle measures 12cm by 8cm.



I want to **fold** the rectangle **in half** to make a smaller rectangle.  
I can do this in two different ways.

What size could the smaller rectangle be? Write both ways.



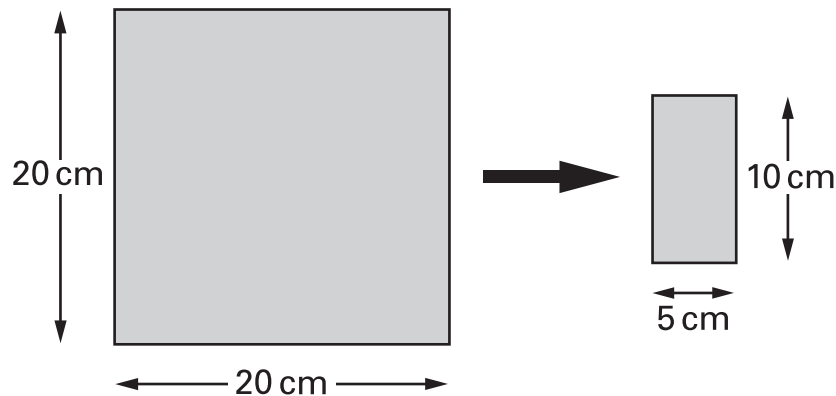
first way: ..... cm by ..... cm

second way: ..... cm by ..... cm

.....

2 marks

- (b) I have a square made out of paper. The square measures 20cm by 20cm.  
I keep folding it in half until I have a rectangle that is 5cm by 10cm.



How many times did I fold it?



.....

1 mark



6. Some people use **yards** to measure length.

The diagram shows one way to change yards to metres.



- (a) Change **100 yards** to metres.



..... metres

1 mark

- (b) Change **100 metres** to yards.  
Show your working.

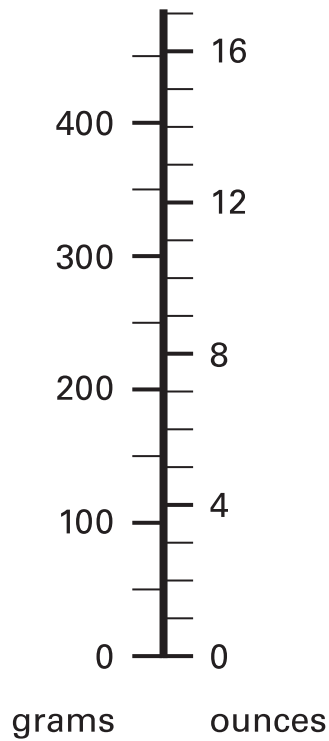


..... yards

.....

2 marks

7. A scale measures in **grams** and in **ounces**.



Use the scale to answer these questions.

- (a) About how many ounces is **400 grams**?



..... ounces

1 mark

- (b) About how many grams is **8 ounces**?



..... grams

1 mark

- (c) About how many ounces is **1 kilogram**?

Explain your answer.



..... ounces

.....

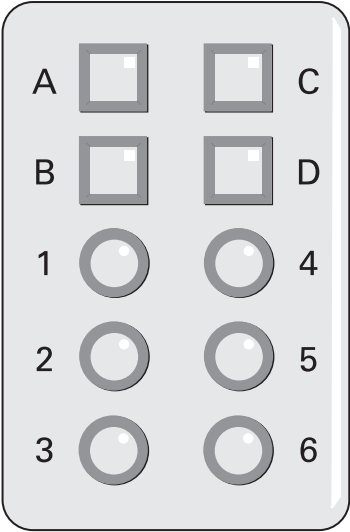
2 marks



8. A door has a security lock.

To open the door you must press the correct buttons.

The code for the door is one letter followed by a single digit number.  
For example: B6



- (a) How many **different** codes are there altogether?  
Show your working.



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

- (b) I know that the correct code begins with D  
I press D, then I guess the single digit number.

What is the probability that I open the door?



