2024 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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Instructions

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

Questions and answers

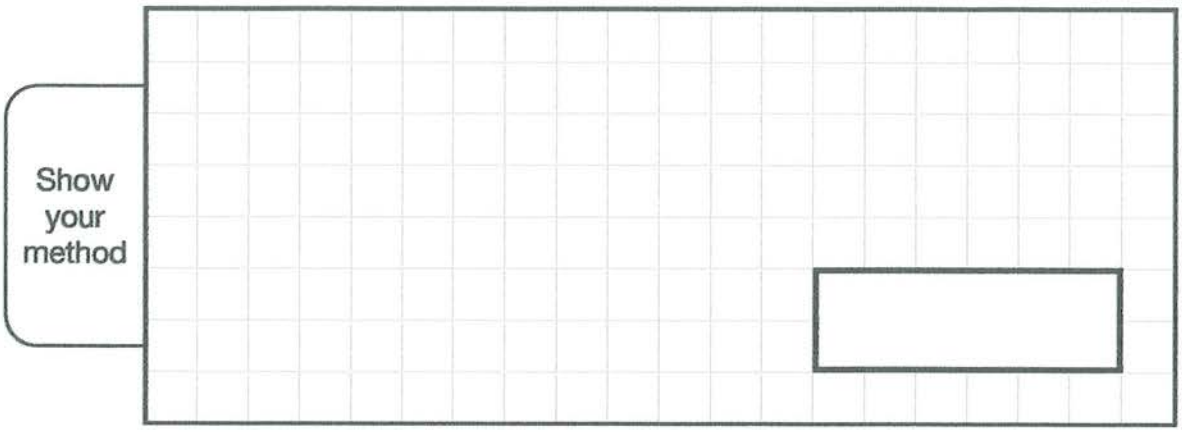
You have **40 minutes** to complete this test.

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:



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

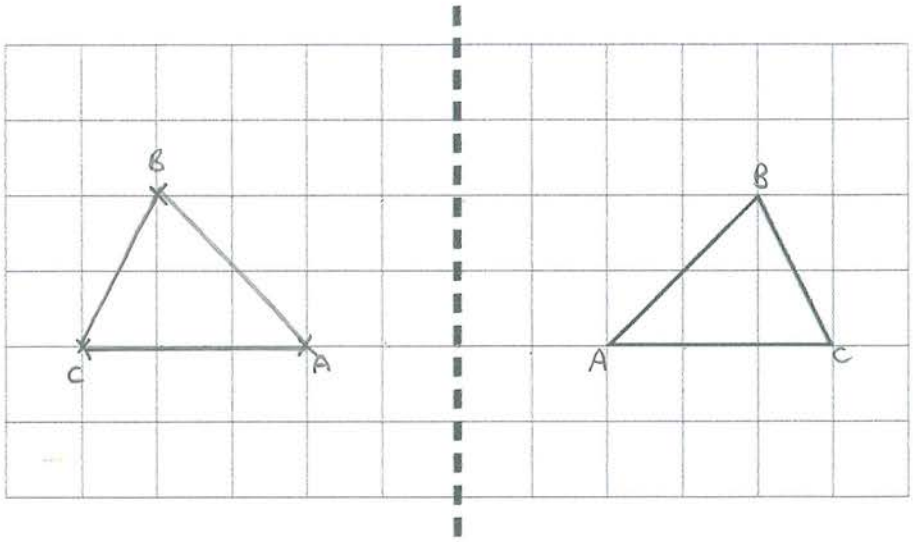
If you cannot do a question, **go on to the next one**.
You can come back to it later, if you have time.

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 Here is a triangle on a grid.



mirror line

Draw the reflection of the triangle in the mirror line.

Use a ruler.

1 mark

2 This table shows the cost of fruit at a school cafeteria.

Fruit	Cost for one
banana	12p
plum	23p
apple	32p
pear	38p

38 + 12 = 50

Amir buys two pieces of fruit.

He pays with a £2 coin.

He gets £1.50 change. He spends 50p

Tick the **two** pieces of fruit that Amir buys.

