

**Ma**

**KEY STAGE**

**3**

**TIER**

**4–6**

**2004**

# 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.

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

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

School \_\_\_\_\_

#### 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 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 marker's  
use only

Total marks

Borderline check

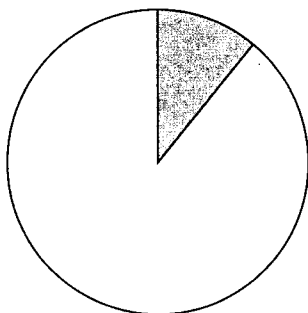
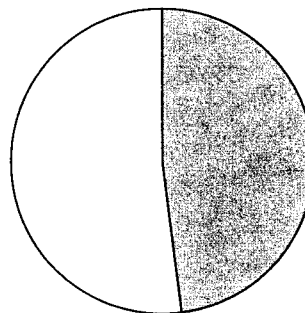
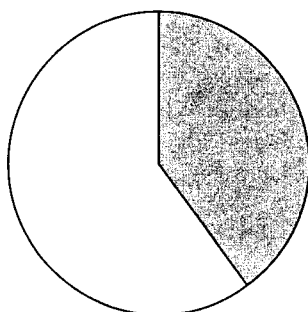
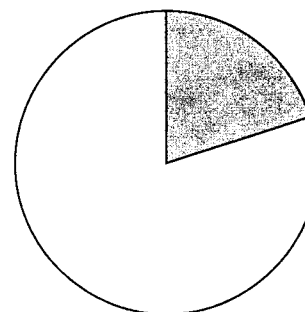
1. The pie charts show what percentage of household rubbish is recycled in different countries.

**Key**

% of rubbish recycled



% of rubbish not recycled

**England****Germany****Norway****Spain**

- (a) In England, about what percentage of rubbish is recycled?



..... %

1 mark

- (b) England wants to recycle **30%** of rubbish by the year 2010.

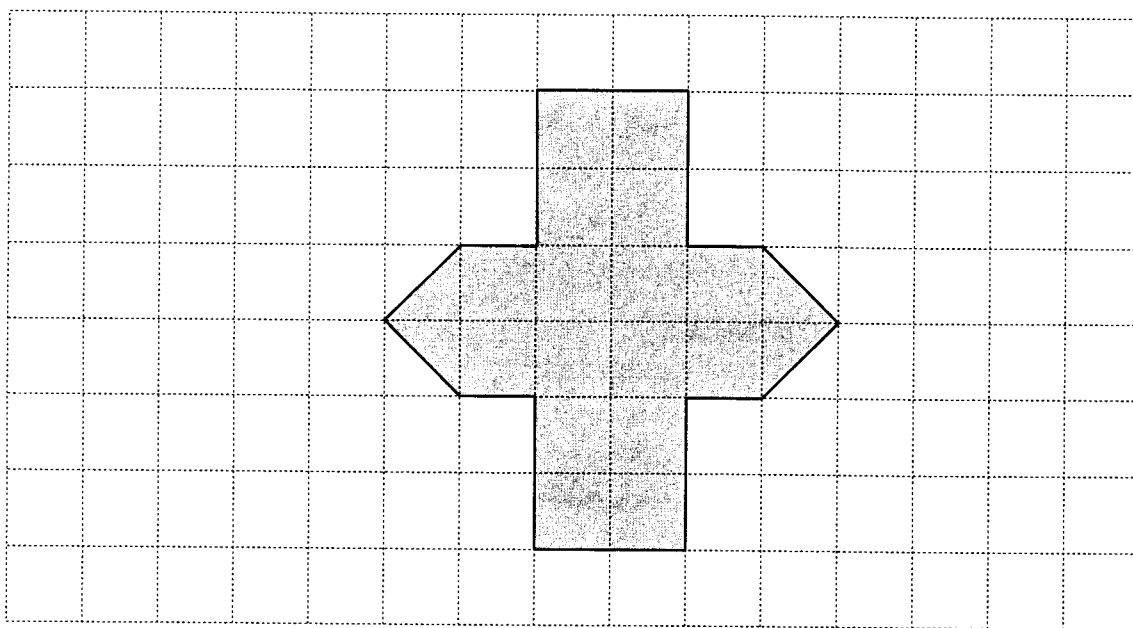
Which countries already recycle more than 30% of their rubbish?



