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.

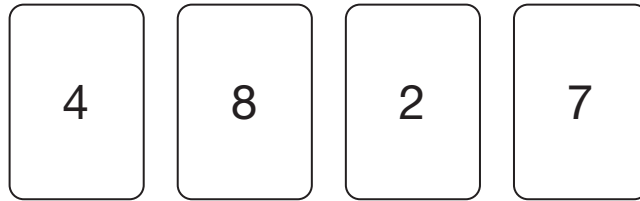If you finish before the end, **go back and check your work**.

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.

| 4 | 8 | 2 | 7 |

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.

1 mark

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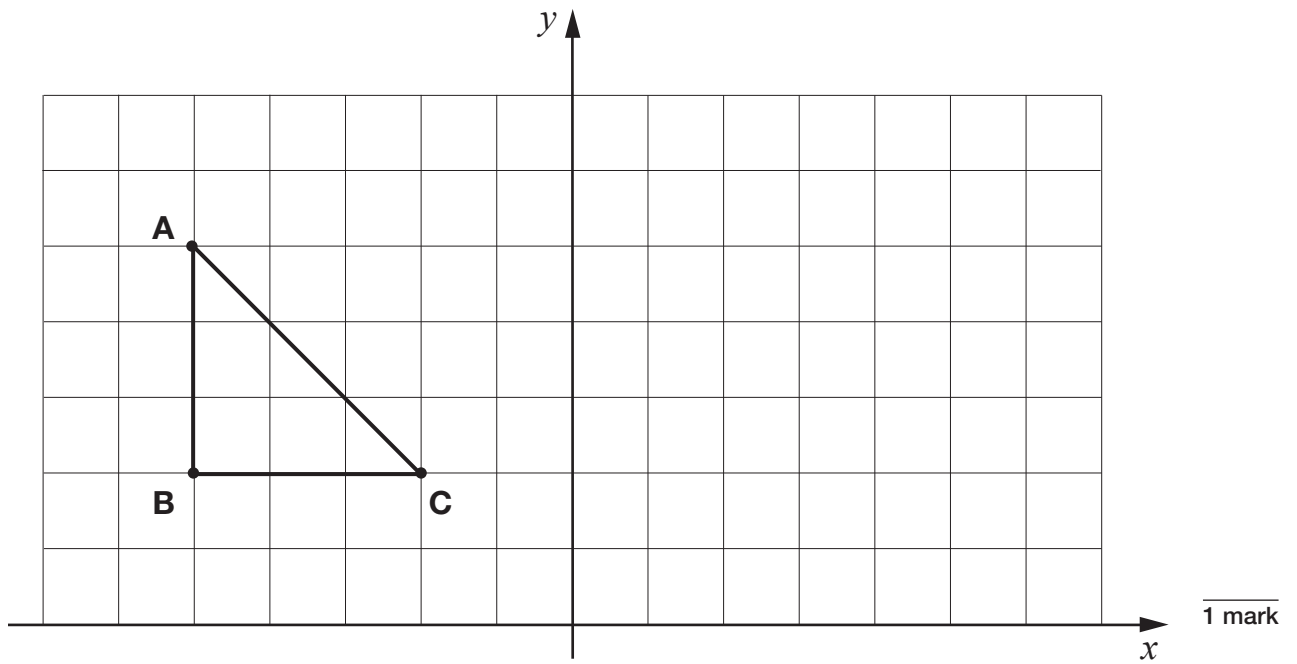
Tick **one**.

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.

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

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	$12\frac{1}{2}$

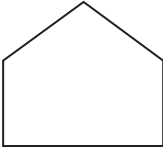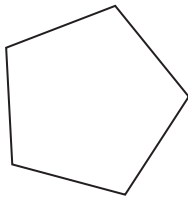What number was in the bottom-left corner of the number square?
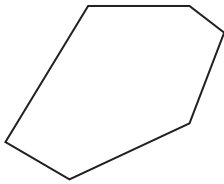
8 Match each shape to the correct name.
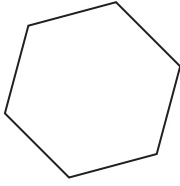
irregular pentagon

irregular hexagon

regular hexagon

regular pentagon

9 Jack says,

I multiplied a
whole number by 3
My answer was 32

Explain why Jack is **not** correct.

1 mark

10 Write the missing square number to make this addition correct.

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

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
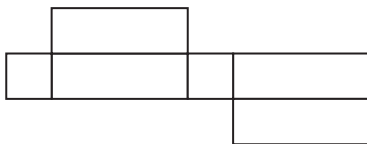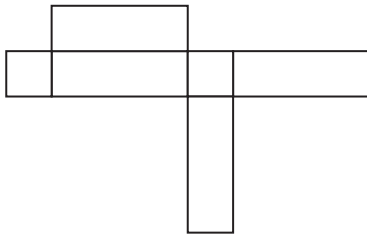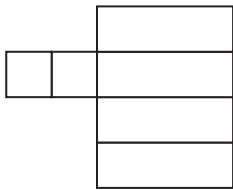
games

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.

$$754 \times 6 \ + \ 754 \times 3 \ = \ 754 \times \boxed{}$$

1 mark

14 Here are five digit cards.

| 1 | 2 | 3 | 4 | 5 |

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

$$\frac{\boxed{}}{\boxed{}}$$

1 mark

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

$$\frac{\boxed{}}{\boxed{}}$$

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?

