

2023 national curriculum tests

Key stage 2

Mathematics

Paper 2: reasoning

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



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Please do not write on this page.



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.

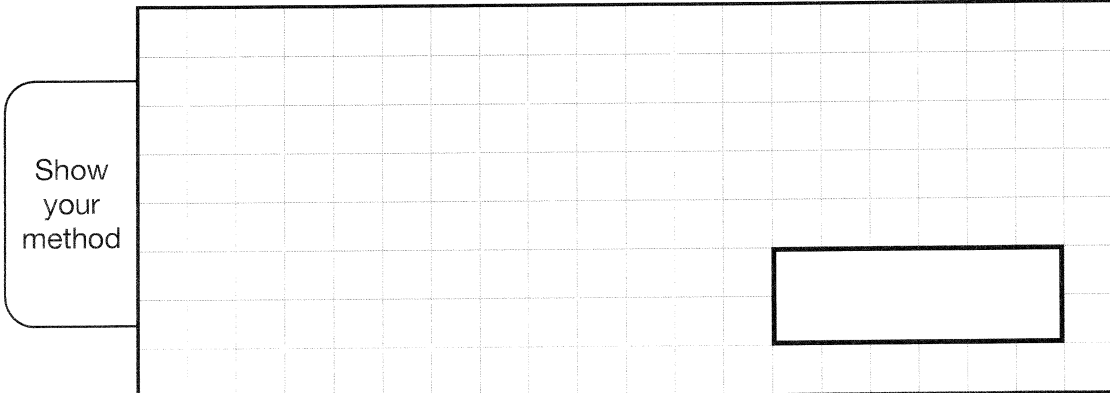
Work as quickly and as carefully as you can.

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.**

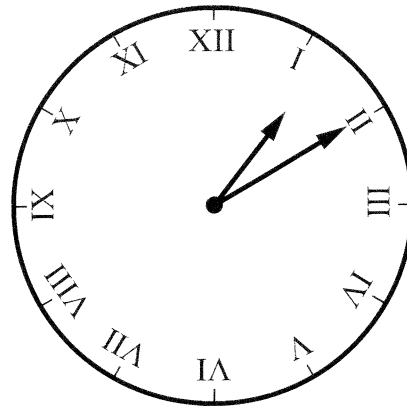
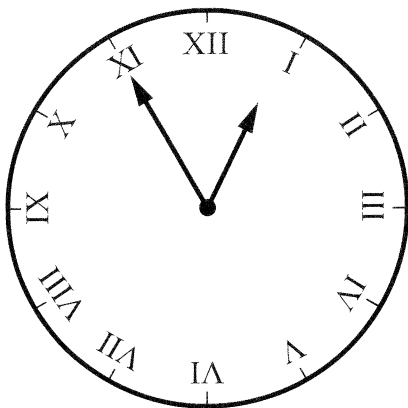
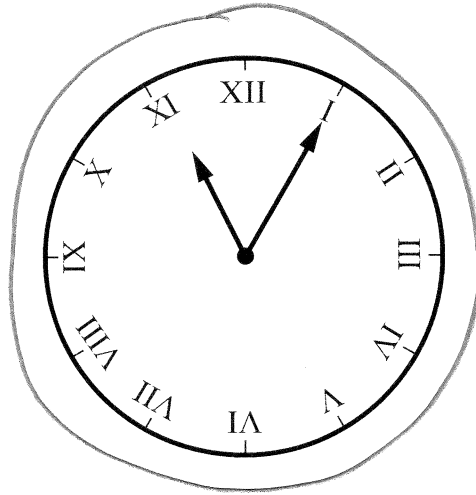
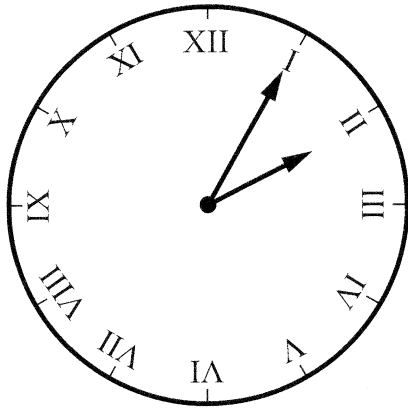
Marks

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



1

Circle the clock that shows 5 minutes past 11



1 mark



2

Write these temperatures in order, starting with the **lowest**.

