

2023 national curriculum tests

Key stage 2

Mathematics

Paper 3: reasoning

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
School name						
DfE number						



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Instructions

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

Questions and answers

You have **40 minutes** to complete this test.

Follow the instructions for each question.

Work as quickly and as carefully as you can.

If you need to do working out, you can use the space around the question.

Do not write over any barcodes.

Some questions have a method box like this:

Show your method

For these questions, you may get a mark for showing your method.

If you cannot do a question, **go on to the next one**.

You can come back to it later, if you have time.

If you finish before the end, **go back and check your work**.

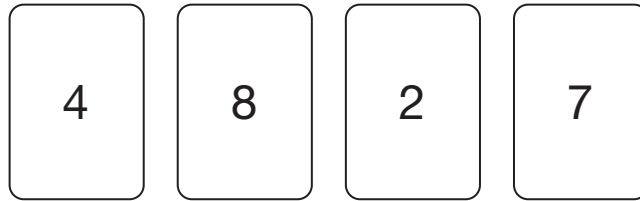
Marks

The number under each line at the side of the page tells you the number of marks available for each question.



1

Chen has these digit cards.



She uses three of the cards to make a **three-digit** number.

Each card can be used only **once**.

Chen puts the **4** in the **tens** place.

Write the **lowest** three-digit number that Chen could make.

Three empty rounded rectangular boxes are arranged horizontally, intended for the student to write the digits of the lowest three-digit number possible using the cards.

1 mark

2

Tick the number **eighty thousand, three hundred and six**.

Tick **one**.

8,306

80,036

80,306

800,306

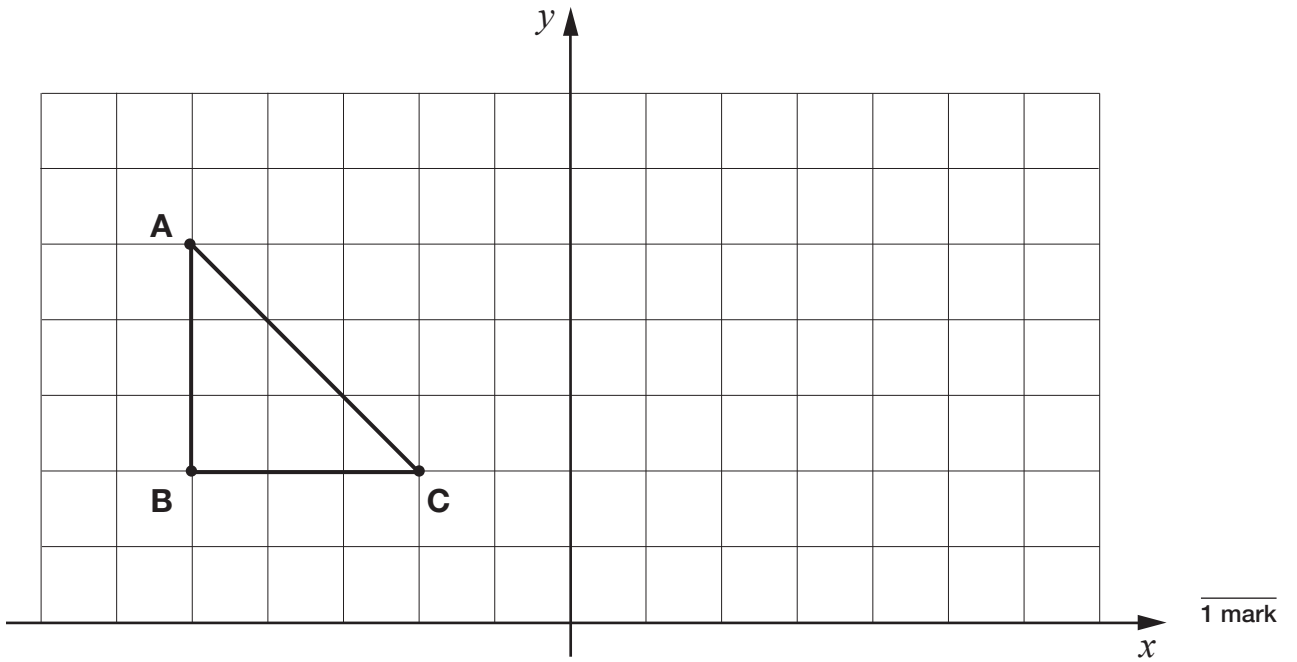
80,300,006

1 mark



3

Amina draws triangle **ABC** on a grid as shown.



She then reflects the triangle in the y -axis.

Draw the reflected triangle on the grid.

Use a ruler.



4

Write the next **two** numbers in this sequence.

1,780 1,880 1,980

1 mark

5

Circle the two decimals that round to the **same** whole number.

13.2 14.7 15.9 16.3 17.6

1 mark



6

Write the missing number to make the calculation correct.

$$1,300,450 = 1,000,000 + \boxed{} + 400 + 50$$

1 mark

7

Here is part of a number square.

The other part of the square has been torn off.

$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{1}{2}$
3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$
		9	$9\frac{1}{2}$	10
			12	$12\frac{1}{2}$

What number was in the bottom-left corner of the number square?