1 mark

9. Screenwash is used to clean car windows.  
To use Screenwash you mix it with water.

| Winter mixture                                             |
|------------------------------------------------------------|
| Mix <b>1</b> part Screenwash<br>with <b>4</b> parts water. |

| Summer mixture                                             |
|------------------------------------------------------------|
| Mix <b>1</b> part Screenwash<br>with <b>9</b> parts water. |

- (a) In **winter**, how much water should I mix with **150 ml of Screenwash**?



..... ml

1 mark

- (b) In **summer**, how much Screenwash should I mix with **450 ml of water**?



..... ml

1 mark

- (c) Is this statement correct?

**25% of winter mixture is Screenwash.**

Tick (✓) Yes or No.



Yes

☐

No

☐

Explain your answer.

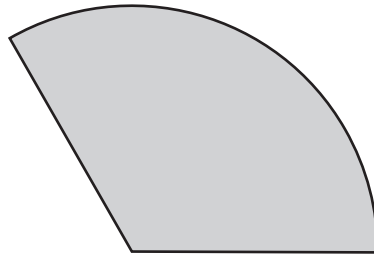


1 mark



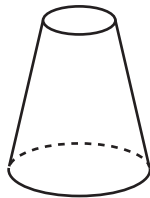
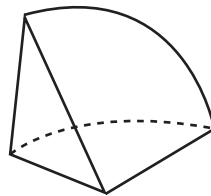
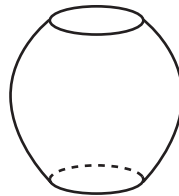
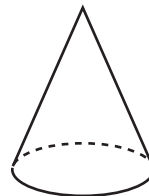
10. (a) I have a paper circle.

Then I cut a sector from the circle. It makes this net.



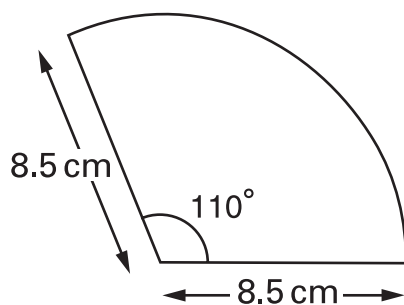
Which 3-D shape below could I make with my net?

Tick (✓) your answer.



1 mark

(b) Here is a sketch of my net.



Not drawn accurately

Make an **accurate drawing** of my net.



. . . . .

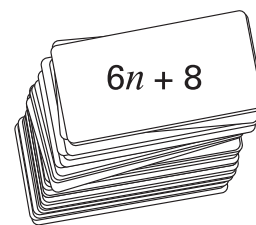
. . . . .

3 marks



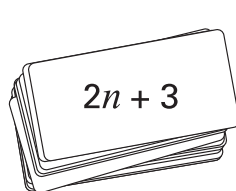
11. A teacher has a large pile of cards.

An expression for the **total** number of cards is  $6n + 8$

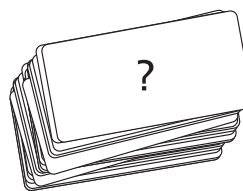


- (a) The teacher puts the cards in two piles.

The number of cards in the first pile is  $2n + 3$



first pile



second pile

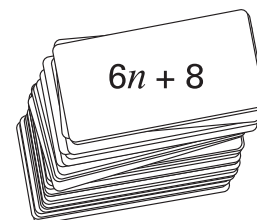
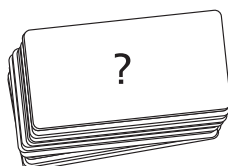
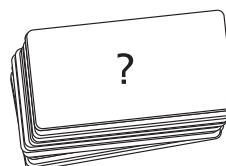
Write an expression to show the number of cards in the second pile.



1 mark

- (b) The teacher puts all the cards together.

Then he uses them to make **two equal piles**.