~~6°C~~

~~-4°C~~

~~1°C~~

~~-10°C~~

~~3°C~~

-10 °C

-4 °C

1 °C

3 °C

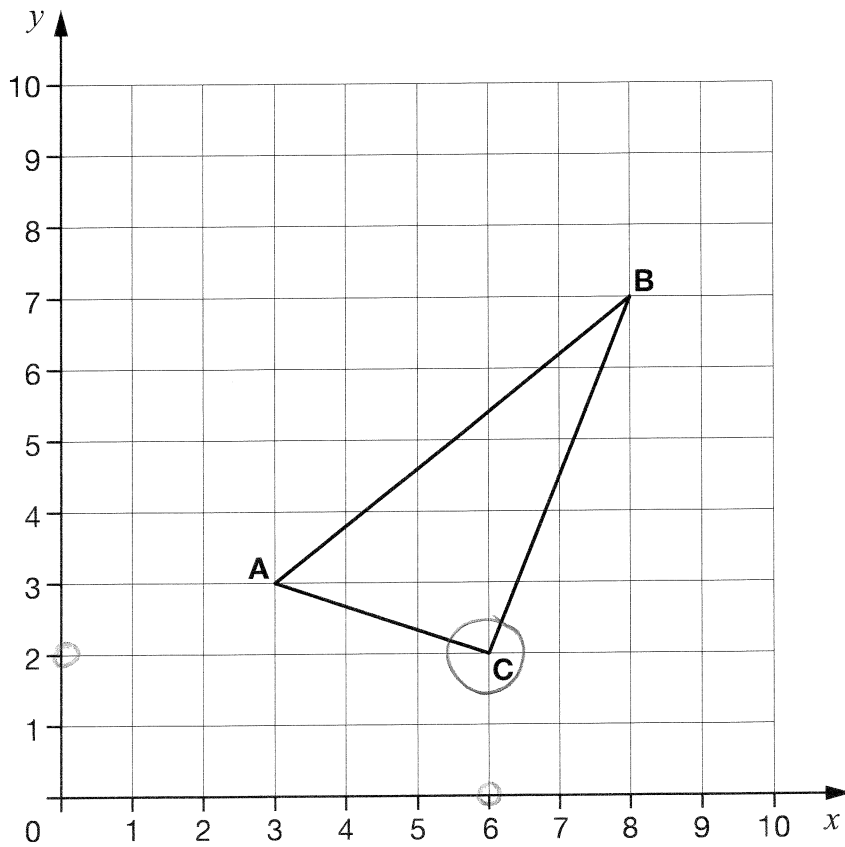
6 °C

lowest

1 mark



3



ABC is a triangle.

What are the coordinates of point **C**?

Read the x axis first then
the y axis.

(6, 2)


1 mark


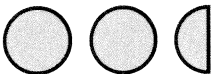
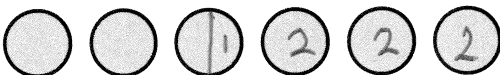



4

Some children choose their favourite zoo animal.

The pictogram shows the results.

Key:  stands for 2 children

Animal	Number of children
penguin	
elephant	
tiger	
giraffe	

How many **more** children choose tiger than elephant?

Remember to check the
Key.

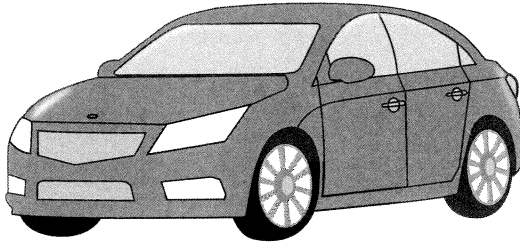
7

1 mark

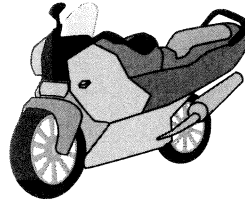


5

Cars and motorbikes are parked in a street.



car
4 wheels



motorbike
2 wheels

Stefan counts 3 motorbikes and 5 cars.

He counts **28 wheels** altogether.

Explain why Stefan **cannot** be correct.

$3 \times 2 = 6$ so the motor-
bikes have 6 wheels

$5 \times 4 = 20$ so the cars have
20 wheels.

The total is 26 not 28.

1 mark



6

Kirsty buys 1 litre of apple juice for £1.39

She pays with a £5 note.

How much change does Kirsty get?

$$\begin{array}{r} 49 \\ \cancel{5}.00 \\ - 1.39 \\ \hline 3.61 \end{array}$$

£ 3.61

1 mark

7

Here is a number sequence.

$$75 \quad \overset{-25}{50} \quad \overset{-25}{25} \quad \overset{-25}{\boxed{0}} \quad \overset{-25}{\boxed{-25}}$$

1 mark

Write the next two numbers in the sequence.



