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Ma

KEY STAGE
3

LEVELS
4–6

Year 7 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 **must not** use a calculator for any question in this test.
- You will need a pen, pencil, rubber and ruler. You may find tracing paper useful.
- Some formulas you might need are on page 2.
- This test starts with easier questions.
- Try to answer all of the questions.
- Write all of 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.

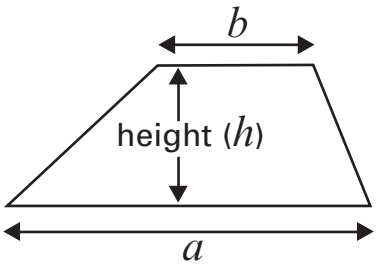
Calculators

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

Formulas

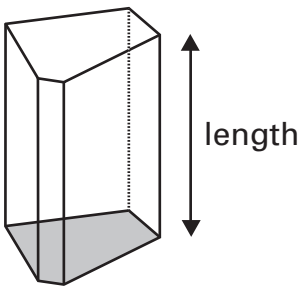
You might need to use these formulas.

Trapezium



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

Prism

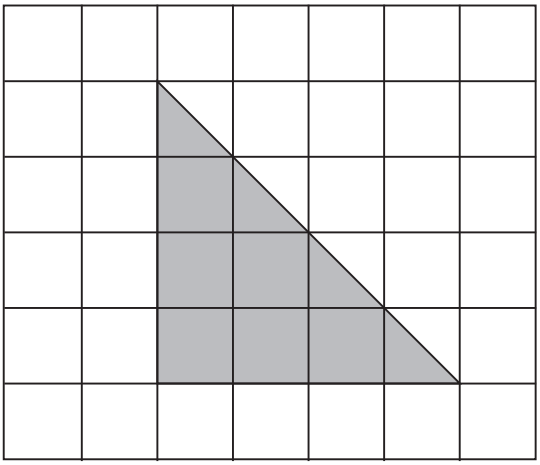


Volume = area of cross-section × length

1 These shapes are drawn on centimetre square grids.

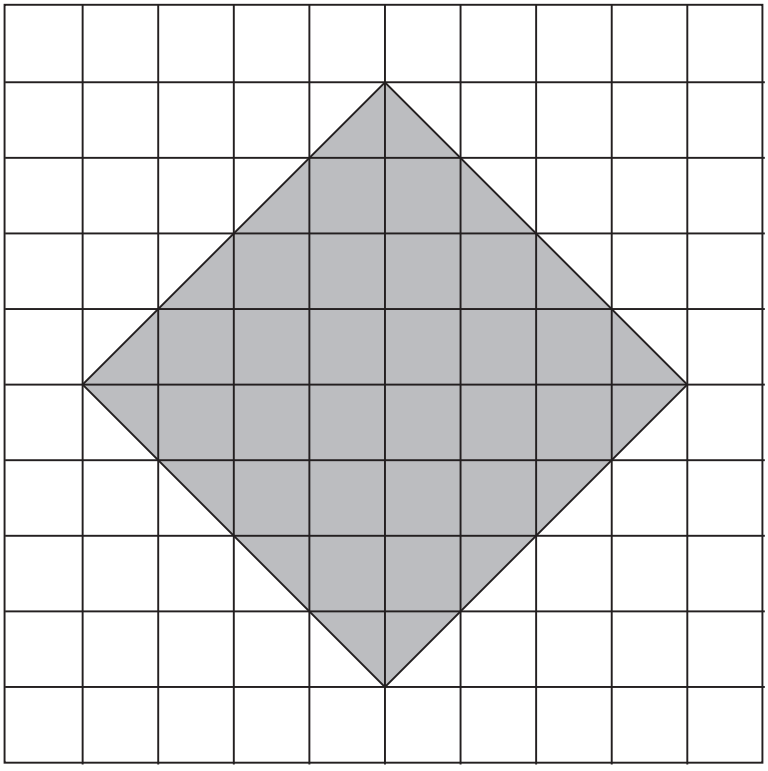
Write the area of each shape.

(a)



Area of the shaded triangle: . . . . . cm^2 . . . .
1 mark

(b)



Area of the shaded square: . . . . . cm^2 . . . .
1 mark

2 Leo buys pasta for **12** people.

(a) Each person eats 100 grams of pasta.
One packet has 500 grams of pasta.
How many packets must Leo buy?

....
1 mark

(b) This is Leo's recipe for pasta sauce.

*Serves **four** people*

300 millilitres milk
200 grams cheese
25 grams butter
$\frac{1}{4}$ cup flour

He makes the sauce for **12** people.
How much of each ingredient does Leo need?

..... millilitres milk

..... grams cheese

..... grams butter

..... cup flour

....
2 marks

3 (a) Here are some number chains that start with 2 and 5

Write the next number in each of these number chains.

Two are done for you.

Rule: Add 3

Rule: Multiply by $2\frac{1}{2}$

Rule: Multiply by 2, then add 1

Rule: Square, then add 1

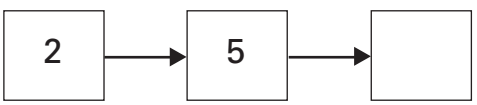
. . . .
1 mark

(b) Make your own number chain that starts with 2 and 5

You must multiply by a number and subtract a number.

Rule: Multiply by . . . . . , then subtract . . . . . .