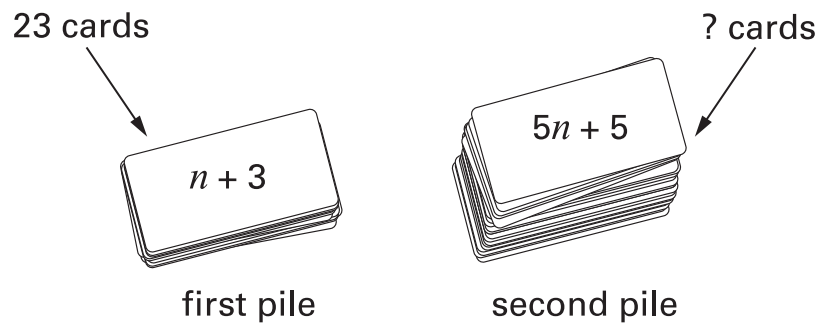
Write an expression to show the number of cards in one of the piles.



1 mark

- (c) The teacher puts all the cards together again,  
then he uses them to make two piles.

There are **23** cards in the first pile.



How many cards are in the second pile?

Show your working.



.....

.....

2 marks



12. Hannah went on a cycling holiday.  
The table shows how far she cycled each day.

| Monday  | Tuesday | Wednesday | Thursday |
|---------|---------|-----------|----------|
| 32.3 km | 38.7 km | 43.5 km   | 45.1 km  |

Hannah says:

‘On average, I cycled **over 40 km** a day’.

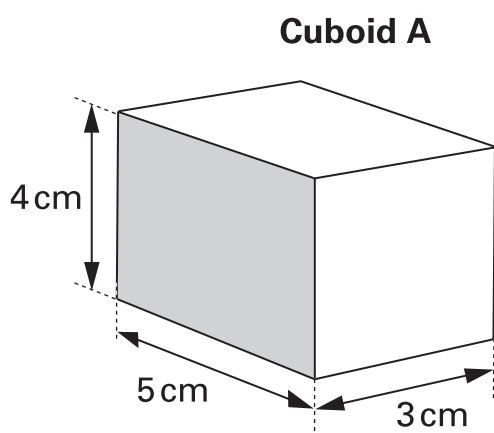
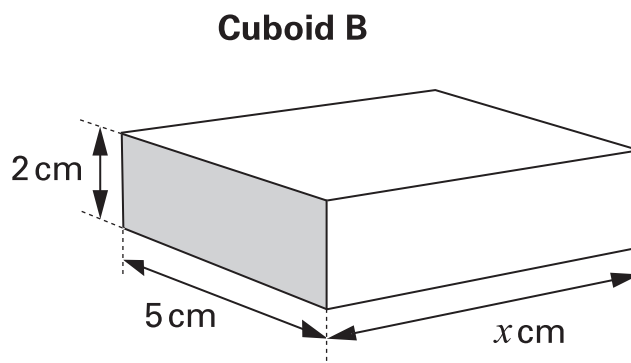
Show that Hannah is wrong.



.....

2 marks

13. The drawing shows 2 cuboids that have the **same volume**.



Not drawn accurately

- (a) What is the volume of cuboid A?  
Remember to state your units.



1 mark

.....

1 mark

- (b) Work out the value of the length marked  $x$

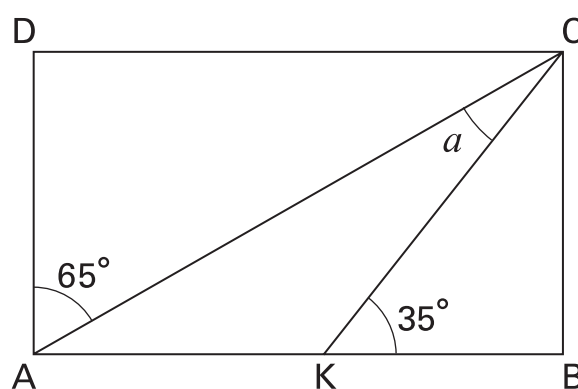


..... cm

1 mark



14. The diagram shows a rectangle.



Not drawn accurately

Work out the size of angle  $a$

You **must** show your working.



$$a = \dots\dots\dots^\circ$$

.....

.....

3 marks

15. A company sells and processes films of two different sizes.  
The tables show how much the company charges.

| Film size: 24 photos           |        |
|--------------------------------|--------|
| Cost to <b>buy</b> each film   | £ 2.15 |
| Postage                        | free   |
| Cost to <b>print</b> each film | £ 0.99 |
| <b>Postage</b> for each film   | 60p    |

| Film size: 36 photos           |        |
|--------------------------------|--------|
| Cost to <b>buy</b> each film   | £ 2.65 |
| Postage                        | free   |
| Cost to <b>print</b> each film | £ 2.89 |
| <b>Postage</b> for each film   | 60p    |

I want to take **360** photos.  
I need to buy the film, pay for the film to be printed,  
and pay for the postage.  
  