L 0 0 0 7 0 A 0 9 2 4

8

In 2012, there were **24,372** schools in the United Kingdom.

Round the number of schools to the **nearest hundred**.

HTO
24 3 7 2
 *

24 400

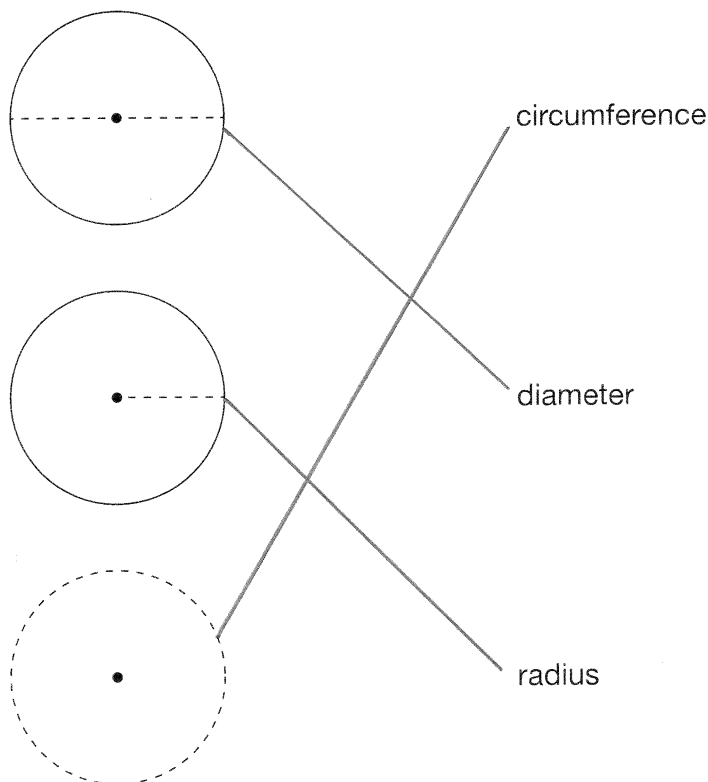
1 mark

The tens number is over 5 so we round up.

9

Here are some diagrams showing parts of a circle.

Match each diagram to the name of the dashed line.



1 mark



10

Ken thinks of a number.

He divides it by 3

The answer is 72

What number was Ken thinking of?

Do the inverse to find
the answer.

$$\begin{array}{r} 72 \\ \times 3 \\ \hline 216 \end{array}$$

216

1 mark

11

Write the number that is **one thousand more** than 19,039

20,039

1 mark

Write the number that is **one hundred less** than 19,039

18,939

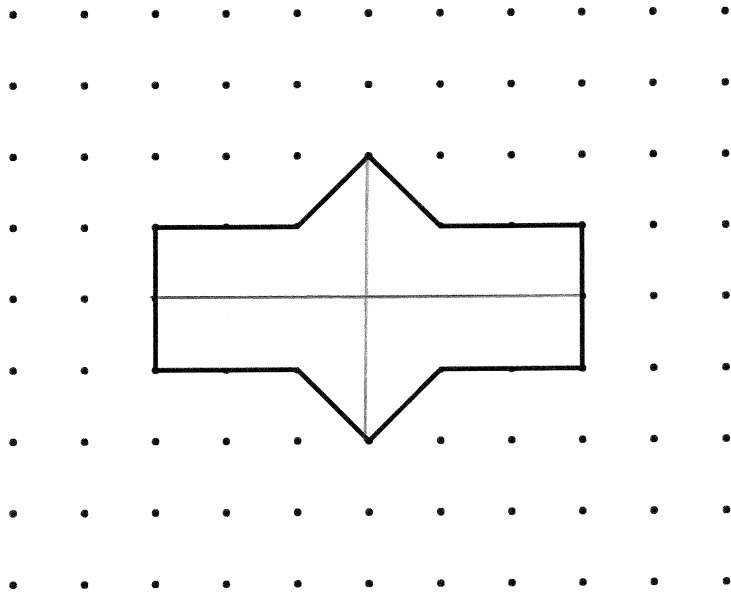
1 mark



12

Draw all the lines of symmetry on this shape.

Use a ruler.



1 mark



13

$\frac{1}{5}$ of a number is 22

What is the number?

