

2022 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.

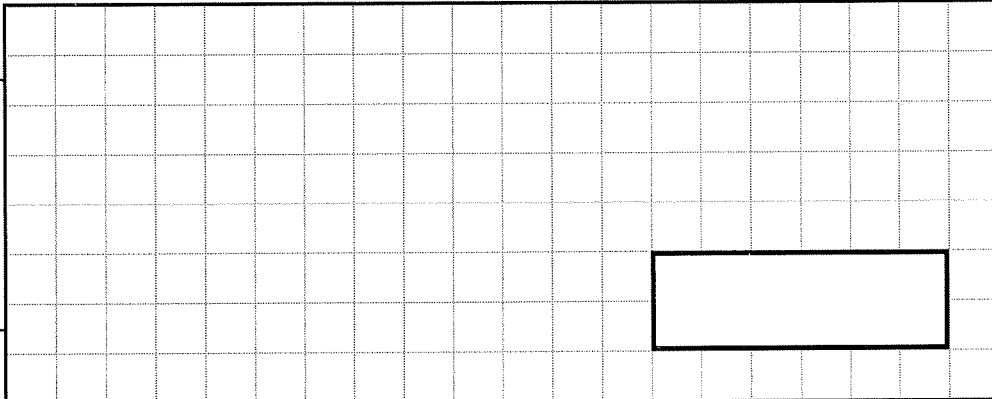
Work as quickly and as carefully as you can.

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:

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 **greatest** number.

9,206,499

9,215,300

9,206,504

9,215,298

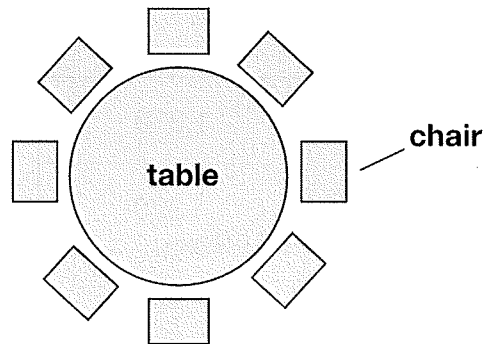
9,206,909

1 mark



2

One table can seat 8 people.



How many tables are needed to seat 40 people?

$$8 \overline{)40} \begin{array}{r} 5 \\ \end{array}$$

5 tables

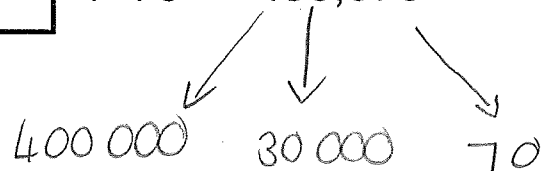
1 mark

3

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

$$400,000 + \boxed{30\,000} + 70 = 430,070$$

1 mark



4

Children estimated the number of beans in a jar.

These were the estimates of five children.

Amir	1,310
Olivia	1,220
Emma	1,400
John	1,290
Chen	1,460

The exact number of beans in the jar was **1,380**

Whose estimate was **closest** to the exact number?

Emma

1 mark

Whose estimate was **furthest** from the exact number?

$$\begin{array}{r}
 3 \\
 1460 \\
 - 1380 \\
 \hline
 80
 \end{array}
 \quad
 \begin{array}{r}
 1380 \\
 - 1220 \\
 \hline
 0160
 \end{array}$$

Olivia

1 mark



5

One tonne is 1,000 kilograms.

A truck can carry a load of 2.3 tonnes.

How many **kilograms** can the truck carry?

$$2.3 \times 1000$$

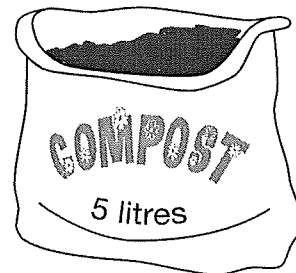
2300 kg

1 mark

$$\begin{array}{r} 2300. \\ \hline \end{array}$$

6

Emma has a 5 litre bag of compost.



She uses 2.75 litres.

How much compost does Emma have left?

$$\begin{array}{r} 49 \\ 5.00 \\ - 2.75 \\ \hline 2.25 \end{array}$$

2.25 litres

1 mark



7

In a race, Ali completes a swim, a run and a bicycle ride.

The swim is $\frac{1}{10}$ of the total distance.

The run is $\frac{3}{10}$ of the total distance.