Tick **two**.

banana ☑

plum ☐

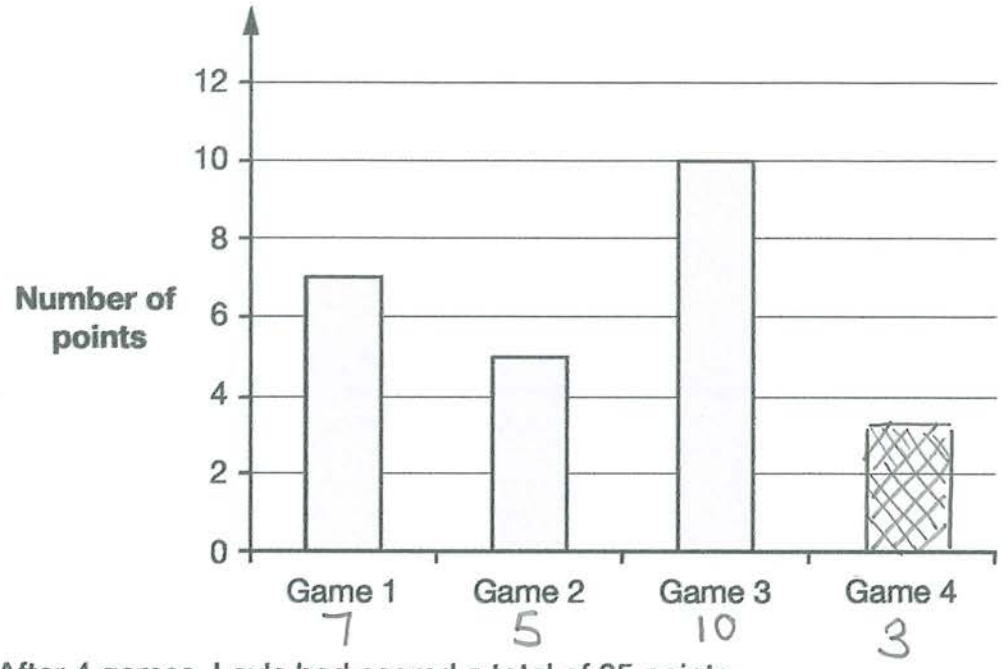
apple ☐

pear ☑

1 mark

3 Layla plays basketball.

This graph shows how many points she scored in her first 3 games.



1 mark

After 4 games, Layla had scored a total of 25 points.

Complete the graph.

Use a ruler.

4 The numbers in this sequence increase by the same amount each time.

Write the missing numbers.

−11	−5	1	7	13	19

+ 6

$-11 + 6 = -5$ $7 + 6 = 13$

1 mark

5 Write the three missing digits to make this multiplication correct.

$$\begin{array}{r} \boxed{2}\,5\,\boxed{4} \\ \times \qquad 3 \\ \hline 7\,\boxed{6}\,2 \end{array}$$

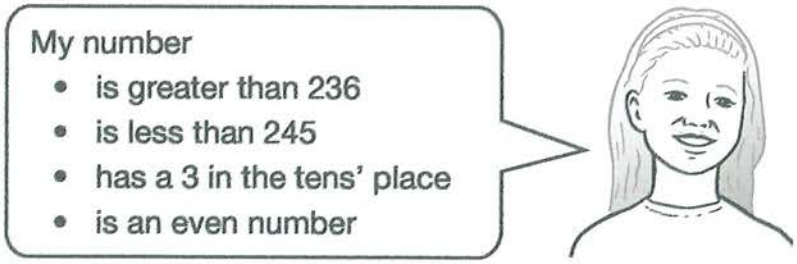
$3 \times 4 = 12$

$3 \times 5 = 15$

$2 \times 3 = 6$

1 mark

6 Olivia is thinking of a number.



What number is Olivia thinking of?

237 → 244

237 238 239

even

238

1 mark

7 A box holds 40 packets of envelopes.

Each packet holds 25 envelopes.

How many **envelopes** does the box hold?

$4 \times 25 = 100$

$100 \times 10 = 1000$

1000

1 mark

8 Write a **whole number** in each box to make the statements correct.

One has been done for you.

18 rounded to the nearest **ten** is 20

3999 rounded to the nearest **thousand** is 4,000

Any number between 3500 and 4499

819 999 rounded to the nearest **ten thousand** is 820,000

Any number between 815000 and 824999

1 mark

9

0.4 4 ÷ 10	4 40 ÷ 10
4 ÷ 100 0.04	40 ÷ 100 0.4

Two of these calculations have the same answer.