Is it cheaper to use all films of size 24 photos, or all films of size 36 photos?  
How much cheaper is it? Show your working.



.....

Use film size: ..... photos

.....

How much cheaper £ 

.....

.....

4 marks

16. Look at the equations.

$$3a + 6b = 24$$

$$2c - d = 3$$

- (a) Use the equations to work out the value of the expressions below.  
The first one is done for you.



$$8c - 4d = 12$$

$$a + 2b = \dots\dots\dots$$

1 mark

$$d - 2c = \dots\dots\dots$$

1 mark

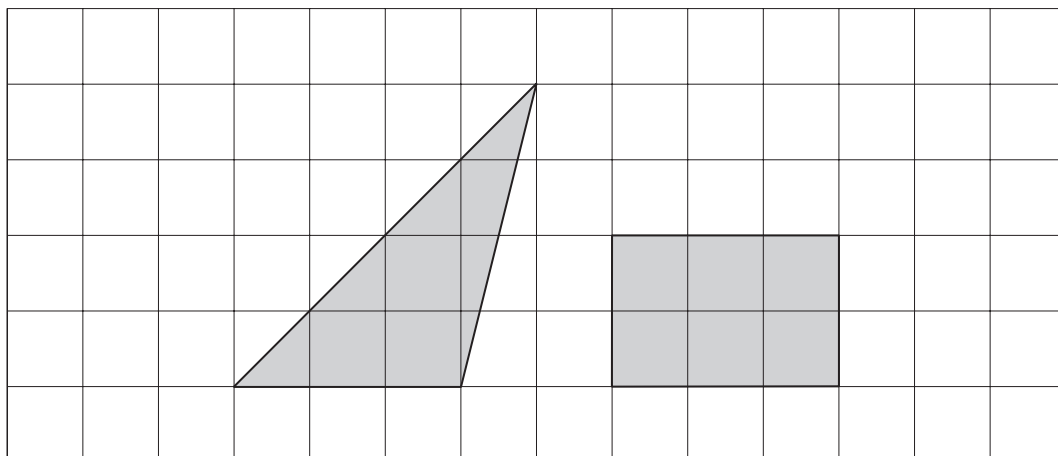
- (b) Use one or both of the equations to write an expression that has a value of **21**



$$\dots\dots\dots = 21$$

1 mark

17. The shapes in this question are drawn on square grids.

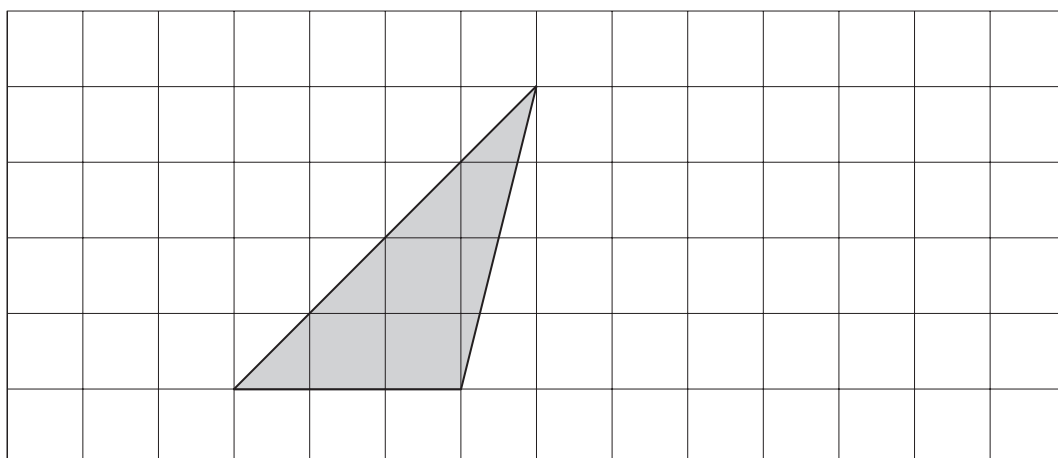


- (a) Show that the triangle and the rectangle have the **same area**.



