

2018 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:

Diagram illustrating a method box. A rounded rectangle on the left contains the text "Show your method". This is connected to a large grid of red lines. Inside the grid, on the right side, is a smaller empty rectangular box.

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.

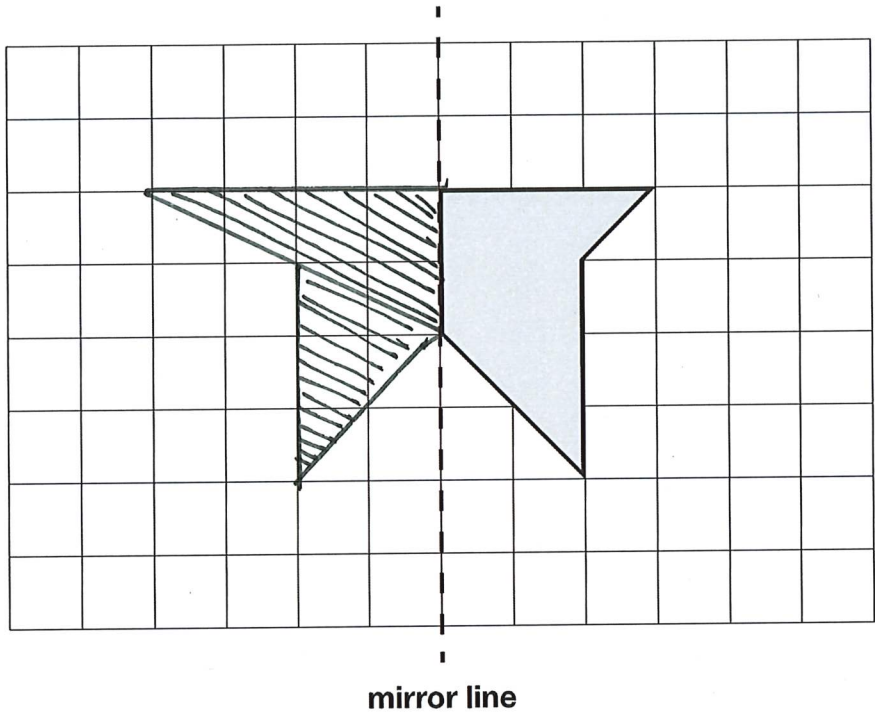


1

Here is a shape on a grid.

Complete the design so that it is symmetrical about the mirror line.

Use a ruler.



1 mark



2

Stefan completes this calculation.

$$\begin{array}{r} 95 \\ - 67 \\ \hline 28 \end{array}$$

Write an **addition** calculation he could use to check his answer.

$$\begin{array}{r} 95 \\ + 67 \\ \hline 28 \end{array}$$

1 mark



3

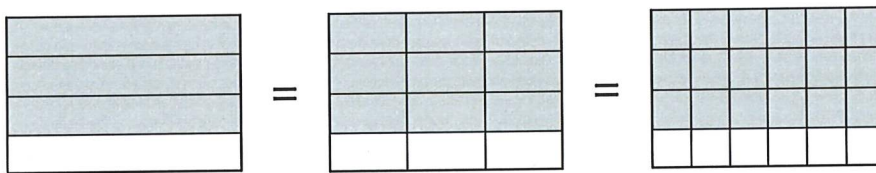
On the line below, mark the point that is 6.7 centimetres from A.



1 mark

4

These diagrams show three equivalent fractions.



Write the missing values.

$$\frac{3}{4} = \frac{9}{\boxed{4}} = \frac{\boxed{24}}{24}$$

1 mark



5

Here are the temperatures in four cities at midnight and at midday.

City	Temperature	
	At midnight	At midday
Paris	-4°C	-2°C
Oslo	-13°C	-7°C
Rome	3°C	10°C
Warsaw	-6°C	2°C

At **midnight**, how many degrees colder was Paris than Rome?

2 degrees

1 mark

Which city was 6 degrees colder at midnight than at midday?

-13°C

1 mark



6

The numbers in this sequence **decrease** by the same amount each time.

$303,604$ $302,604$ $301,604$ $300,604$...

Handwritten annotations: arcs between terms with "-1000" written above them.

What is the next number in the sequence?

$$\begin{array}{r}
 300,604 \\
 - 1,000 \\
 \hline
 301,604
 \end{array}$$

301,604

1 mark

7

Tick the **two** numbers that are equivalent to $\frac{1}{4}$

Tick **two**.