.....

1 mark

2. Here is a shaded shape on a centimetre square grid.



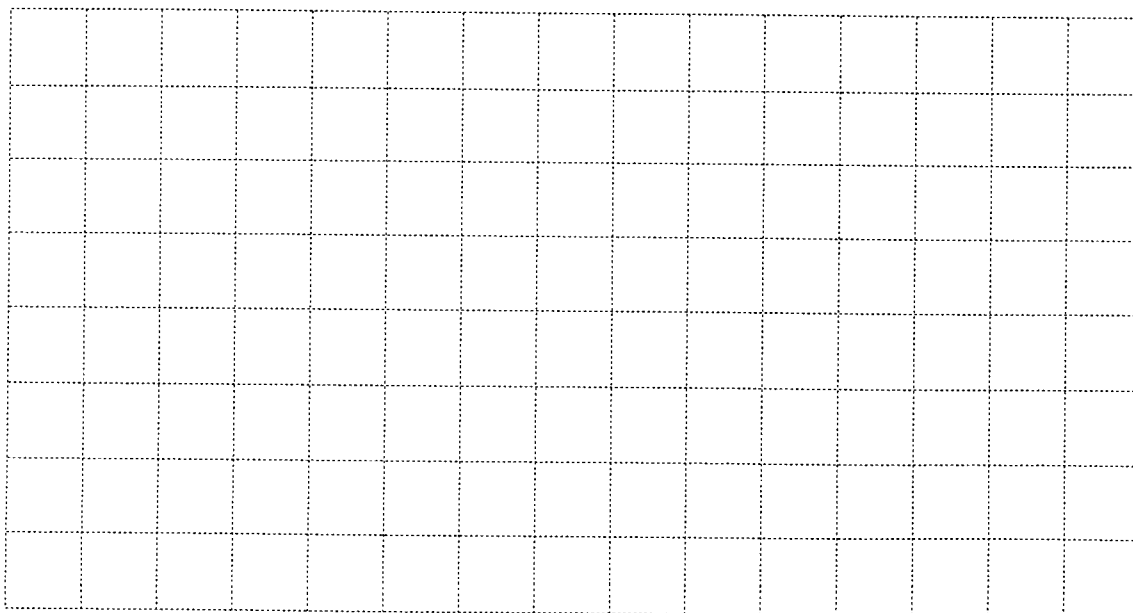
- (a) What is the area of the shaded shape?



.....  $\text{cm}^2$

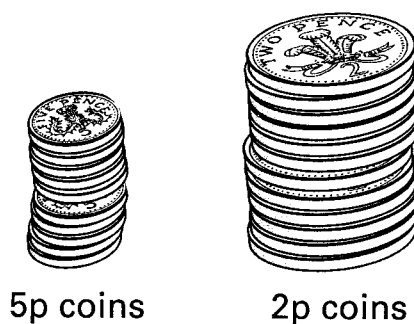
1 mark

- (b) Now draw a **rectangle** that has the **same area** as the shaded shape.



1 mark

3. I have some **5p** coins and some **2p** coins.



I can use some of my coins to make **27p**.

- (a) Complete the table to show different ways to make 27p.

The first way is done for you.

Ways to make 27p		
Use <b>five</b>	5p coins and <i>one</i>	2p coin.
Use <b>three</b>	5p coins and .....	2p coins.
Use <b>one</b>	5p coin and .....	2p coins.