1 mark

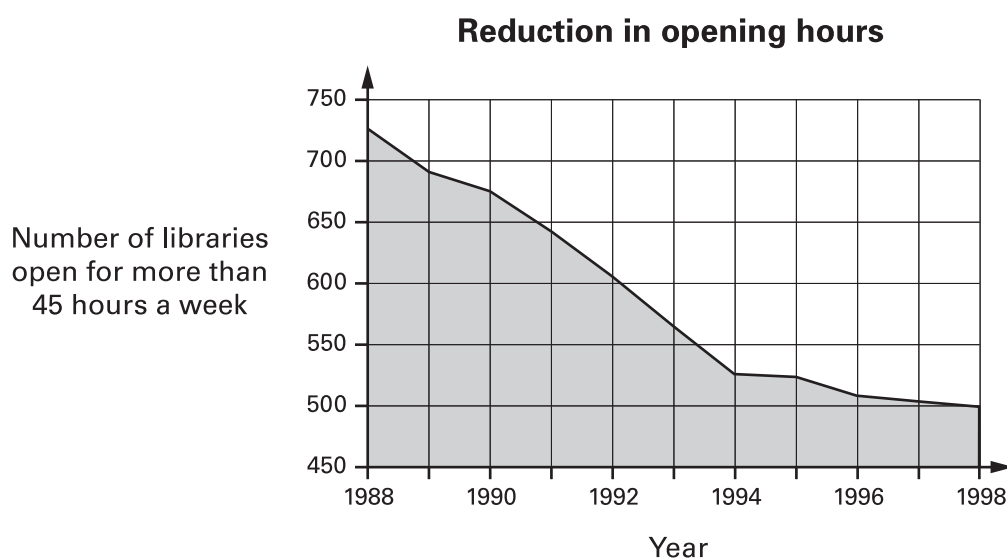
- (b) On the grid below, draw a **parallelogram** that has the same area as the triangle. It must **not** have any right angles.



1 mark



18. A newspaper wrote an article about public libraries in England and Wales. It published this diagram.



**Use the diagram** to decide whether each statement below is true or false, or whether you cannot be certain.

- (a) The number of libraries open for more than 45 hours per week **fell by more than half** from 1988 to 1998.


☐

True

☐

False

☐

Cannot be certain

Explain your answer.



1 mark

- (b) **In 2004** there will be **about 450 libraries** open in England and Wales for more than 45 hours a week.


☐

True

☐

False

☐

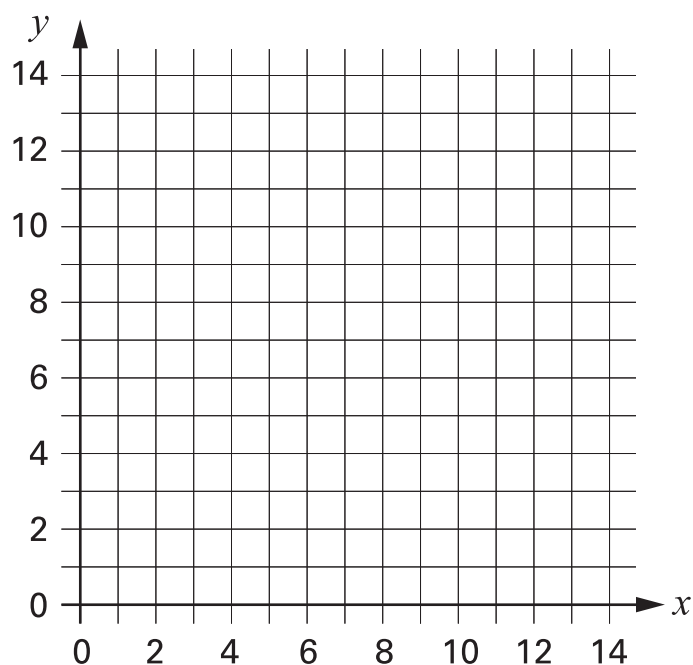
Cannot be certain

Explain your answer.