. . . .
1 mark



. . . .
1 mark

4 This table shows how many pupils brought each number of cans for recycling.

Number of cans	1	2	3	4	5	6	7	8	9
Number of pupils	2	3	1	5	6	2	3	0	2

(a) Complete the table below to summarise the information above.

Number of cans	1 to 3	4 to 6	7 to 9
Number of pupils	6		

1 mark

(b) Jon said:

Most pupils brought between 1 and 3 cans.

Is Jon correct?

Tick (✓) Yes or No.

☐ Yes ☐ No

Explain your answer.

1 mark

(c) Kerstin said:

The group who brought 4 cans each recycled more in total than the group who brought 9 cans each.

Is Kerstin correct?

Tick (✓) Yes or No.

☐ Yes ☐ No

Explain your answer.

. . . . .

1 mark

5 Fill in the missing numbers.

The first is done for you.

42 × 100 = 4200

42 × ..... = 4200000

42 × ..... = 42

42 × ..... = 4.2

. . . .

. . . .

2 marks

6

Apples 15p each

Bananas 45p each

Mia has 60 pence.

She does not have to spend it all.

Complete the table to show what fruit she could buy.

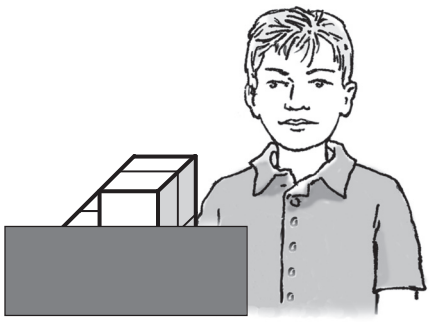
Apples	Bananas
4	0
0	1
0	0

. . . .

. . . .

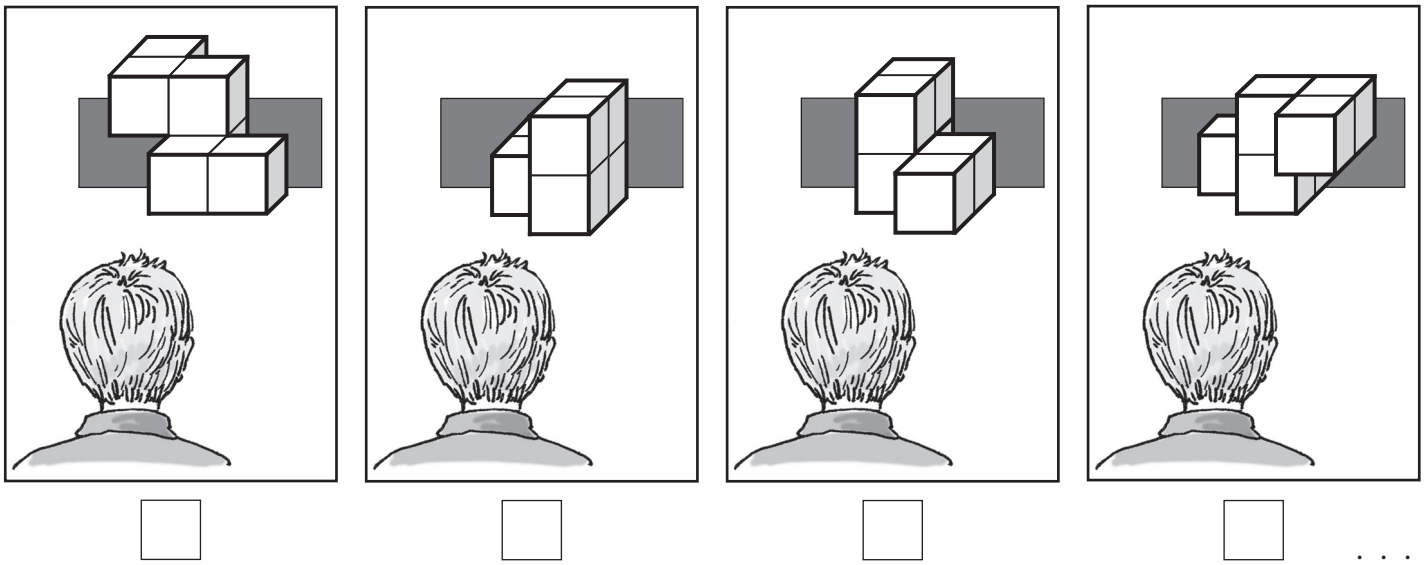
2 marks

7 Jay looked at a 3D shape behind a screen.



One of these is the shape Jay saw.

Tick (✓) the correct shape.



. . . .

1 mark

8 This table shows the amount of time that different animals spend sleeping.

Animal	Average sleep time (per day)
bat	19.9 hours
lion	13.5 hours
cat	12.1 hours
dog	10.6 hours
seal	6.2 hours
cow	3.9 hours
sheep	3.8 hours
horse	2.9 hours
giraffe	1.9 hours

(a) A lion sleeps for 13.5 hours a day.

What is this in hours and minutes?

..... hours ..... minutes

1 mark

(b) Which animal sleeps for **twice** as long as a giraffe?

.....

1 mark

(c) A human spends about **one third** of his or her life asleep.