What fraction of the total distance is the **bicycle ride**?

$$\frac{10}{10} - \frac{1}{10} = \frac{9}{10}$$

$$\frac{9}{10} - \frac{3}{10} = \frac{6}{10}$$

$$\frac{6}{10}$$

1 mark

8

Circle the improper fraction that is equivalent to $2\frac{3}{8}$

$$\frac{5}{8}$$

$$\frac{14}{8}$$

$$\frac{19}{8}$$

$$\frac{23}{8}$$

$$\frac{26}{8}$$

1 mark

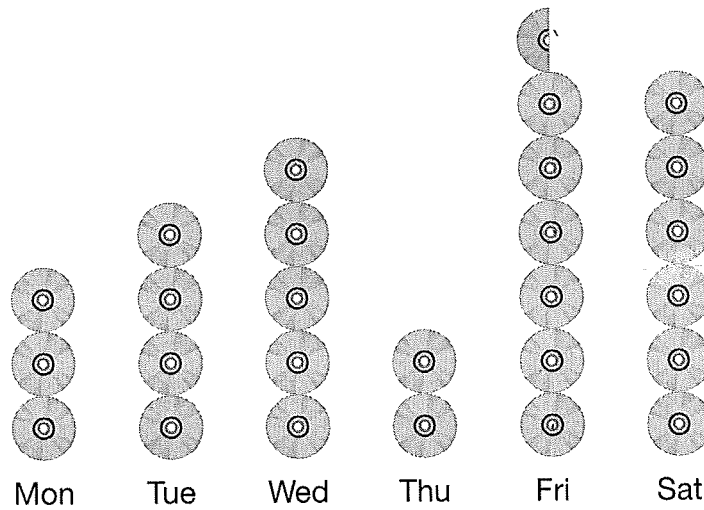
$$2 \times 8 = 16$$

$$16 + 3 = 19$$



9

This pictogram shows how many DVDs a shop sells in one week.



On **Monday**, 24 DVDs were sold.

How many DVDs were sold on **Friday**?

$$3 \overline{)24} \quad 8$$

$$8 \div 2 = 4$$

52

1 mark

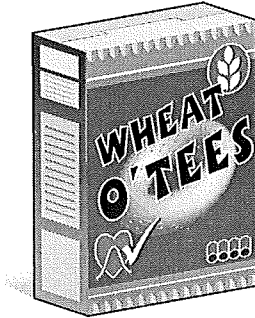
$$8 \times 6 = 48$$

$$48 + 4 = 52$$



10

A shop has an offer.



Buy one box for £1.90

Get the second box half price.

Ali buys two boxes of cereal.

How much must he pay **altogether**?

Show
your
method

	0.95				
	211.90				
	1.90				
	+ 0.95				
	2.85				

£ 2.85

2 marks



11

Write the missing values.

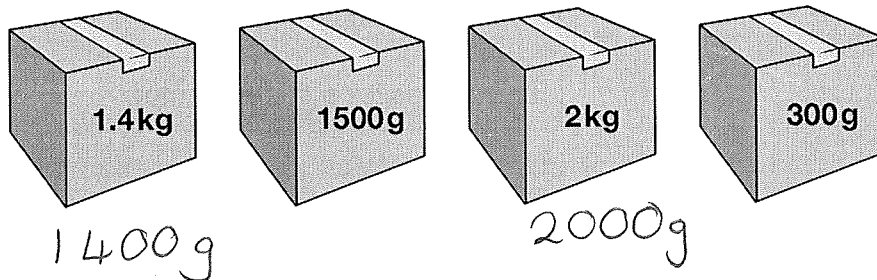
$$\frac{3 \times 2}{10 \times 2} = \frac{\boxed{6}}{20}$$

$$\frac{12 \div 3}{15 \div 3} = \frac{4}{\boxed{5}}$$

1 mark

12

William has four parcels.

Write the masses in order, starting with the **heaviest**.