1 mark

19. Each point on the straight line  $x + y = 12$  has an  $x$  coordinate and a  $y$  coordinate that **add together** to make **12**  
Draw the straight line  $x + y = 12$



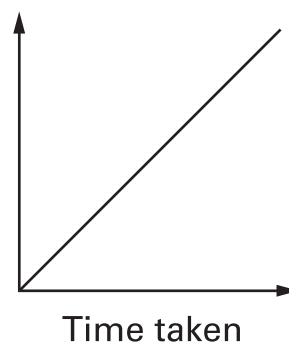
1 mark

Please turn over

20. I went for a walk.

The distance–time graph shows information about my walk.

Distance  
travelled



Tick (✓) the statement below that describes my walk.



I was walking faster and faster.

☐

I was walking slower and slower.

☐

I was walking north-east.

☐

I was walking at a steady speed.

☐

I was walking uphill.

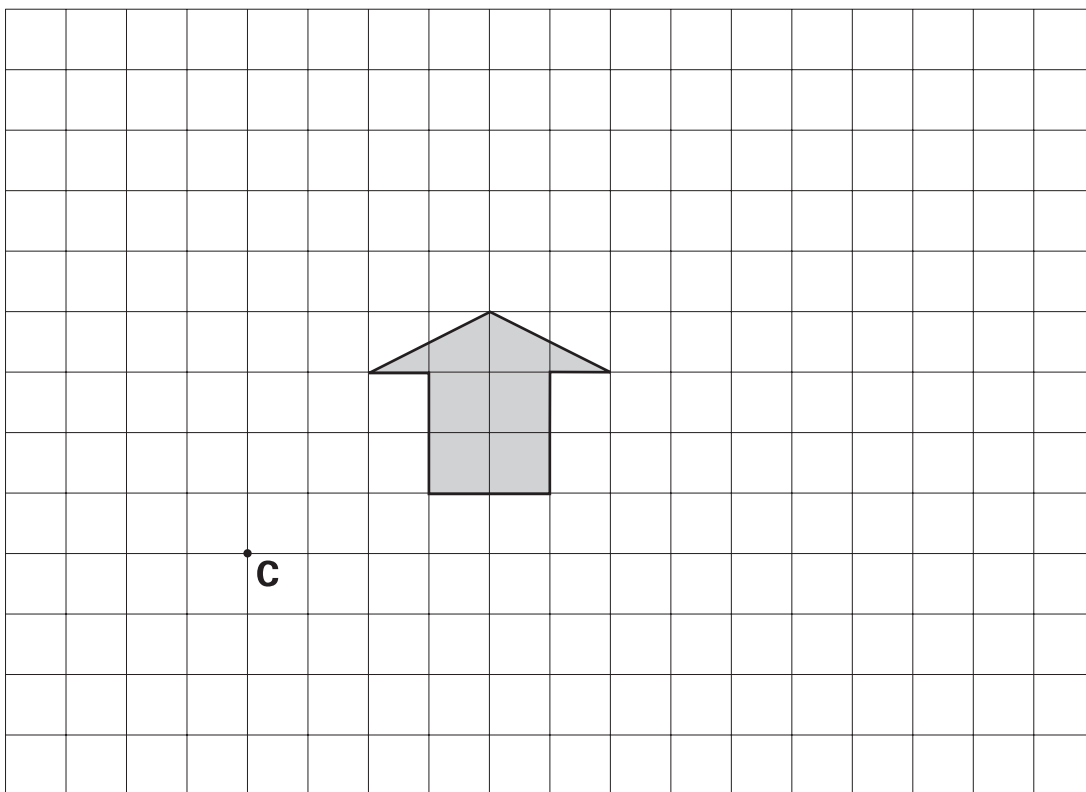
☐

1 mark

21. The grid shows an arrow.

On the grid, draw an **enlargement** of **scale factor 2** of the arrow.

Use **point C** as the centre of enlargement.



. . . .

2 marks

**END OF TEST**