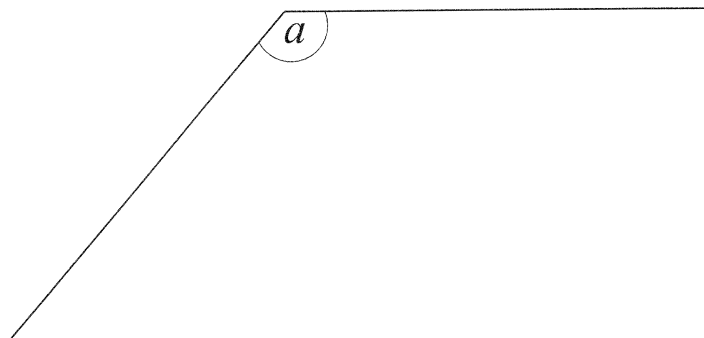
$$\frac{1}{5} = 22$$

$$22 \times 5 = 110$$

110

1 mark

14



Measure angle a .

a is

130°

1 mark



15

Here are four fractions.

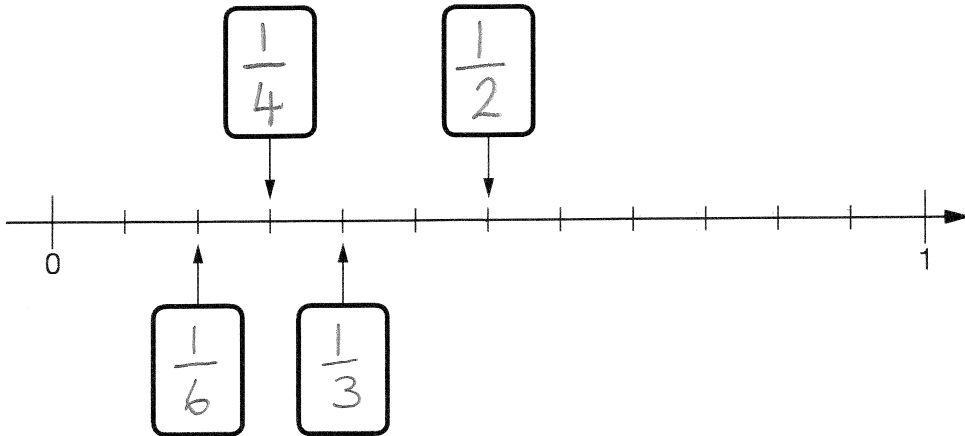
$$\frac{1}{3}$$

$$\frac{1}{6}$$

$$\frac{1}{4}$$

$$\frac{1}{2}$$

Write the fractions in the correct place on the number line.



1 mark



16

One day last year, the rate of rainfall from 6:30 am until 9:00 am was 2 millimetres per hour.

What was the **total** rainfall from 6:30 am until 9:00 am?

6.30 } 1hr
 7.30 }
 8.30 } 2hrs
 9.00 } 2½ hrs

$$2\frac{1}{2} \times 2$$

5 mm

1 mark

17

The manager of a flower shop orders 4 boxes of red roses.

There are 50 roses in each box.

The manager makes bunches with 6 roses in each bunch.

What is the **greatest** number of bunches that can be made?

Show
your
method

$$4 \times 50 = 200$$

$$\begin{array}{r} 33 \text{ r } 2 \\ 6 \overline{) 200} \end{array}$$

33

2 marks



L 0 0 0 7 0 A 0 1 5 2 4

18

A cinema sells tickets at three different prices.

- $\frac{1}{20}$ of the tickets are price A.
- $\frac{3}{5}$ of the tickets are price B.
- The rest of the tickets are price C.

Find the common denominator. e.g. 20

What fraction of the tickets are price C?

Show
your
method

$$\begin{array}{l} \frac{3 \times 4}{5 \times 4} = \frac{12}{20} \\ \frac{1}{20} + \frac{12}{20} = \frac{13}{20} \quad \frac{20}{20} - \frac{13}{20} = \frac{7}{20} \end{array}$$

$$\frac{7}{20}$$

2 marks



19

Write the missing number to make this **division** correct.

$$15,000 \div \boxed{200} = 75$$

1 mark

$$75 \times 2 = 150$$

so $75 \times 200 = 15000$

20

Write the two missing digits to make this **long multiplication** correct.

$$\begin{array}{r}
 \boxed{3}235 \\
 \times \quad \quad \boxed{5}3 \\
 \hline
 \quad \quad \quad 9705 \\
 161750 \\
 \hline
 171455
 \end{array}$$

2 marks



L 0 0 0 7 0 A 0 1 7 2 4

21

The height of the tallest person in history is 8 feet 11 inches.

Conversion table	
One foot	30 centimetres
One inch	2.5 centimetres

Use this conversion table to calculate the height of the tallest person, in **centimetres**.