.....  
1 mark

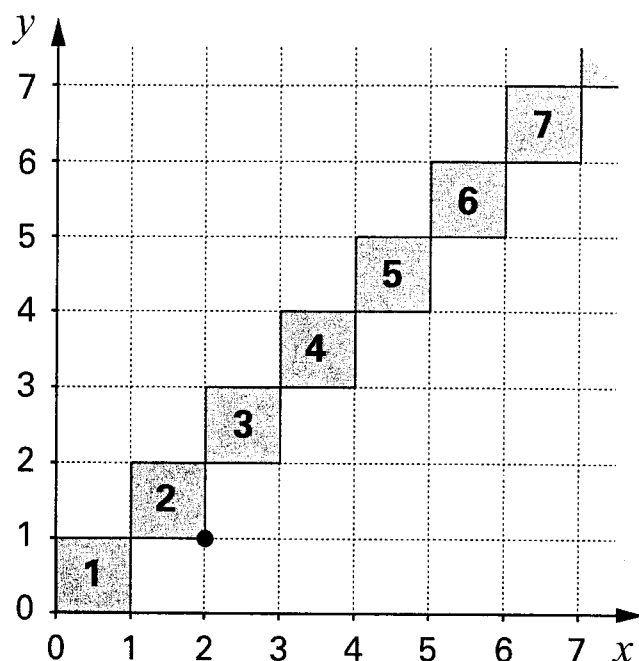
.....  
1 mark

- (b) I cannot make 27p from 5p coins and 2p coins using an **even** number of **5p coins**.

Explain why not.

.....  
1 mark

4. I put square tiles on a large grid so that the tiles touch at the corners.  
The diagram shows part of my diagonal pattern.



- (a) The **bottom right-hand** corner of **tile 2** is marked with a ●  
Write the coordinates of this point.

 (     ,     )

1 mark

- (b) **Tile 4** touches two other tiles.

Write the coordinates of the points where tile 4 touches two other tiles.

 (     ,     ) (     ,     )

1 mark

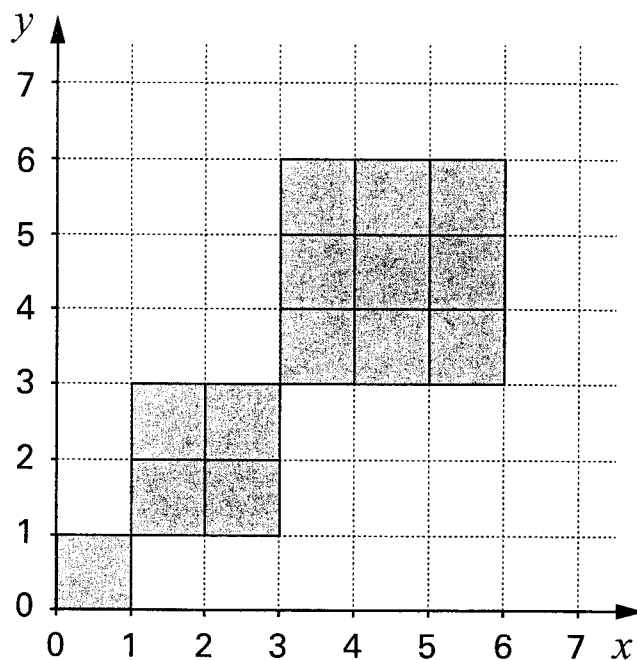
- (c) Write the coordinates of the points where **tile 17** touches two other tiles.

 (     ,     ) (     ,     )

1 mark

(d) I have **30 tiles** to make a pattern on a grid.

The pattern is a series of squares.



I have used some of the 30 tiles to make my pattern.

Do I have enough tiles left to make the **next square**, of side length 4?

Show working to explain your answer.



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



5. Here are the ingredients for a cordial used to make a drink.

50g ginger
1 lemon
1.5 litres of water
900g sugar

- (a) Jenny is going to make this cordial with **25g** of ginger.

How much lemon, water and sugar should she use?

25g ginger
..... lemon
..... litres of water
.....g sugar

.....  
1 mark

.....  
1 mark

.....  
1 mark

- (b) The finished drink should be  $\frac{1}{3}$  **cordial** and  $\frac{2}{3}$  **water**.

Jenny puts **100ml** of cordial in a glass.

How much water should she put with it?