1 mark

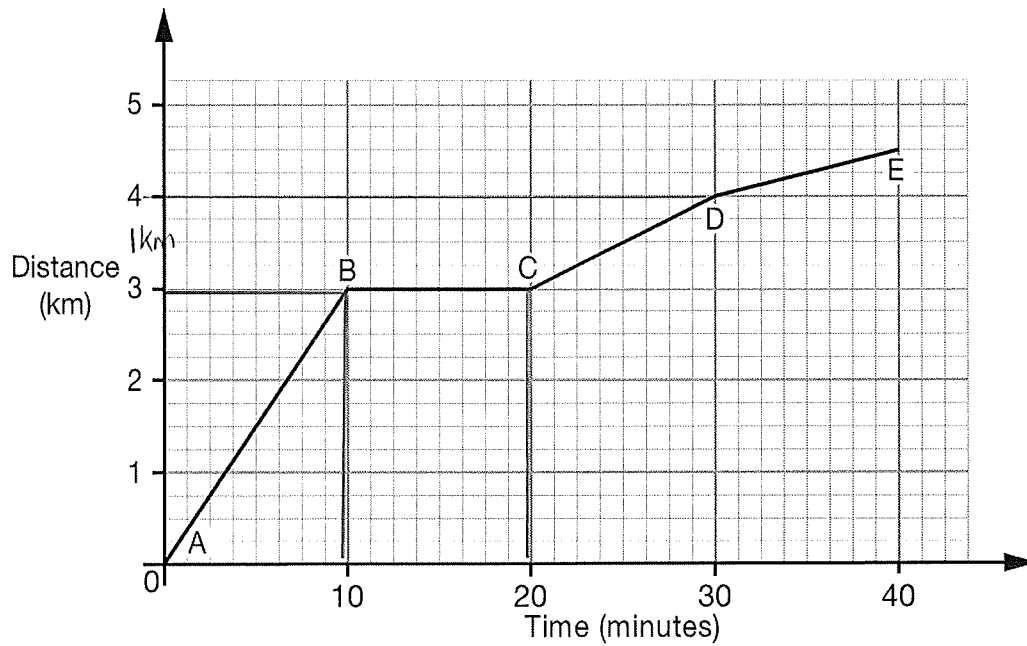
heaviest



K 0 0 0 7 0 A 0 1 1 2 4

13

Look at the graph below that shows Dev's bike ride.



Match each part of Dev's journey to the correct sentence.

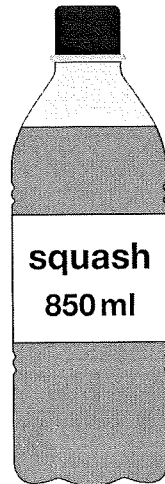
A to B	Dev rests for 10 minutes.
B to C	Dev cycles 1 km in 10 minutes.
C to D	Dev cycles 3 km in 10 minutes.
D to E	Dev cycles less than 1 km in 10 minutes.

1 mark



14

This 850ml bottle of squash makes 17 drinks.



How many millilitres of squash are in each drink?

$$\begin{array}{r} 50 \\ 17 \overline{) 850} \end{array}$$

17.
34.
51.
68.
85.

50 ml

1 mark

15

Write the correct sign =, > or < in each box.

$$1 \times 2 \times 3$$

(6)

=

$$1 + 2 + 3$$

(6)

$$2 \times 2 \times 2$$

(4 x 2 = 8)

>

$$2 + 2 + 2$$

(6)

$$1 \times 10 \times 10$$

(100)

>

$$1 + 10 + 10$$

21

$$0 \times 10 \times 10$$

0

<

$$0 + 10 + 10$$

20

2 marks



K 0 0 0 7 0 A 0 1 3 2 4

16

Tick the numbers that round to 28.7

\uparrow
28.07
28.1

\uparrow
28.65
28.7

\downarrow
28.71
28.7

\uparrow
28.75
28.8

28.97
29.0

1 mark

17

6 divides into 40 with a remainder of 4

Write **one** other number that divides into 40 with a remainder of 4

$$9 \times 4 = 36$$

1 mark



18

This sign shows the number of **empty spaces** on each level of a car park at 10 am.

P	Empty Spaces
Level 2	511
Level 1	268

In this car park, **each** level has 800 spaces.

What is the total number of cars **parked** in the car park at 10 am?

Show your method

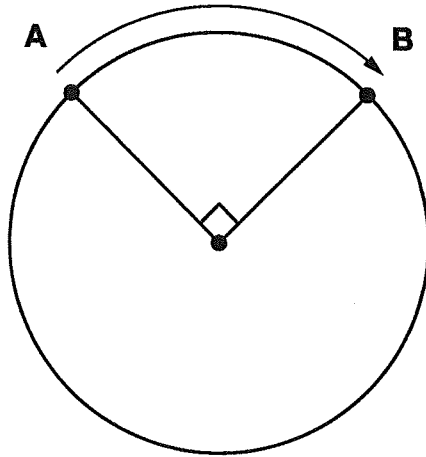
$\begin{array}{r} 79 \\ 800 \\ - 511 \\ \hline 289 \end{array}$	$\begin{array}{r} 79 \\ 800 \\ - 268 \\ \hline 532 \end{array}$	$\begin{array}{r} 532 \\ + 289 \\ \hline 821 \end{array}$
		<div style="border: 1px solid black; padding: 5px; display: inline-block;">821</div>

2 marks



19

The **circumference** of this circle is 60 centimetres.