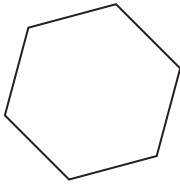
1 mark



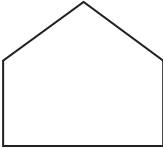
L 0 0 0 8 0 A 0 7 2 4

8

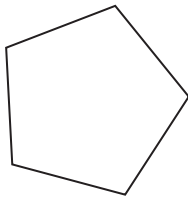
Match each shape to the correct name.



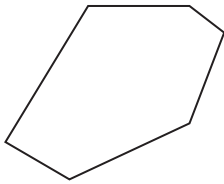
irregular pentagon



irregular hexagon



regular hexagon



regular pentagon

1 mark



9

Jack says,

I multiplied a
whole number by 3
My answer was 32



Explain why Jack is **not** correct.

A large, empty, cloud-shaped box with a scalloped border, intended for the student to write their explanation. It is centered on the page below the question.

1 mark



10

Write the missing square number to make this addition correct.

$$8^2 + \underline{\hspace{2cm}}^2 = 73$$

1 mark

11

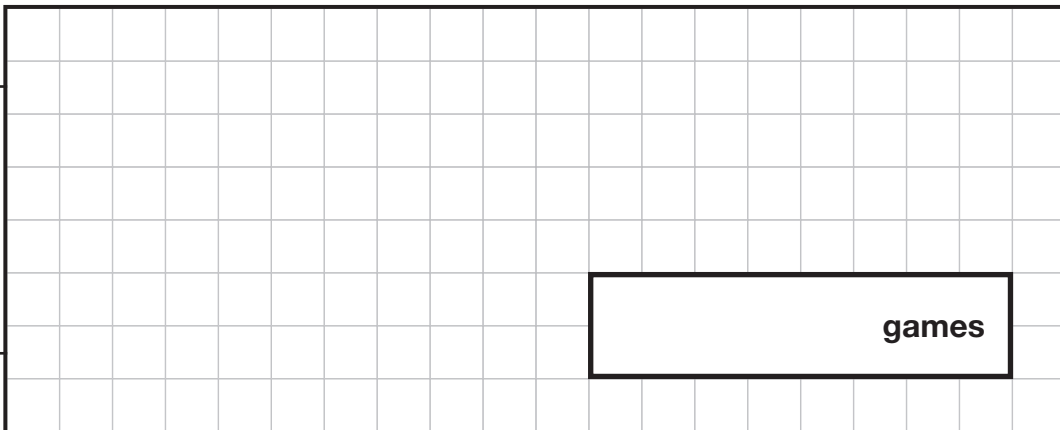
At the start of April, a shop had **15,000** games.

The shop sold:

- **7,918** games in April
- **4,624** games in May.

How many games did the shop have left at the end of May?

Show
your
method



2 marks

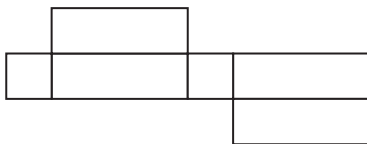
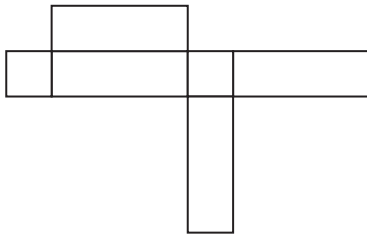
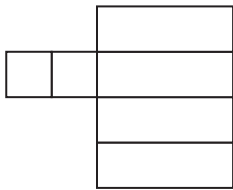


12

This is a drawing of a cuboid.



Tick the nets that could make the cuboid.



2 marks



13

Write the missing number to make this calculation correct.

$$754 \times 6 + 754 \times 3 = 754 \times$$

1 mark

14

Here are five digit cards.

Use two cards to make a fraction **equivalent to 25%**

1 mark

Use two cards to make a fraction **equivalent to 0.4**

1 mark



15

Amina went to a concert one evening.



It took her an hour and twenty minutes to get there from home.

She arrived at ten past seven.

At what time did she leave home?

1 mark

The concert started at 7:20 pm.

It finished at 9:05 pm.

How long did the concert last?

hours	minutes
-------	---------

1 mark



16

A box of 24 chocolate eggs has a mass of **870 grams**.

The empty box has a mass of **30 grams**.



What is the mass of **one** chocolate egg?

Show
your
method

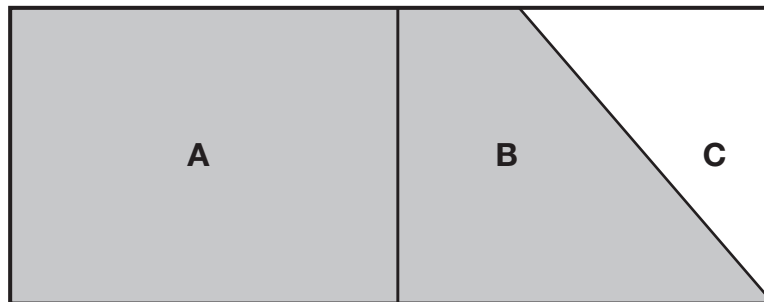
A large rectangular area filled with a 20x10 grid. On the left side, a rounded rectangular box contains the text "Show your method". On the right side of the grid, there is a smaller rectangular box containing the letter "g".