0.25

0.75

$\frac{25}{100}$

0.5

$\frac{2}{5}$

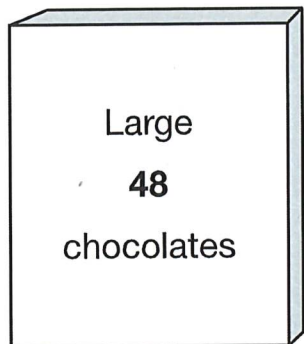
1 mark



8

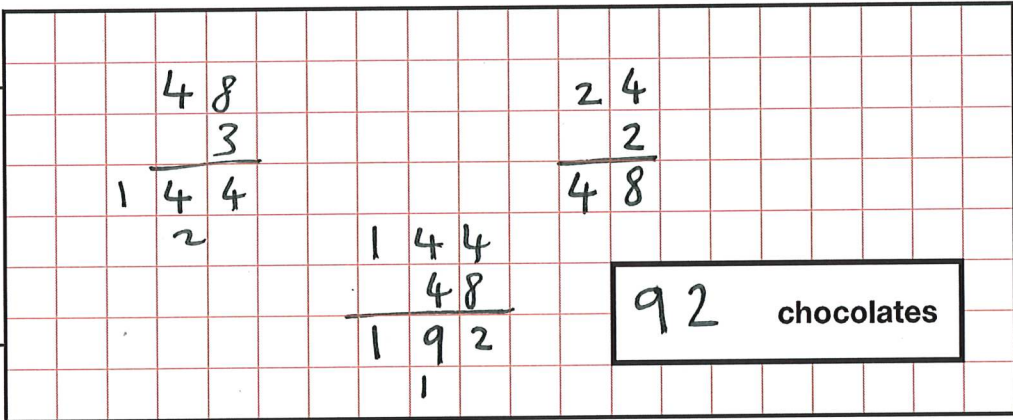
Ken buys 3 large boxes and 2 small boxes of chocolates.

Each large box has 48 chocolates. Each small box has 24 chocolates.



How many **chocolates** did Ken buy altogether?

Show your method



The grid contains handwritten calculations:

- On the left, a vertical addition:
$$\begin{array}{r} 48 \\ + 3 \\ \hline 51 \end{array}$$
 Below this is 144 with a small 2 written below it.
- In the middle, a vertical addition:
$$\begin{array}{r} 144 \\ + 48 \\ \hline 192 \\ + 1 \end{array}$$
- On the right, a vertical addition:
$$\begin{array}{r} 24 \\ + 2 \\ \hline 26 \end{array}$$
 Below this is 48 .
- To the right of the middle calculation, there is a boxed answer: 92 chocolates.

2 marks



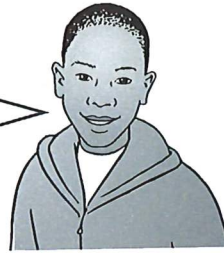
9

The list below shows the years in which the Cricket World Cup was held since 1992:

1992, 1996, 1999, 2003, 2007, 2011, 2015

Adam says,

The Cricket World Cup has been held every four years since 1992.



Adam is **not** correct.

Explain how you know.

1992 to 1996 is 4 years
but 1996 to 1999. is
3 years

1 mark





Write the correct symbol in each box to make the statements correct.

$$\begin{array}{r} 144 \\ 11 \times 12 \end{array}$$



$$\begin{array}{r} 150 \\ 15 \times 10 \end{array}$$

$$\begin{array}{r} 3 \\ 90 \div 30 \end{array}$$



$$\begin{array}{r} 3 \\ 60 \div 20 \end{array}$$

$$\begin{array}{r} 30 \\ 120 \div 4 \end{array}$$



$$\begin{array}{r} 20 \\ 160 \div 8 \end{array}$$

$$\begin{array}{r} 30 \times 8 \\ 2400 \end{array}$$



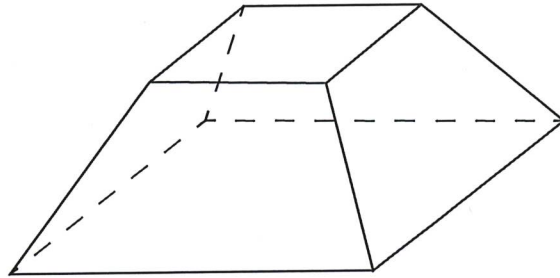
$$\begin{array}{r} 100 \times 10 \\ 1000 \end{array}$$

2 marks



11

Here is a drawing of a 3-D shape.