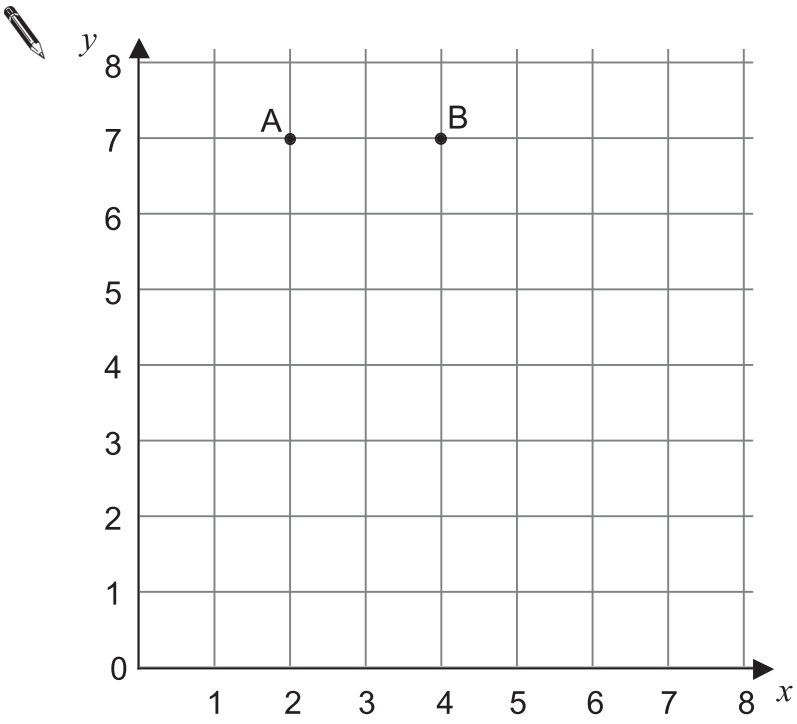
Where should the human go in the table?

Between the ..... and the .....

1 mark

9 Owen starts to draw a quadrilateral ABCD.

He plots the points A and B.



(a) What are the co-ordinates of the point B?

(. . . . . , ...) . . . .
1 mark

(b) Plot the point C at (4, 2). . . . .
1 mark

(c) Owen's quadrilateral has two lines of symmetry.

Plot the point D, then draw Owen's quadrilateral. . . . .
1 mark

10 There was a vote to decide where to have the Olympic Games in 2012.

There were 4 rounds of voting.

After each round the city with the smallest number of votes was removed.

London won.

The table shows the results.

	London	Paris	Madrid	New York	Moscow
first round	22	21	20	19	15
second round	27	25	32	16	
third round	39	33	31		
fourth round	54	50			

(a) 104 people voted in the fourth round.

How many people voted in the first round?

. . . . . .

1 mark

(b) In how many of the 4 rounds did London have more votes than any other city?

Put a ring around your answer.

in none of them in 1 of them in 2 of them

in 3 of them in all of them

1 mark

(c) Alex says:

'All the 54 people who voted for London in the **fourth** round also voted for London in the **third** round.'

Could Alex be correct?

Tick (✓) Yes or No.

☐ Yes ☐ No

Use the information in the table to explain your answer.

. . . . .

1 mark

---

11 Write +, −, ×, or ÷ in each space to make this equation correct.

Find two different ways to do it.

You may use each sign more than once each time.

4 . . . . . 3 . . . . . 2 . . . . . 1 = 10

4 . . . . . 3 . . . . . 2 . . . . . 1 = 10

. . . . .

1 mark

12 This table shows the total area of some different countries, and the area that is covered in forest.

Country	Total area (thousand km^2)	Area covered in forest (thousand km^2)
Australia	7682	1545
Canada	9221	2446
China	9327	1635
Finland	305	219
Latvia	62	30
UK	242	28

(a) Which country has the largest area covered in forest?

.... 1 mark

(b) Which country has **more than half** of its total area covered in forest?

.... 1 mark

(c) About what percentage of Latvia is covered in forest?