Write this answer as a **decimal.**

0.4

1 mark

10 Circle the two **prime** numbers that have a difference of 2

Prime Prime Prime

15 (17) (19) 21 23 25

1 mark

11 This table shows the number of children and adults at a childcare centre.

Complete the table to make it correct.

The first row has been done for you.

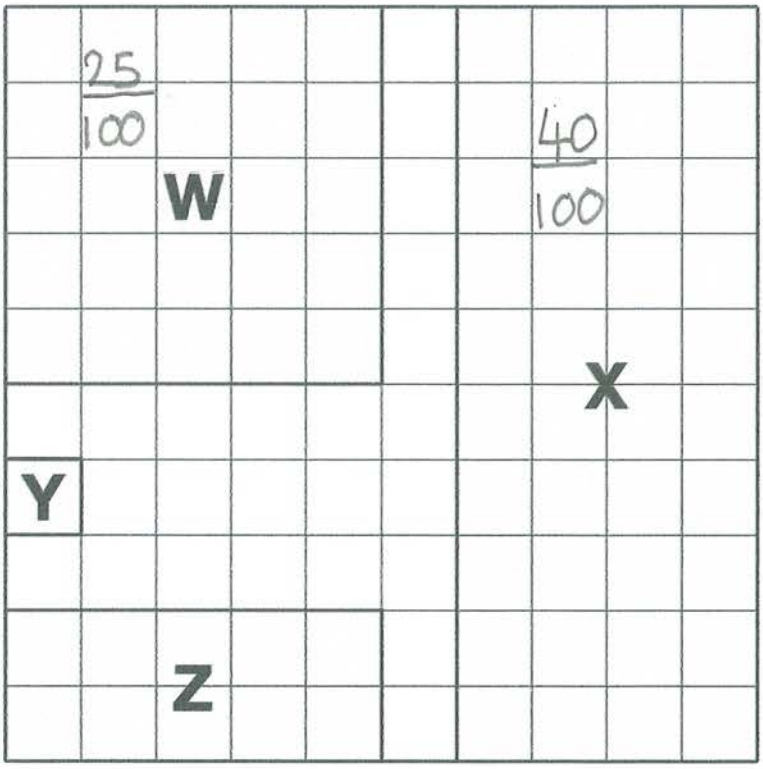
Age in years	Number of children	Number of adults	Number of children per adult
1 and under	12	4	3
2 or 3	20	5	4
4 or 5	24	3	8

$20 \div 5 = 4$

$3 \times 8 = 24$

1 mark

12 Shapes **W, X, Y** and **Z** cover different fractions of this 10 by 10 square.



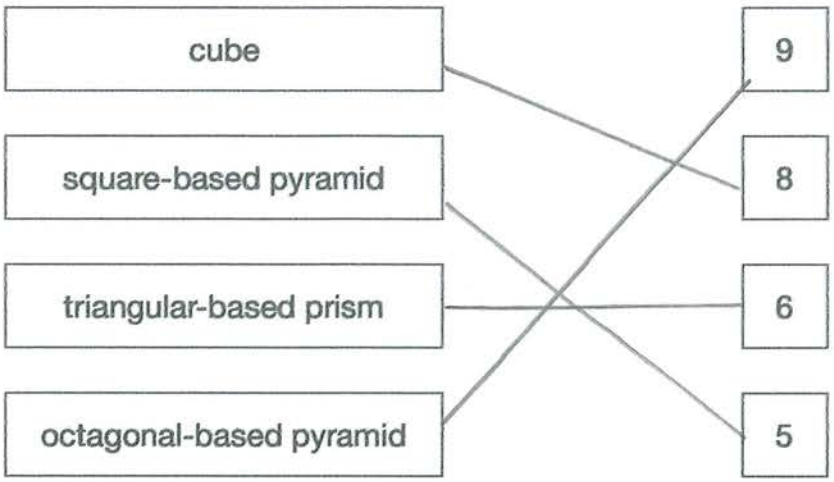
Each square is $\frac{1}{100}$
Each row $\frac{1}{10}$

Match each shape to the correct fraction.