Complete the table.

Number of faces	Number of vertices	Number of edges
8	12	6

2 marks



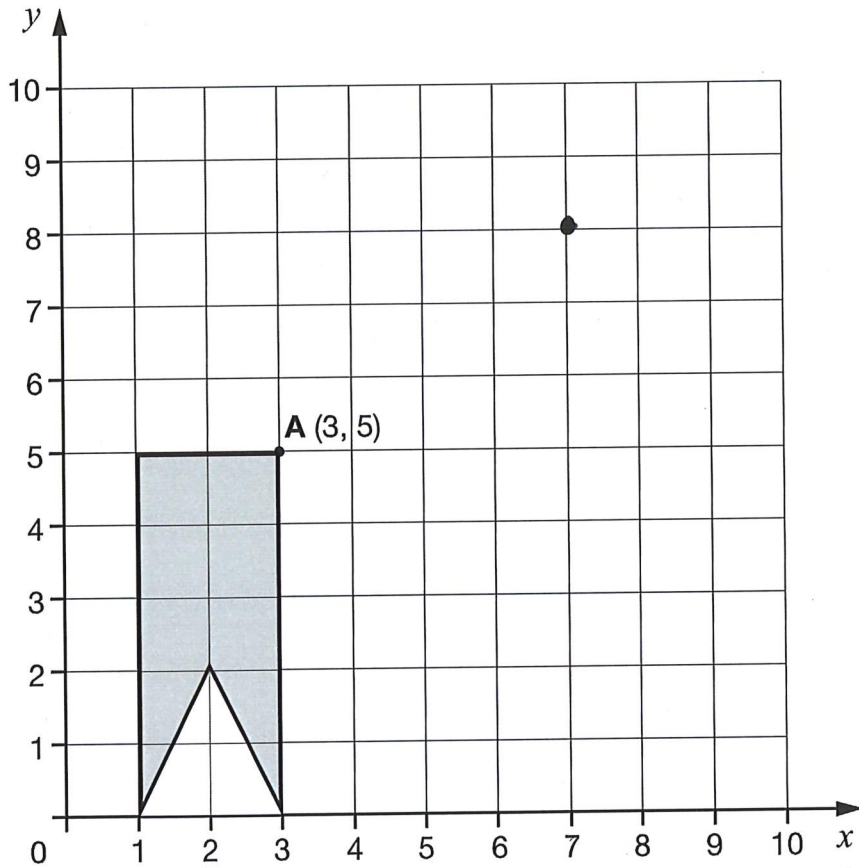
12

Here is a shape on a grid.

The shape is translated so that point **A** moves to $(7, 8)$.

Draw the shape in its new position.

Use a ruler.



1 mark



13

Circle the improper fraction that is equivalent to $6\frac{7}{8}$

$\frac{67}{8}$

$\frac{48}{8}$

$\frac{62}{8}$

$\frac{55}{8}$

$\frac{76}{8}$

1 mark

$6 \times 8 = 48$

$48 + 7 = 55$

14

$\frac{6}{5}$

$\frac{3}{5}$

$\frac{3}{4}$

Write these fractions in order, starting with the **smallest**.

$\frac{3}{4}$

smallest

$\frac{3}{5}$

$\frac{6}{5}$

1 mark

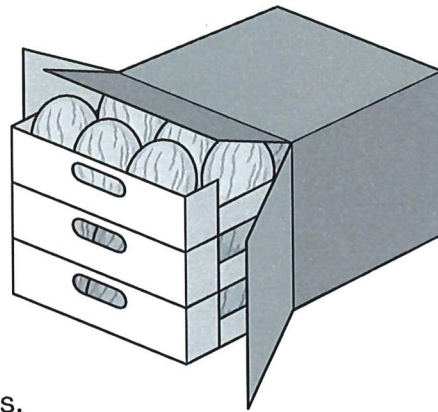


15

A box contains trays of melons.

There are 15 melons in a tray.

There are 3 trays in a box.



A supermarket sells **40** boxes of melons.

How many melons does the supermarket sell?