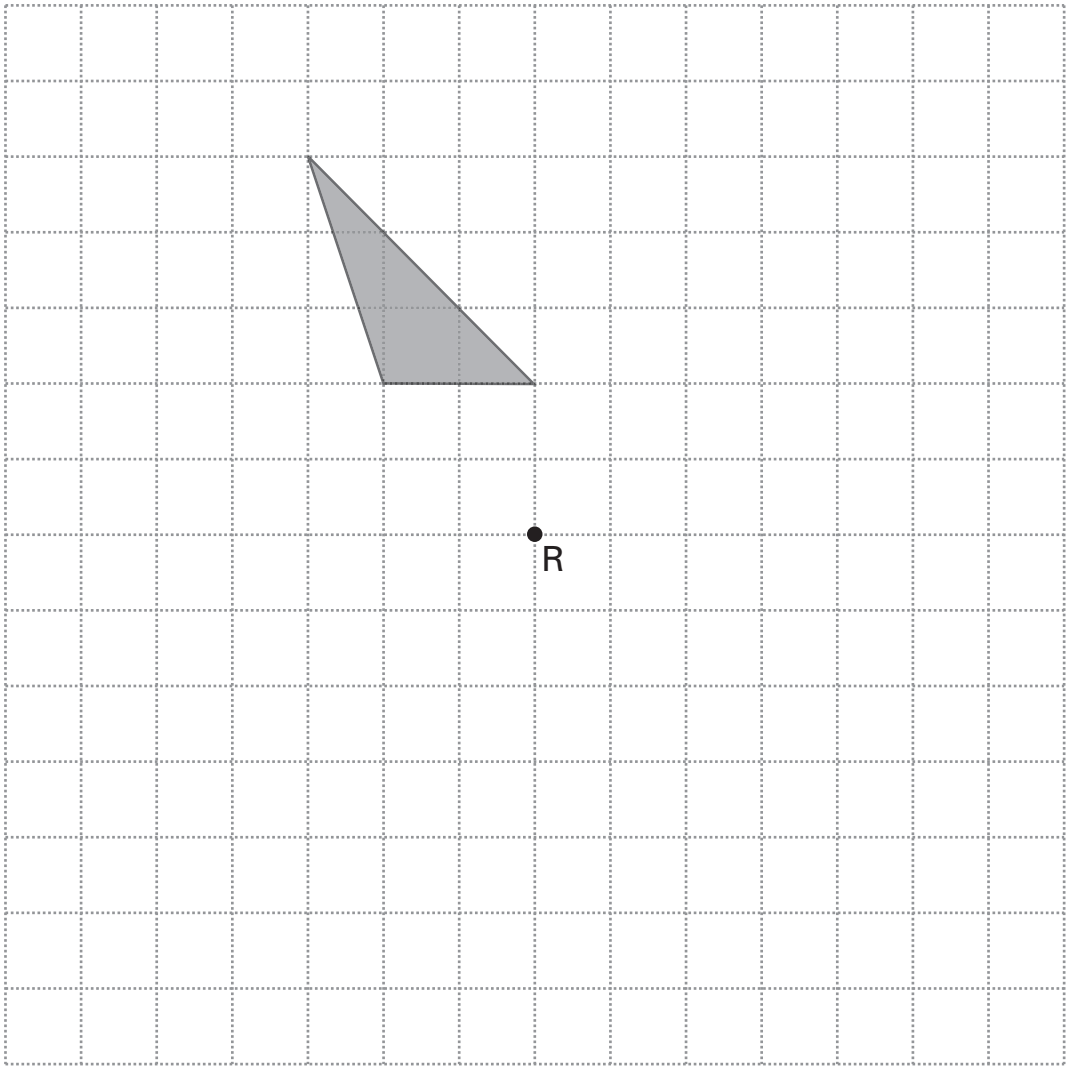
Give your answer to the nearest 10%

..... % .... 1 mark

13 Look at the triangle on the square grid.

Rotate it **90° anticlockwise** around the point R.

Draw the triangle in its new position.



. . . .

. . . .

2 marks

14 David and Anna have these cards.

1	2	3	5	6	7

(a) David uses four of the cards to make a **pair of equivalent fractions**.

Write numbers in the boxes to show how David can do this.

$$\frac{\square}{\square} = \frac{\square}{\square}$$

1 mark

(b) Anna has the same cards.

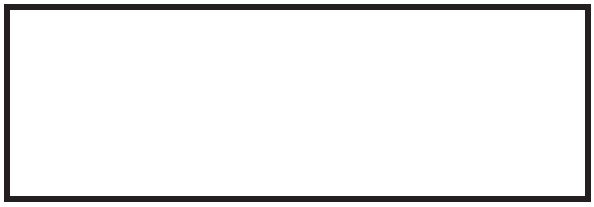
She uses four of the cards to make a **different pair of equivalent fractions**.

Write numbers in the boxes to show how Anna can do this.

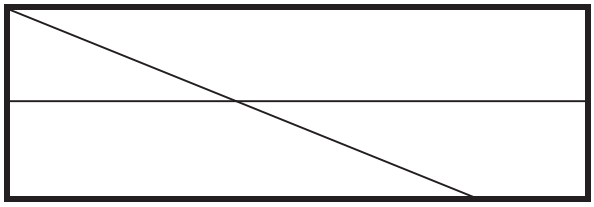
$$\frac{\square}{\square} = \frac{\square}{\square}$$

1 mark

15 Ellie draws a rectangle.



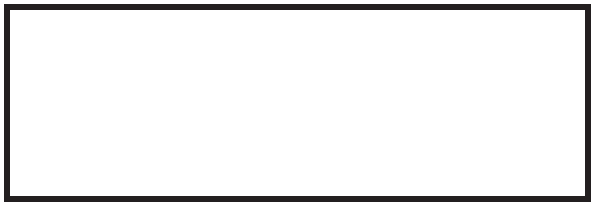
She draws two straight lines inside it.



Her lines divide the rectangle into 1 triangle and 3 quadrilaterals.

(a) Draw two straight lines inside this rectangle.

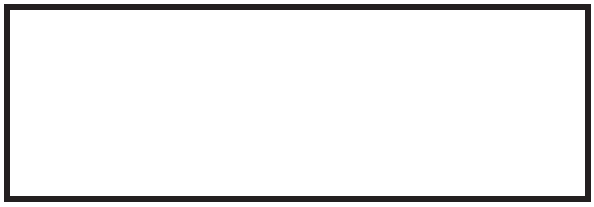
Your lines must divide the rectangle into 2 triangles and 1 quadrilateral.



. . . .
1 mark

(b) Draw two straight lines inside this rectangle.

Your lines must divide the rectangle into 3 triangles.