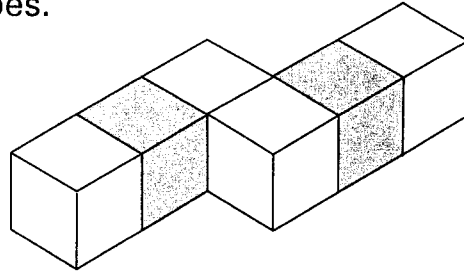
..... ml

.....  
1 mark

6. Look at this shape made from six cubes.

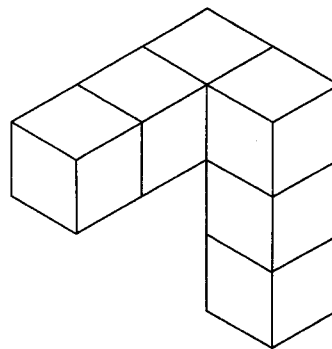
Four cubes are white.

Two cubes are grey.



(a) Part of the shape is rotated through  $90^\circ$  to make the shape below.

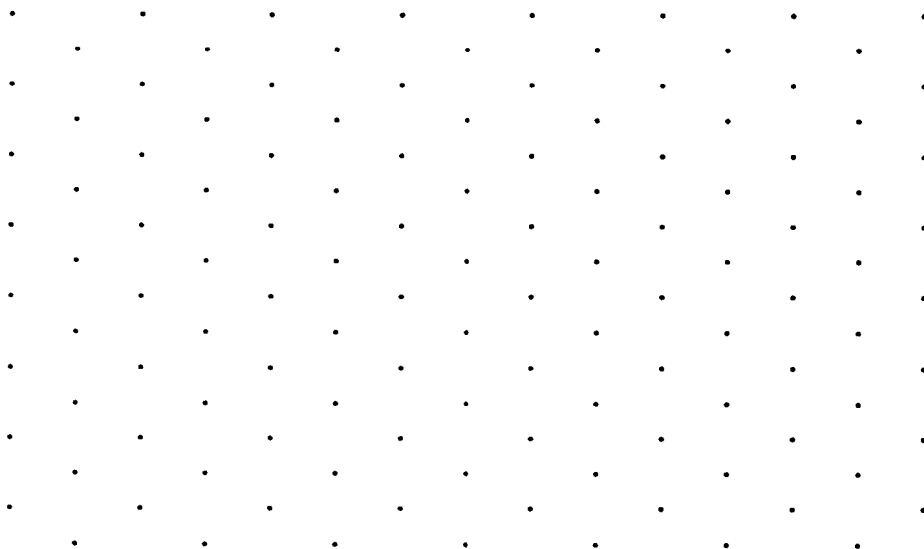
Shade the faces that are grey.



1 mark

(b) After another rotation of  $90^\circ$ , the shape is a cuboid.

Draw this cuboid on the grid below.



2 marks

Isometric grid






7. (a) For each number in the table, write a **multiple** of that number.

Each multiple **must** be between 100 and 130

The first one is done for you.



Number	Multiple between 100 and 130
40	120
35	
27	

1 mark

1 mark

- (b) Is 7 a **factor** of 140?

Tick (✓) Yes or No.