Shape **W**	$\frac{1}{4}$
Shape **X**	$\frac{2}{5}$
Shape **Y**	$\frac{1}{100}$
Shape **Z**	$\frac{1}{10}$

1 mark

13 Match the name of each 3-D shape to its number of vertices.



1 mark

14 A class votes for a captain.

Three-quarters of the class vote for Sam.

The remaining 7 pupils vote for Alex.

How many pupils are in the class?

$\frac{1}{4} = 7$

$7 \times 4 = 28$

28

1 mark

15 Write the missing number to make this **multiplication** correct.

$3.207 \times 100 = \boxed{32.07} \times 10$

320.7

1 mark

16 Here is a number.

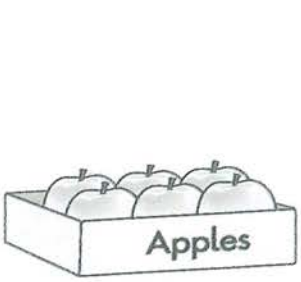
HT HTO
9,658,214

Tick the statements that are **true**.

- The digit 5 represents 50,000 ☑
- The value of the digit 9 is nine hundred thousands. ☐
- The digit 6 represents 6 millions. ☐
- The value of the digit 2 is twenty tens. ☑

2 marks

17 Chen buys these four items.



670 grams
£1.50

400 grams
£0.70

500 grams

750 grams
£1.45

Chen pays for the four items with a £10 note. The price of the butter is not shown.

She receives £3.85 change.

What is the price of the **butter**?

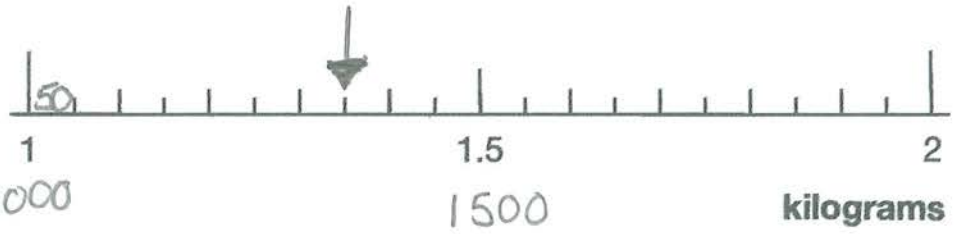
Show your method

$$\begin{array}{r} {}^{0}\cancel{1}\,{}^{9}\cancel{0}\,{}^{9}\cancel{0} \\ -\ 3.85 \\ \hline 6.15 \end{array} \qquad \begin{array}{r} 1.50 \\ +\ 0.70 \\ \hline 1.45 \\ \hline 3.65 \\ {\scriptstyle 1} \end{array} \qquad \begin{array}{r} {}^{5}\cancel{6}\,{}^{1}1\,5 \\ -\ 3.65 \\ \hline 2.50 \end{array}$$

£ 2.50

2 marks

18 Draw an arrow (↑) on the scale below to show **1350 grams**.



1 mark

* Work out the scale first

19 A hall has 1,250 seats.

At 7 pm, 880 seats are filled.

At 8 pm, there are 40 empty seats.

How many seats were filled between 7 pm and 8 pm?

Show your method

$$\begin{array}{r} {}^{0}\cancel{1}{}^{1}\cancel{2}{}^{1}50 \\ -\ 880 \\ \hline 370 \end{array} \qquad \begin{array}{r} 370 \\ -\ 40 \\ \hline 330 \end{array}$$

330 seats

2 marks

20 Each day, a school has

- break from 10:15 am to 10:30 am
- lunchtime from 12:40 pm to 1:30 pm.

What is the **total** time the school has for breaks and lunchtime in a 5-day week?

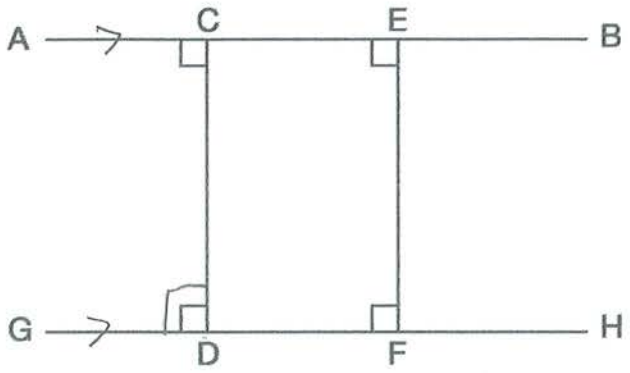
Show your method

10:15 → 10:30 = 15 mins
12:40 → 1:30 = 50 mins
each day has 1 hour and 5 minutes

5 **hours** 25 **minutes**

2 marks

21



Tick **all** the correct statements.