. . . .
1 mark

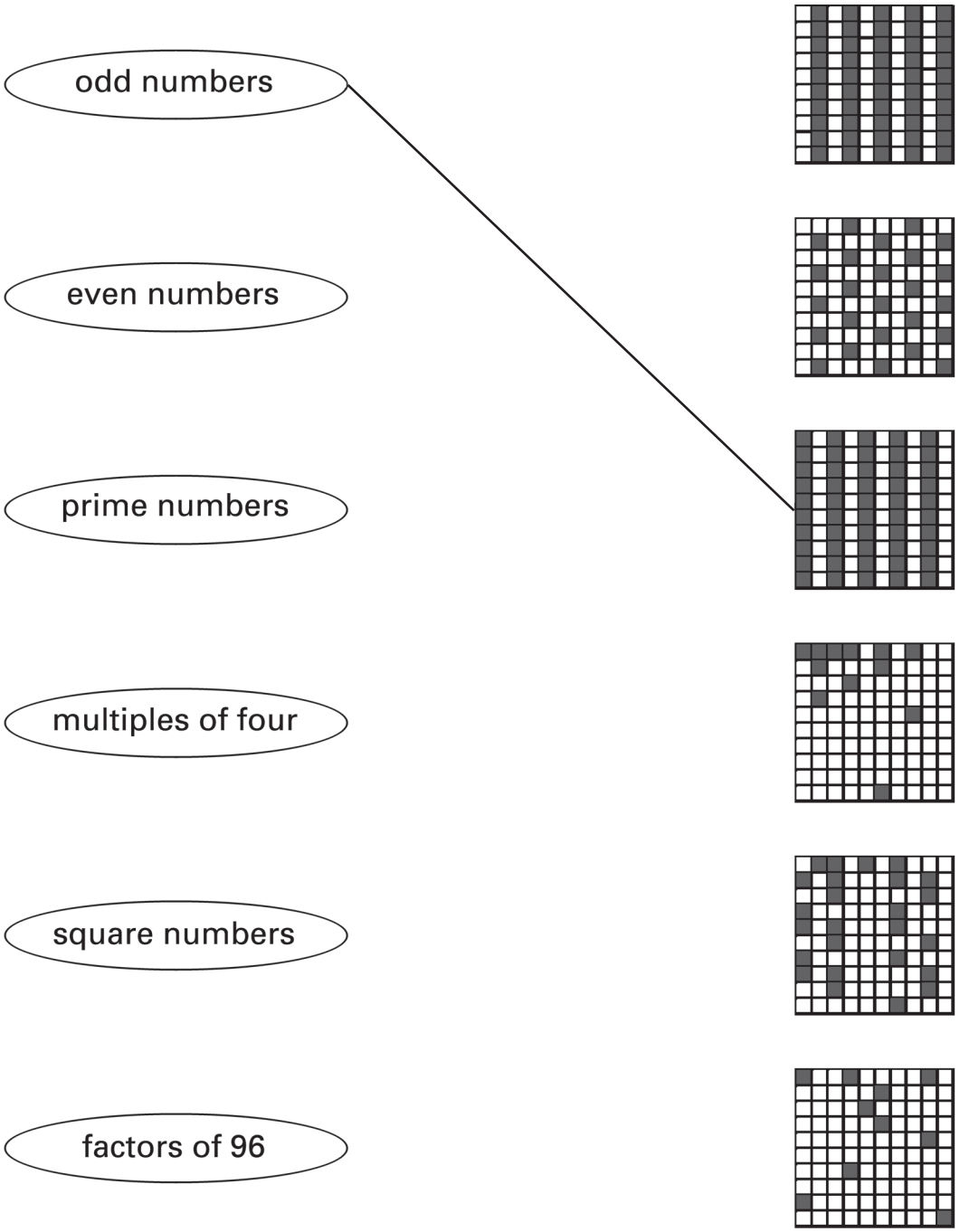
16 Lina has some hundred squares that start like this.

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

Lina shades in some numbers on her hundred squares.

Draw a line to match each description with the correct shading.

The first is done for you.



. . . .

. . . .

2 marks

17 (a) Look at this equation.

$$ab = 24$$

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

a = ... b = ...

a = ... b = ...

a = ... b = ...

a = ... b = ...

. . . .

. . . .

2 marks

(b) Now look at this equation.

$$a + b = 10$$

What values of a and b are solutions to **both** $ab = 24$ and $a + b = 10$?

a = ... b = ...