Not
actual
size

What is the distance around the edge of the circle from **A** to **B**?

$$\begin{array}{r} 15 \\ 4 \overline{)60} \end{array}$$

15 cm

1 mark



20

There are 432 places at a dance school.

There are two age groups.

This table shows the number of classes and the number of pupils in each class for each age group at the moment.

Age in years	Number of classes	Number of pupils in each class
7-12	15	16
13-18	10	18

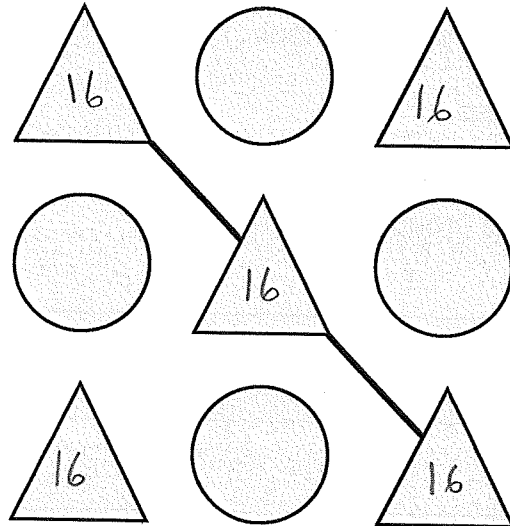
How many more pupils can join the dance school?

Show your method

$\begin{array}{r} 15 \\ \times 16 \\ \hline 90 \\ 150 \\ \hline 240 \end{array}$	$\begin{array}{r} 18 \\ \times 10 \\ \hline 00 \\ 180 \\ \hline 180 \end{array}$	$\begin{array}{r} 180 \\ + 240 \\ \hline 420 \end{array}$	$\begin{array}{r} 432 \\ - 420 \\ \hline 012 \end{array}$
			12

2 marks





Each shape stands for a number.

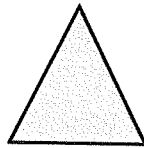
The total of the shapes on the diagonal line is 48

The total of all the shapes is 200

Calculate the value of each shape.

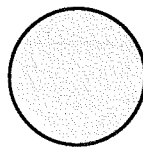
$$\begin{array}{r} 16 \\ 3 \overline{)48} \\ \underline{30} \\ 18 \\ \underline{18} \\ 0 \end{array}$$

$$\begin{array}{r} 200 \\ - 80 \\ \hline 120 \\ 4 \overline{)120} \\ \underline{80} \\ 40 \\ \underline{40} \\ 0 \end{array}$$



=

1 mark



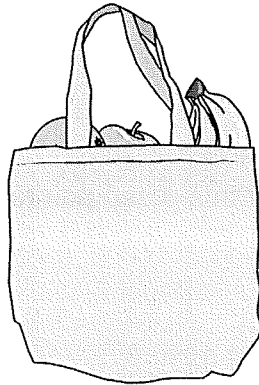
=

1 mark



23

Adam has a bag of fruit that weighs **1.25 kilograms**.



He takes out a banana. Now the bag of fruit weighs **1.1 kg**.

Next, he takes out an orange. Now the bag weighs **920 g**.

How much **more** does the orange weigh than the banana?

Show
your
method

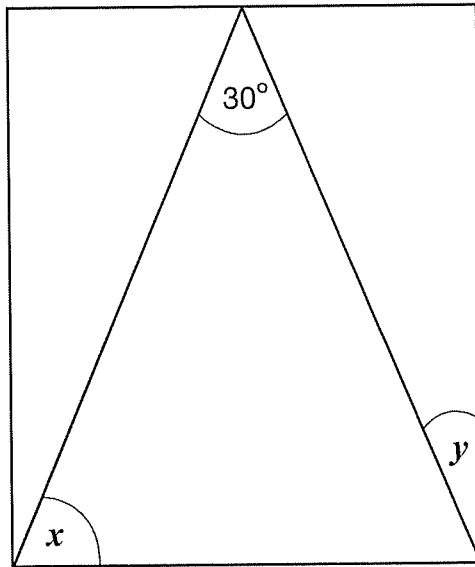
		0'0	
	1.25	1400	180
-	1.10	- 920	- 150
	<u>0.15</u>	<u>180</u>	<u>30</u>
	Banana = 150g		
	Orange = 180g		
			30 g

2 marks



24

Here is an **isosceles** triangle inside a rectangle.