☐

Yes

☐

No

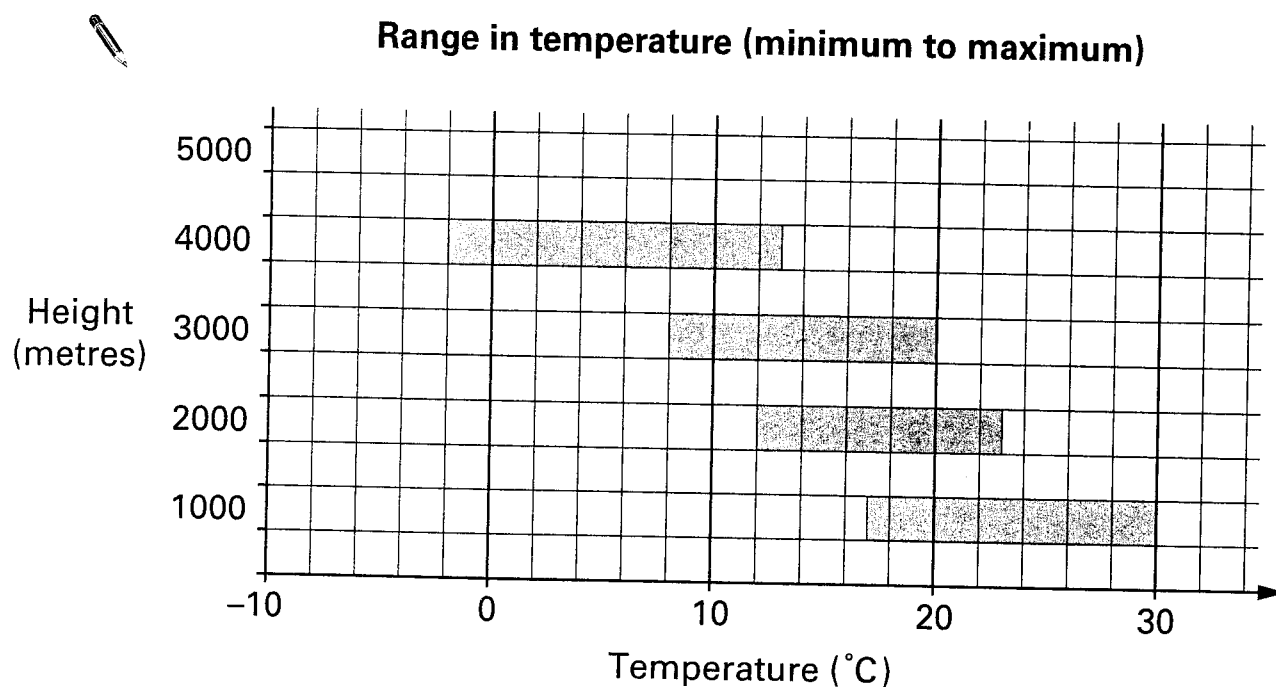
Explain your answer.



1 mark

8. There are high mountains in Nepal.  
At different heights, the temperature is different.

The graph shows information about temperatures in one month.



For example:

At 1000 metres, the maximum temperature is 30°C.

- (a) At **3000** metres, what is the **minimum** temperature?



.....°C

1 mark

- (b) At **5000** metres, the minimum temperature is **-3°C**.

The **range** in temperature is **15°C**.

On the graph above, draw a bar to show this information.

2 marks

9. (a) A pupil measured the angles in a triangle.

She said:

The angles are  $30^\circ$ ,  $60^\circ$  and  $100^\circ$

Could she be correct? Tick (✓) Yes or No.


☐

Yes

☐

No

Explain your answer.

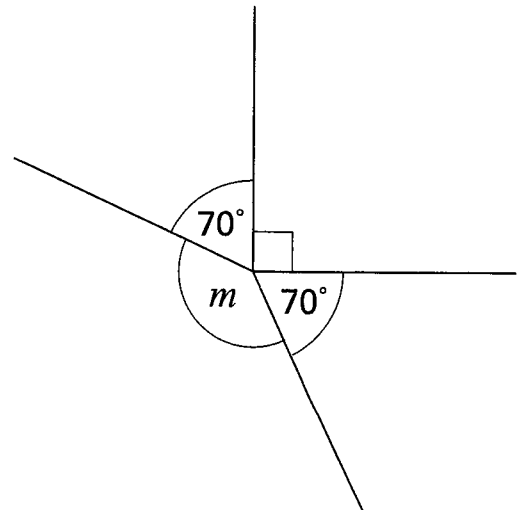


1 mark

- (b) This diagram is not drawn accurately.

Calculate the size of angle  $m$

Show your working.