Show
your
method

	$8 \times 30 = 240$				
x	$\begin{array}{r} 11 \\ 25 \\ \hline 55 \\ 220 \end{array}$	+	$\begin{array}{r} 240.0 \\ 27.5 \\ \hline 267.5 \end{array}$	267.5 cm	
+	$\begin{array}{r} 220 \\ 27.5 \\ \hline 247.5 \end{array}$				
	<i>(Remember to re-place the decimal point.)</i>				

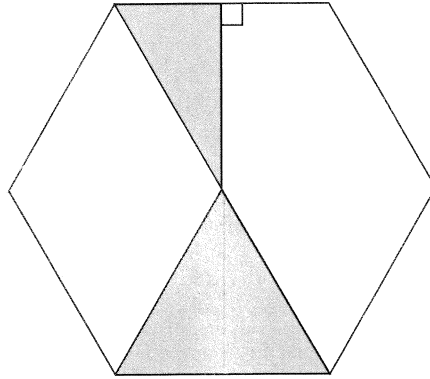
2 marks



22

Here is a regular hexagon.

The area of the large shaded triangle is double the area of the small shaded triangle.



What **fraction** of the whole hexagon is the shaded area?

$$\frac{3}{12}$$

1 mark

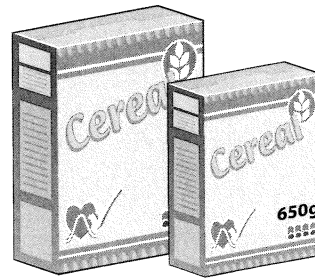


23

A small box contains **650** grams of cereal.

A large box contains **20% more** cereal.

One portion of cereal is **40** grams.



How many **full** portions are in a **large** box?

Show your method

					40	240
	10%	of 650 = 65			80	280
	20%	of 650 = 130			120	320
					160	380
					200	
	650			19		
	+ 130		40 780			
	<u>780</u>		- 40		19	portions
			· 38			

2 marks

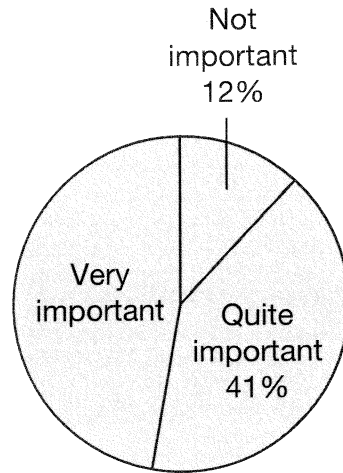


24

1,200 pupils were asked this question:

How important is it to have a break when using a screen?

This chart shows the results.



How many pupils answered 'Very important'?

$$12 + 41 = 53$$

$$47\% \text{ of } 1200$$

$$47\% \text{ of } 1000 = 470$$

$$47\% \text{ of } 200 = + 94$$

$$\underline{\underline{564}}$$

564 pupils

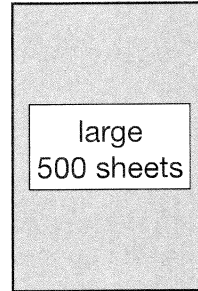
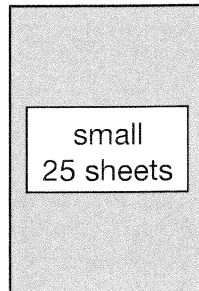
1 mark



25

There are 25 sheets of paper in a small pack.

There are 500 sheets in a large pack.



How many small packs make one large pack?

$$25 \overline{)500} \begin{array}{r} 20 \\ \underline{500} \\ 0 \end{array}$$

20

1 mark

The mass of the paper in the large pack is 2.4 kilograms.

What is the mass of **one sheet** of paper, in **grams**?

Show your method

$2.4 \times 1000 = 2400$

$$\begin{array}{r} 4.8 \\ 500 \overline{)2400.0} \\ \underline{-2000} \\ 4000 \\ \underline{-4000} \\ 0 \end{array}$$

4.8 g

2 marks



26

This formula is used to estimate the mass (in kilograms) of young children.

$$\text{mass} = 2 \times (\text{age in years} + 5)$$

Stefan's sister is 4 years of age.

Use the formula to estimate her mass.

BIDMAS

$$2 \times (4 + 5)$$

$$2 \times 9 = 18$$

18 kg

1 mark

The mass of Megan's brother is 16 kilograms.

Use the formula to estimate his age.

$$16 = 2 \times (3 + 5)$$

$$16 = 2 \times 8$$

3 years

1 mark



L 0 0 0 7 0 A 0 2 3 2 4



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Agency

2023 key stage 2 mathematics

Paper 2: reasoning

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