AB is parallel to CD ☐

GH is parallel to AB ☑

CD is perpendicular to GH ☑

EF is perpendicular to CD ☐

1 mark

22 This table shows the distance that five friends travel to school each day.

Name	Distance (km)
Amina	1.8
William	2.4
Layla	3.2
Chen	1.6
Dev	4.5

What is the **mean** distance they travel to school each day?

Show your method

$$\begin{array}{r} 1.8 \\ 2.4 \\ +\ 3.2 \\ 1.6 \\ 4.5 \\ \hline 13.5 \\ 2 \end{array} \qquad 5 \overline{)13.35} = 02.7$$

2.7 km

2 marks

23 Mrs Mills has **940** seeds to plant into trays.

She plants **12** seeds in each tray.

The last tray is not full.

What **fraction** of the last tray is filled?

Show your method

```
   78 r 4
12|940
  -840
   100
   -96
     4
```

12
24
36
48
60
72
84
96

$\frac{4}{12}$

2 marks

24 Here are four numbers.

40	60	64	100
$40 \times 2 = 80$ $40 \times 3 = 120$	$4 \times 15 = 60$ $5 \times 12 = 60$	4^3	10^2

Use each number **once** to complete these statements.

100	is a square number.
64	is a cube number.
60	is a common multiple of **4** and **5**
40	is a common factor of **80** and **120**

2 marks

25 Write the missing numbers so that $3 \times b - a = 2$

a	b
4	2
13	5

2 marks

$3 \times b - a = 2$

$3 \times 2 - 4 = 2$

$3 \times 5 - 13 = 2$

Remember the order of operations BIDMAS

26 Here are 3 translations on a coordinate grid.

Tick the translations that are **four units to the left.**

from (0, 2) to (4, 2) ☐

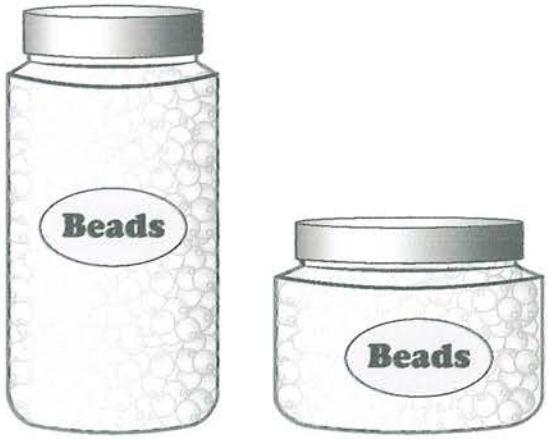
from (6, 8) to (2, 8) ☑

from (–3, 5) to (–7, 5) ☑

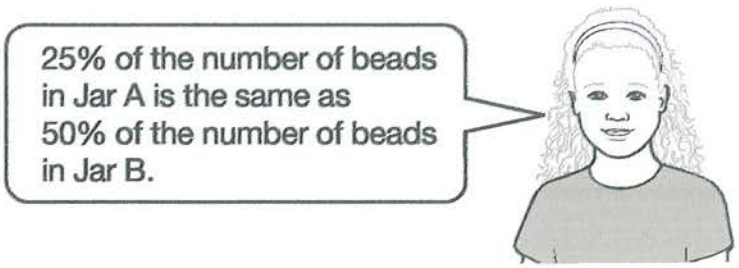
1 mark

27 Olivia has two jars of beads.

The number of beads in Jar A is **double** the number of beads in Jar B.



Olivia says,



Explain why Olivia is correct.

If there are 100 beads in Jar A there would be 50 in jar B.

25% of 100 = 25

50% of 50 = 25

1 mark

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Standards & Testing Agency

2024 key stage 2 mathematics
Paper 2: reasoning
Print version product code: STA/24/8818/p ISBN: 978-1-83507-012-3
Electronic PDF version product code: STA/24/8818/e ISBN: 978-1-83507-033-8

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