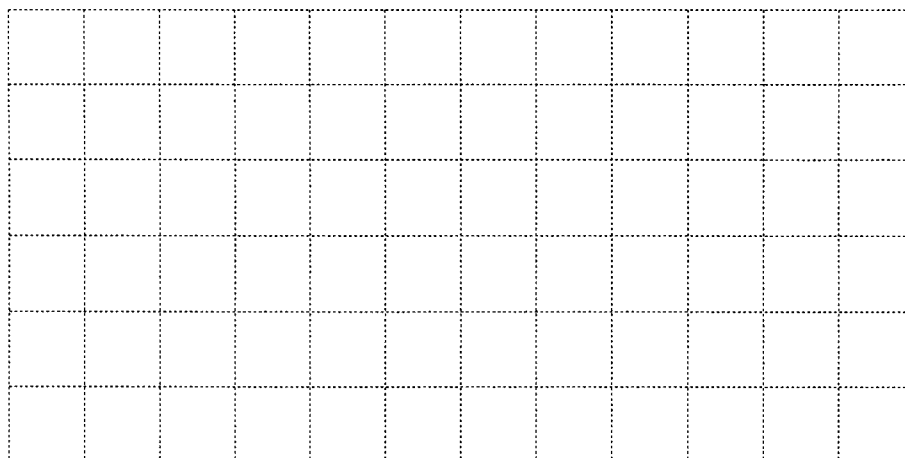


2 marks

10. The square grid below shows a **quadrilateral** that has **four right angles**.

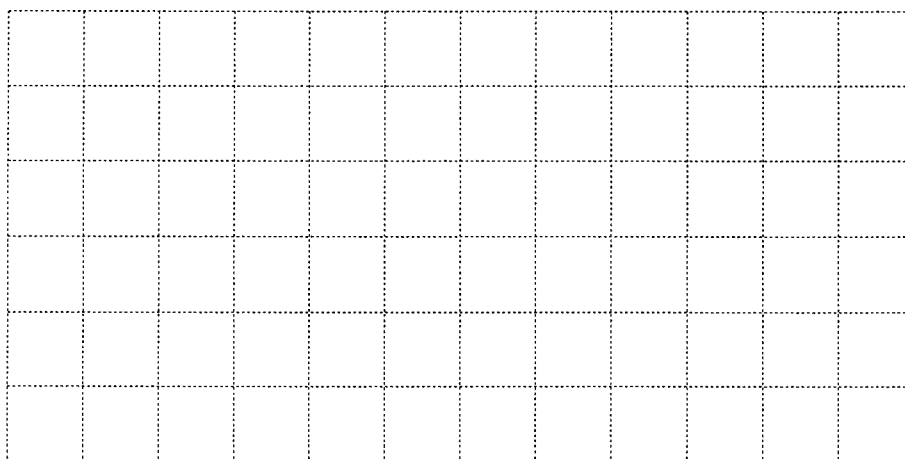


- (a) Draw a quadrilateral that has exactly **two** right angles.



1 mark

- (b) Draw a quadrilateral that has exactly **one** right angle.



1 mark



11. The diagram shows part of a number grid. The grid has 6 columns.  
All the **prime numbers** in the grid are **circled**.

43	44	45	46	47	48
37	38	39	40	41	42
31	32	33	34	35	36
25	26	27	28	29	30
19	20	21	22	23	24
13	14	15	16	17	18
7	8	9	10	11	12
1	2	3	4	5	6

↑  
column X
↑  
column Y

- (a) 35 is not circled.

Explain why 35 is **not** a prime number.



1 mark

(b) There are no prime numbers circled in column Y.

Explain how you know there will **never** be a prime number in column Y.



1 mark

(c) There is one prime number circled in column X.

Explain how you know there will **never** be another prime number in column X.



1 mark

12. A box contains bags of crisps.  
Each bag of crisps weighs **25 grams**.

Altogether, the bags of crisps inside the box weigh **1 kilogram**.



How many bags of crisps are inside the box?



.....

1 mark



13. Shoe sizes in Britain and Germany are different.

The rule below shows how to change a British shoe size to a German shoe size.

**Multiply** the British shoe size by **1.25**,  
then **add 32**,  
then **round** the answer to the nearest whole number.

Tom's British shoe size is **7**, Karl's British shoe size is  **$7\frac{1}{2}$**

They say:

'The rule shows that we have the same **German** shoe size'.

Are they correct? Tick (✓) Yes or No.