Not to scale

Calculate the sizes of angles x and y .

Show your method

180	75	90	
- 30	2150	- 75	
150		15	
$x = 75^\circ$		$y = 15^\circ$	

2 marks

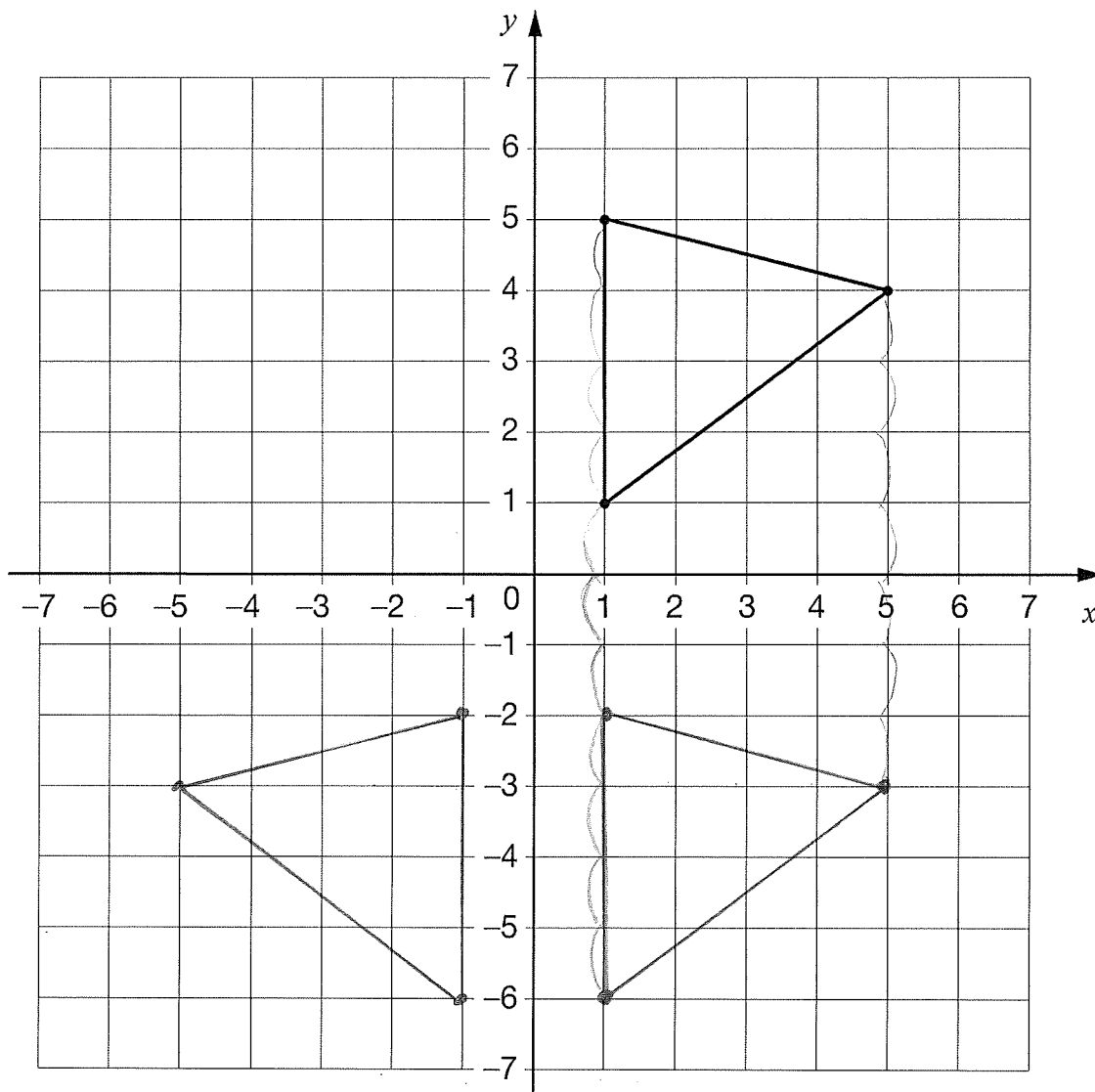


25

The triangle is to be transformed on the grid as follows:

- First translate the shape 7 units down.
- Then reflect the **resulting** triangle in the y -axis.

Draw the new triangle on the grid after **each** transformation.



Use a ruler.

2 marks



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Agency

2022 key stage 2 mathematics

Paper 2: reasoning

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