2 marks



17

This rectangle is divided into three parts.



Not
to
scale

Part **A** is $\frac{1}{2}$ of the area of the rectangle.

Part **B** is $\frac{1}{3}$ of the area of the rectangle.

What **fraction** of the area of the rectangle is **shaded**?



1 mark



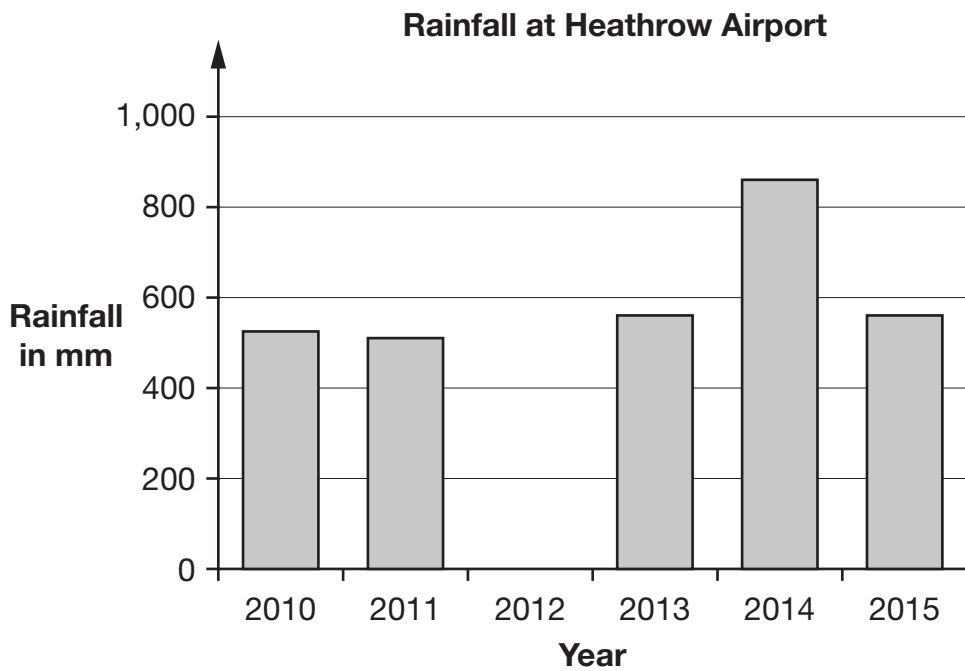
18

This table shows the total rainfall and sunshine each year at Heathrow Airport from 2010 to 2015.

Year	Rainfall in mm	Sunshine in hours
2010	521	1,371
2011	509	1,540
2012	700	1,503
2013	560	1,452
2014	864	1,669
2015	562	1,508

Use this table to complete the graph.

Use a ruler.



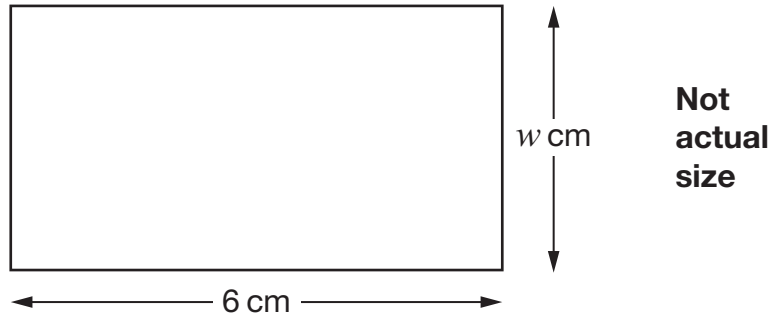
1 mark



20

The length of this rectangle is 6 cm.

The width is w cm.



Circle **all** the methods below that can be used to work out the **perimeter** of the rectangle.

$$w \times 6$$

$$w \times 2 + 12$$

$$2 \times (w + 6)$$

$$6 + w + 6 + w$$

2 marks



21

There are 25 classes in a school.

Each class has 34 pupils.

62% of all the pupils play a sport after school.

What number of pupils do not play a sport?

Show
your
method

pupils

3 marks



22

Megan uses these number machines to calculate how many diagonals different shapes have.

	number of vertices			number of diagonals
triangle	3	$\times 0$	$\div 2$	0
quadrilateral	4	$\times 1$	$\div 2$	2
pentagon	5	$\times 2$	$\div 2$	5

Complete the number machine for the **octagon**.



1 mark



23Write the missing **decimals**.

One has been done for you.

a	b	$\frac{a}{b}$
1	4	0.25
3	20	
5	8	

2 marks

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Standards
& Testing
Agency

2023 key stage 2 mathematics

Paper 3: reasoning

Print version product code: STA/23/8719/p ISBN: 978-1-78957-632-0

Electronic PDF version product code: STA/23/8719/e ISBN: 978-1-78957-653-5

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