☐

Yes

☐

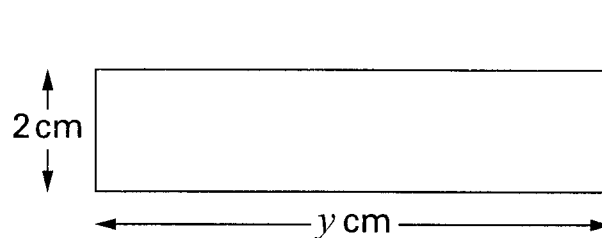
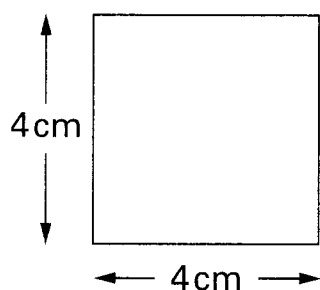
No

Show working to explain your answer.



3 marks

14. (a) The square and the rectangle below have the **same area**.



Not drawn accurately

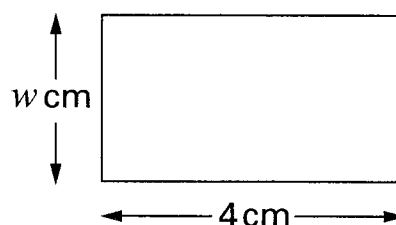
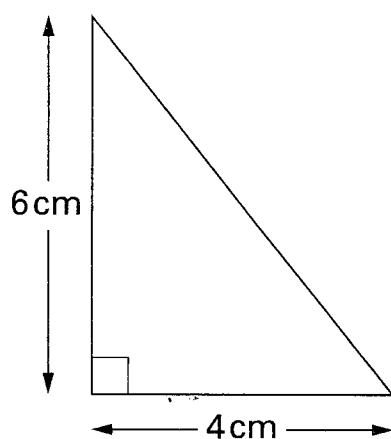
Work out the value of  $y$



$$y = \dots\dots\dots \text{ cm}$$

.....  
1 mark

- (b) The triangle and the rectangle below have the **same area**.



Not drawn accurately

Work out the value of  $w$

Show your working.



$$w = \dots\dots\dots \text{ cm}$$

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





15. (a) In 1976 the average yearly wage was **£3275**

On average, people spent **17%** of £3275 on their family holiday.

How much is 17% of £3275?

Show your working.



£

2 marks

(b) In 2001 the average yearly wage was **£21842**

On average, people spent **£1644** on their family holiday.

What percentage of the average yearly wage is that?

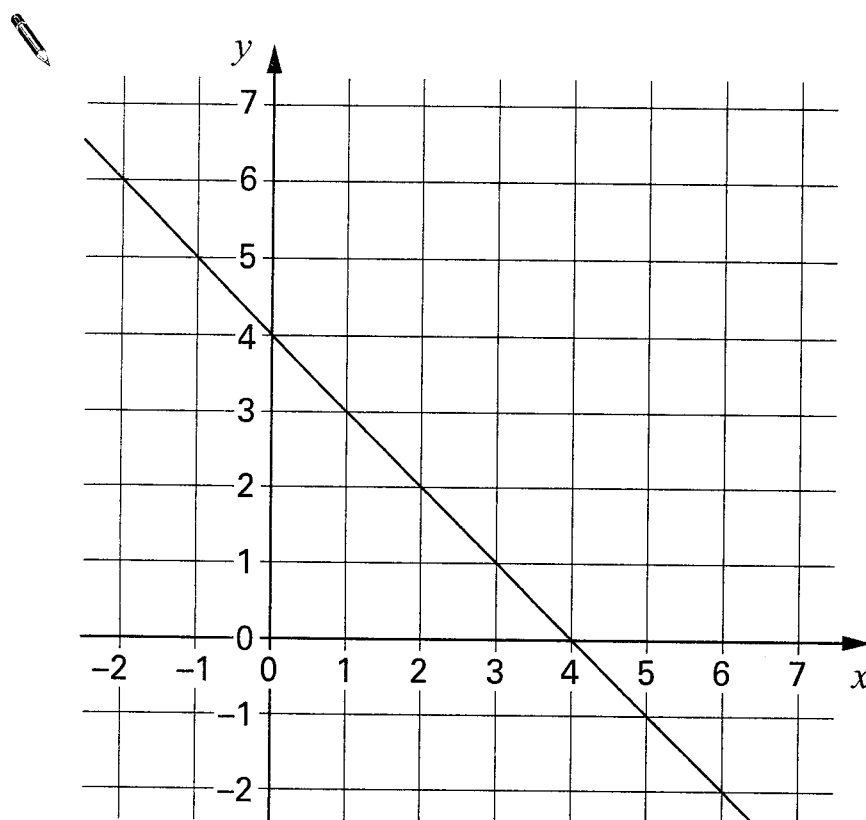
Show your working.