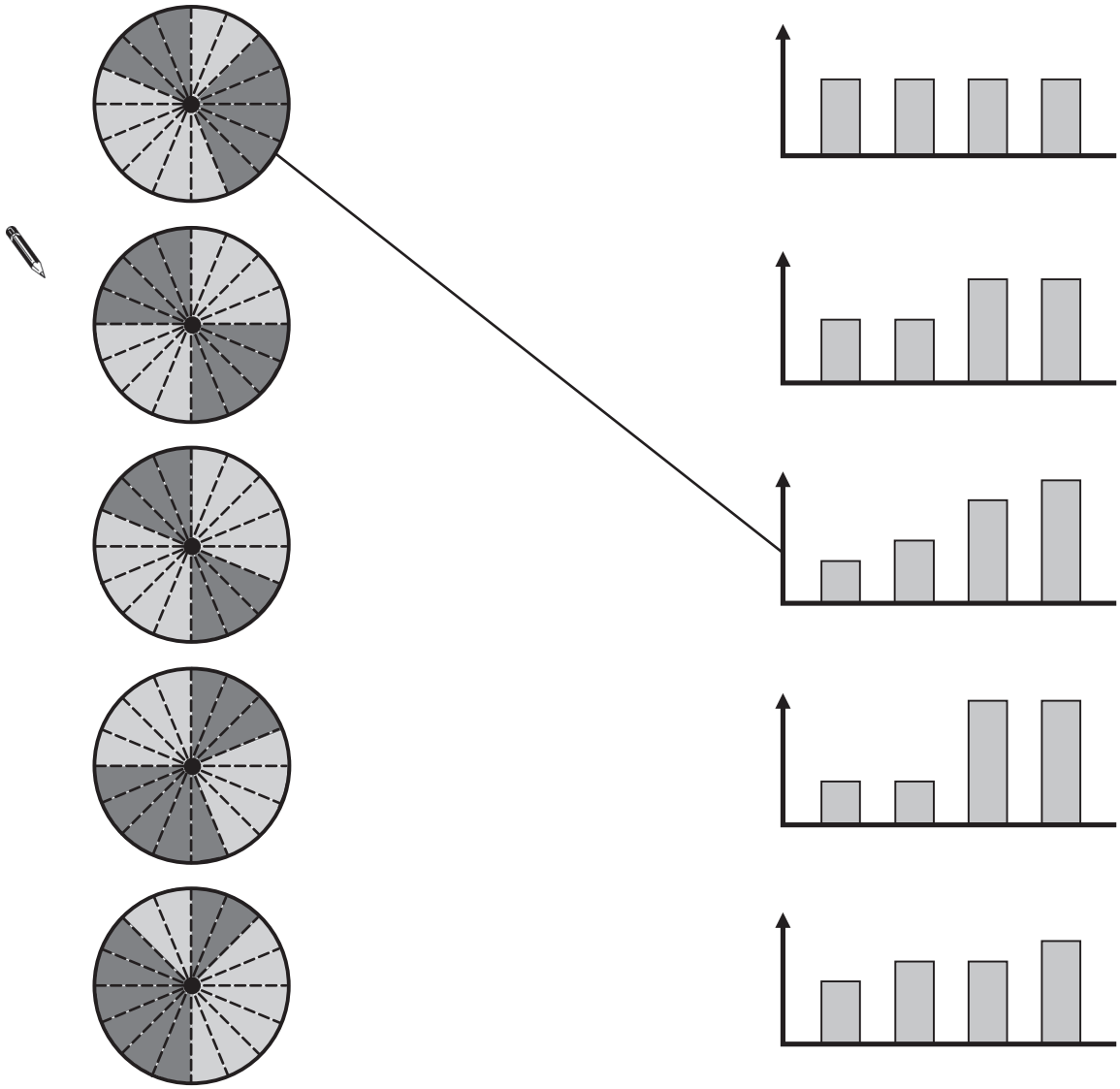
. . . .

1 mark

18 Each of these pie charts shows the same information as one of the bar charts.

Draw lines to match each pie chart with the bar chart that shows the same information.

The first is done for you.



. . . .

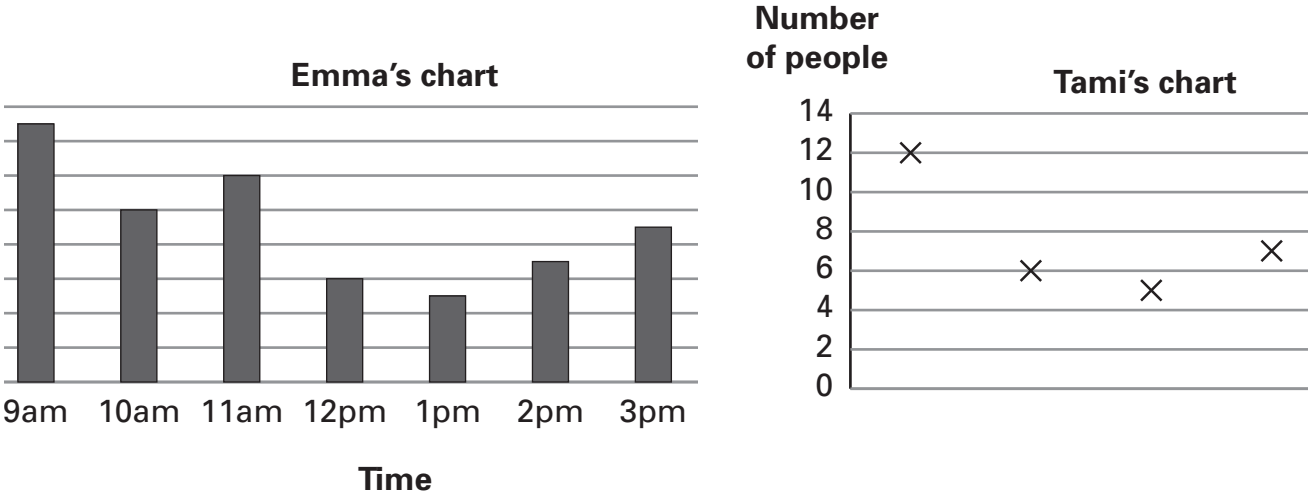
. . . .

2 marks

19 Emma and Tami collected the same data about the number of people in a shop.

Emma's chart shows all the data.

Tami's chart shows only some of the data.



Some labels are missing.

Look at **both charts** to answer each question.

(a) Emma's chart starts at 9am.

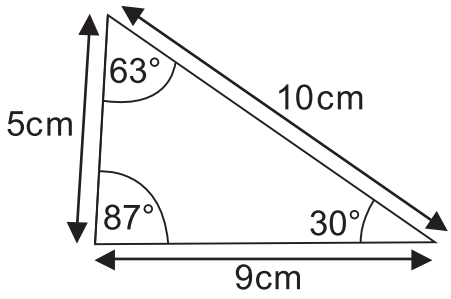
At what time does Tami's chart start?

....
1 mark

(b) How many people were in the shop at 1pm?

....
1 mark

20 Eva drew this triangle.



not drawn to scale

Colin wants to draw a scaled version of Eva's triangle.