<div align="right">1 mark</div>

The concert started at 7:20 pm.

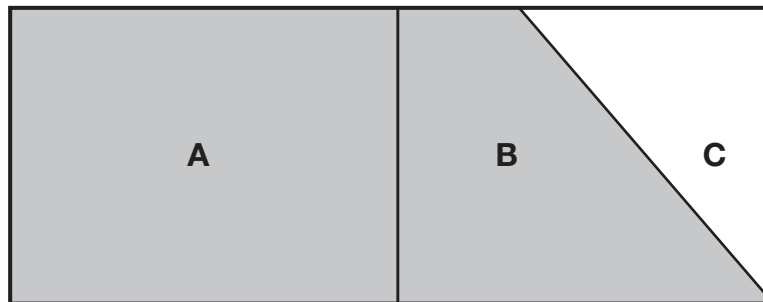It finished at 9:05 pm.

How long did the concert last?

hours	**minutes**

<div align="right">1 mark</div>

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

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

Chocolate Eggs

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

Show your method

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.

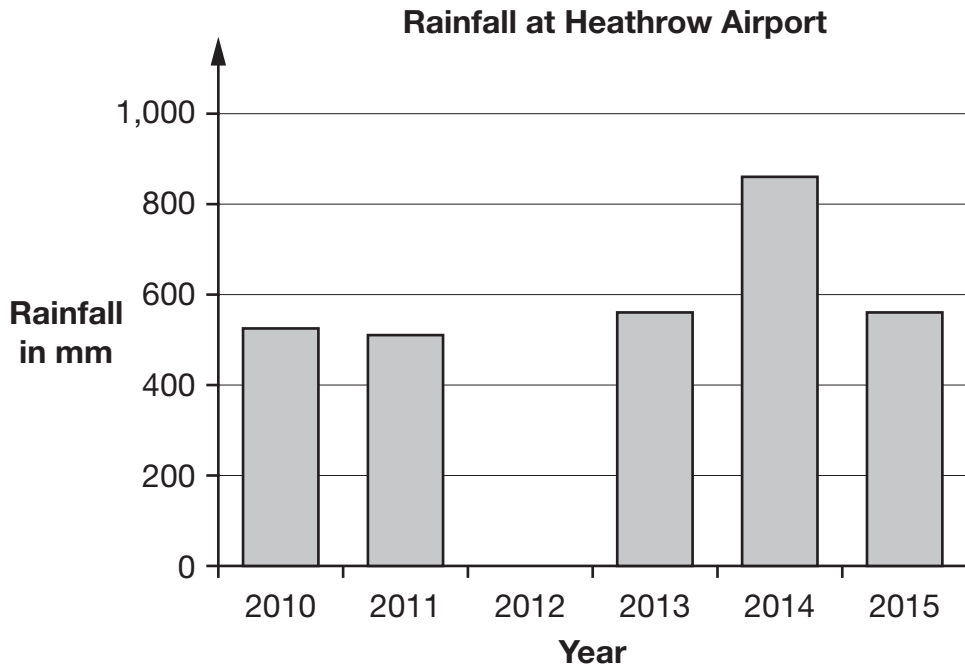What **fraction** of the area of the rectangle is **shaded**?

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.

Rainfall at Heathrow Airport

1 mark

Use the table to calculate the **mean** hours of sunshine for Heathrow Airport from **2013** to **2015**.

Show your method

hours

2 marks

19 These are the prices of some vegetables in a shop.

Mushrooms	**Carrots**
£3.20 for 1 kg	**60p for 1 kg**

Layla buys **500 grams** of mushrooms and $1\frac{1}{4}$ **kg** of carrots.

She pays with a **£5** note.

How much change does Layla get?

Show your method

£

2 marks

20 The length of this rectangle is 6 cm.

The width is w cm.

Not actual size

w cm

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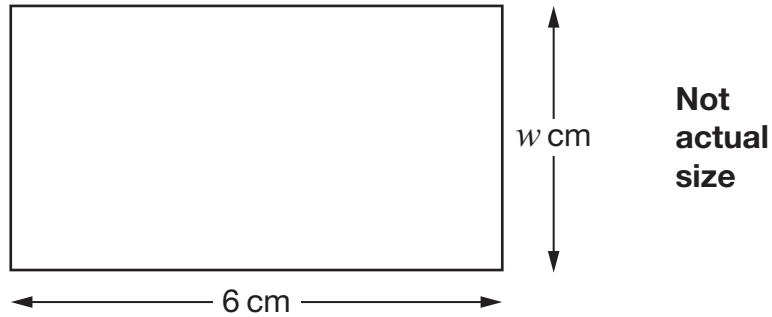
Circle **all** the methods below that can be used to work out the **perimeter** of the rectangle.

$w \times 6$

$w \times 2 + 12$

$2 \times (w + 6)$

$6 + w + 6 + w$

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	× 0	÷ 2	0
quadrilateral	4	× 1	÷ 2	2
pentagon	5	× 2	÷ 2	5

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

octagon

1 mark

23 Write the missing **decimals**.

One has been done for you.

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

2 marks

[END OF TEST]

Please do not write on this page.

Standards & Testing Agency

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