..... %

2 marks

16. The graph shows a straight line.



- (a) Fill in the table for some of the points on the line.

$(x, y)$	(   ,   )	(   ,   )	(   ,   )
$x + y$			

1 mark

- (b) Write an equation of the straight line.



.....

1 mark

- (c) On the graph, draw the straight line that has the equation  $x + y = 6$

1 mark

17.

There are **20 questions** in a quiz.  
A **correct** answer scores **2 points**. An **incorrect** answer **loses 1 point**.  
A question not answered scores 0 points. A negative total is possible.

(a) What are the maximum and minimum points you could get on the quiz?



maximum ..... minimum .....

1 mark

(b) A pupil answers **10** of the 20 questions.  
**8 are correct.**

How many points does he score?



.....

1 mark

(c) Complete the table to show 3 different ways to score **24 points**.



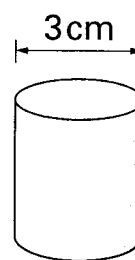
Number of answers that are correct	Number of answers that are incorrect	Number of questions that are not answered
12	0	8

2 marks

18. (a) The cross-section of a cylindrical cotton reel is a circle.

The **diameter** of this circle is **3 cm**.

What is the **circumference** of this circle?



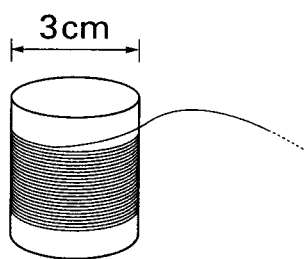
..... cm

.....  
1 mark

- (b) **91 metres** of cotton goes round the cotton reel.

About how many times does the cotton go round the reel?

Show your working, and give your answer to the **nearest ten**.



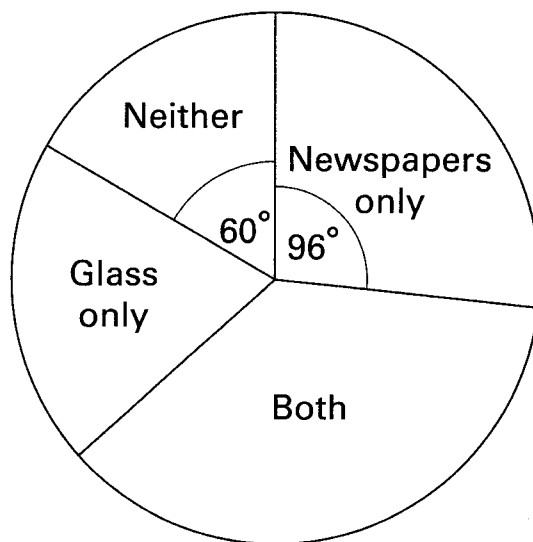
.....

.....  
2 marks



19. (a) A teacher asked her pupils if they recycled newspapers and glass.

The pie chart shows the results.



5 pupils answered 'Neither'.

How many pupils answered 'Newspapers only'?

Show your working.



..... pupils

.....  
2 marks

---

(b) The teacher asked a **different class** if they recycled newspapers and glass.

There were **24 pupils** in the class.

**9 pupils** answered 'Newspapers only'.

On a pie chart, what would the angle be for the sector 'Newspapers only'?

Show your working.



.....  
o

.....

.....  
2 marks

**TURN OVER FOR QUESTION 20**



20. Doctors sometimes use this formula to calculate how much medicine to give a child.

$$c = \frac{ay}{12 + y}$$

$c$  is the correct amount for a child, in ml

$a$  is the amount for an adult, in ml

$y$  is the age of the child, in years

A child who is **4 years old** needs some medicine.

The amount for an adult is **20ml**.

Use the formula to work out the correct amount for this child.

You **must** show your working.



.....

.....

.....  
2 marks

**END OF TEST**