Write what lengths and angles Colin could draw.

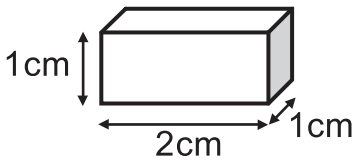
Lengths: ..... cm; ..... cm; ..... cm

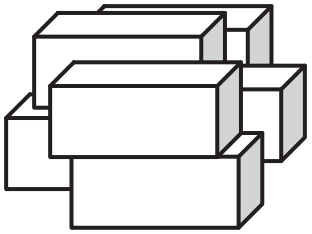
1 mark

Angles: ..... °; ..... °; ..... °

1 mark

21 Mei has lots of blocks like these.





not drawn to scale

Mei uses the smallest number of blocks she can to make a **cube**.

(a) How many blocks does Mei use?

.....

1 mark

(b) What is the volume of the cube?

..... cm^3

1 mark

22 (a) Daniel has a bag of marbles.

He has twice as many black marbles as red marbles. The rest are yellow.

He is going to take a marble at random from the bag.

The table shows the probability of taking a yellow, black or red marble.

Complete the table.

Colour	yellow	black	red
Probability	$\frac{1}{7}$		

. . . . .

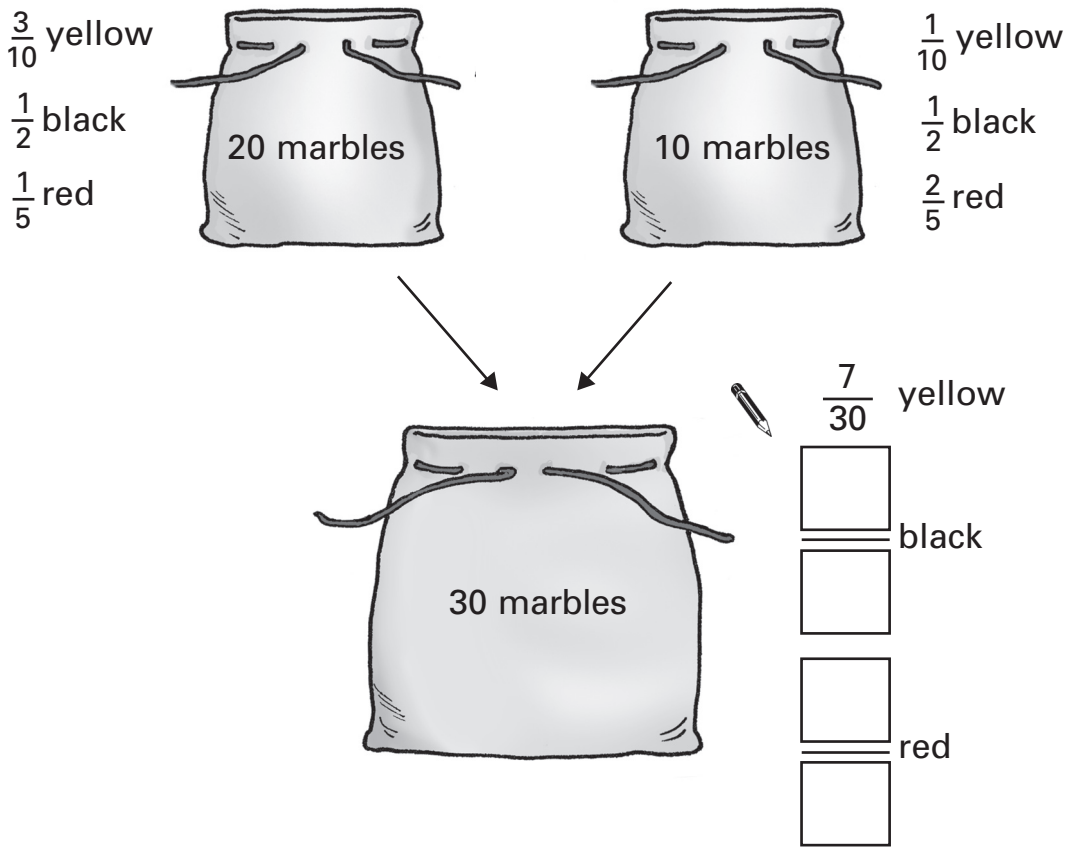
1 mark

(b) Esha has two bags of marbles.

One bag has 20 marbles and one bag has 10 marbles.

Esha puts all 30 marbles into a new bag.

Write the probability of taking a black or red marble from the new bag.



. . . . .

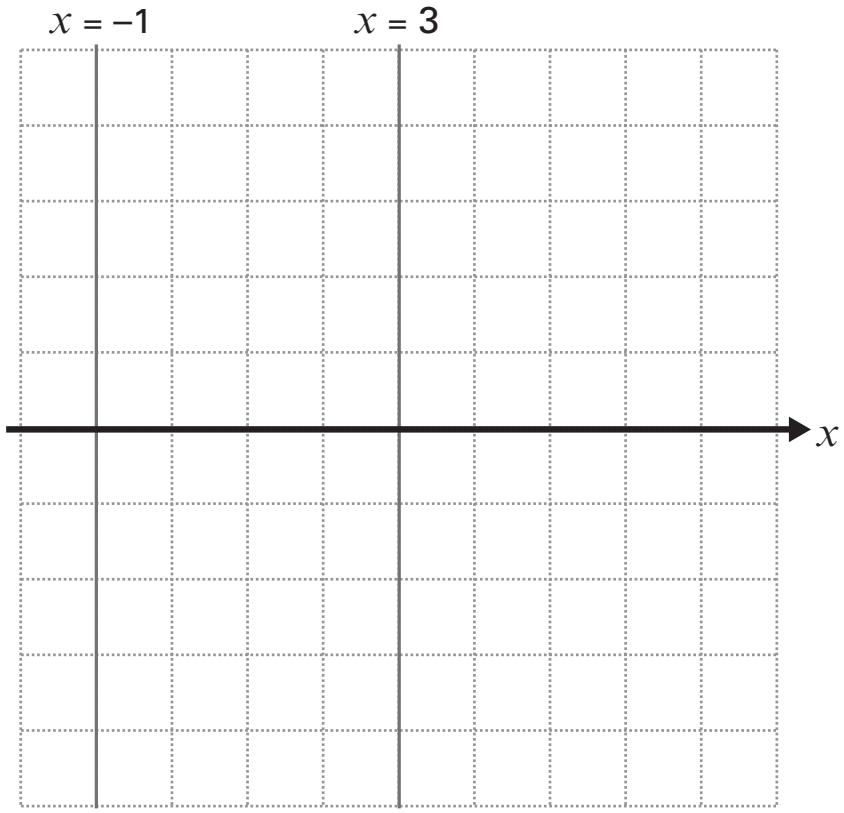
. . . . .

2 marks

23 Look at the graphs of $x = -1$ and $x = 3$

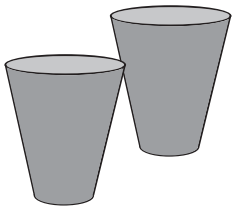
The x-axis is on the grid, but the y-axis is missing.

Draw the y-axis on the grid.



. . . . .
1 mark

24 Toby and Ada each have a pot containing the same number of counters.



Ada puts half of her counters into Toby's pot.

Toby wants to make the number of counters in each pot equal again.

What fraction of the counters in his pot must Toby put into Ada's pot?

. . . .
. . . . .
1 mark

25 Each number in this sequence is half of the number before.

Write the missing numbers.

. . . . .
. . . . . , ... , ... , 12, 6, 3, ... , ... , ...
2 marks

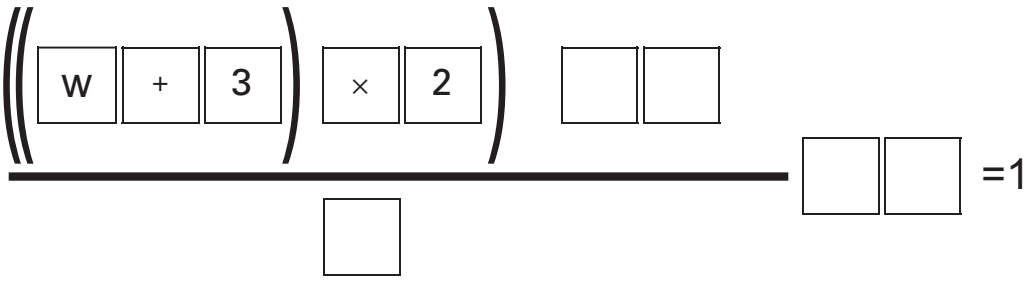
---

26 Holly says:

'Think of a number.	w
Add 3 to it.	w + 3
Double the result.	(w + 3) × 2
Take away 4	
Divide the result by 2	
Take away your original number.	
The answer is 1'	

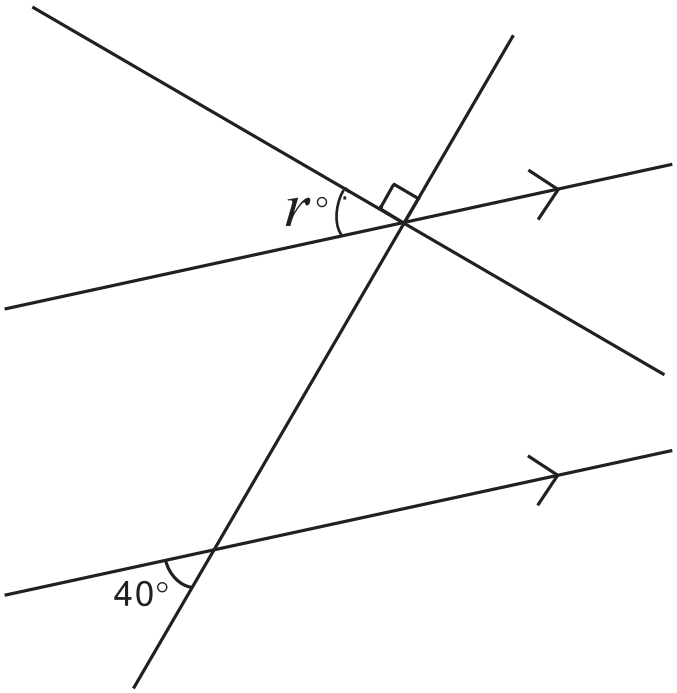
Holly starts to write her rule as an equation.

Put numbers and symbols in the empty boxes to complete the equation.



. . . . .
1 mark

27 In this diagram the two parallel lines are marked with arrows.



not drawn to scale

Work out the value of r

r = ...

1 mark

28 Which number is the mean of the other four numbers?

Put a ring around it.

12 8 11 7 2 . . . .

1 mark

29 (a) Write $\frac{6}{8}$ as a percentage.

..... %

1 mark

(b) Write $\frac{3}{8}$ as a decimal.

.....

1 mark

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