Show
your
method

$$\begin{array}{r} \times 15 \\ 3 \\ \hline 45 \\ 1 \end{array}$$

$$\begin{array}{r} + 45 \\ 40 \\ \hline 85 \end{array}$$

85 melons

2 marks



16

Adam wants to use a mental method to calculate $182 - 97$

He starts from 182

Here are some methods that Adam could use.

Tick the methods that are **correct**.

add 3 then subtract 90

subtract 100 then add 3

subtract 7 then subtract 90

subtract 3 then subtract 100

2 marks



17

There are 28 pupils in a class.

The teacher has 8 litres of orange juice.

She pours 225 millilitres of orange juice for every pupil.



How much orange juice is left over?

Show
your
method

$$\begin{array}{r} 28 \\ \times 8 \\ \hline 224 \\ 6 \end{array} \quad \begin{array}{r} 225 \\ - 224 \\ \hline 001 \end{array}$$

1

3 marks



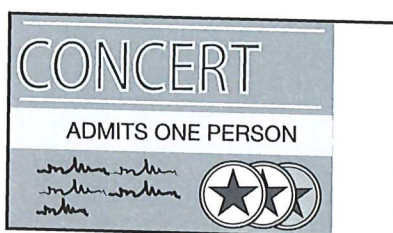
18

Last year, Jacob went to four concerts.

Three of his tickets cost £5 each.



The other ticket cost £7



What was the **mean** cost of the tickets?

Show
your
method

$$5 + 5 + 5 + 7 = 22$$
$$\begin{array}{r} 04r2 \\ 5 \overline{)22} \\ \underline{5} \\ 2 \\ \underline{2} \\ 0 \end{array}$$

£ 4r2

2 marks



19

Layla wants to estimate the answer to this calculation.

$$3\overset{4}{\frac{9}{10}} - 2\overset{2}{\frac{1}{8}} + 1\overset{3}{\frac{4}{5}}$$

Tick the calculation below that is the best estimate.

Tick **one**.

$3 - 2 + 2$

$4 - 2 + 1$

$4 - 2 + 2$

$3 - 2 + 1$

1 mark

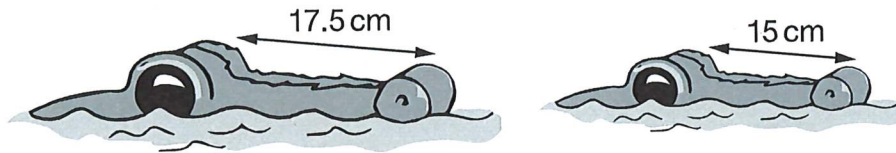


20

The length of an alligator can be estimated by:

- measuring the distance from its eyes to its nose
- then multiplying that distance by 12

What is the **difference** in the estimated lengths of these two alligators?



Not to scale

Show your method

$$\begin{array}{r} 17.5 \\ - 15.0 \\ \hline 02.5 \end{array}$$

2.5 cm

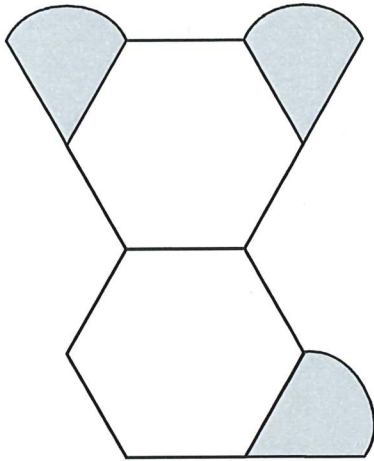
2 marks



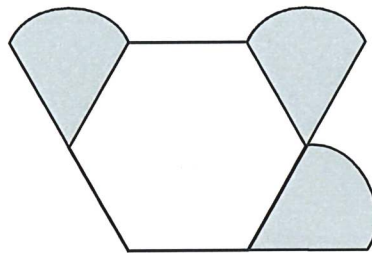
21

Amina is making designs with two different shapes.

She gives each shape a value.



Total value is 147

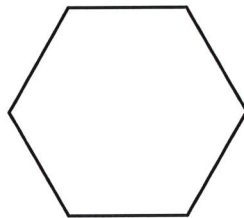


Total value is 111

Calculate the value of each shape.

$$\begin{array}{r} 147 \\ - 111 \\ \hline 036 \end{array}$$

$$\begin{array}{r} 0 \times \times 1 \\ - 36 \\ \hline 75 \end{array}$$



$$= \boxed{36}$$

1 mark



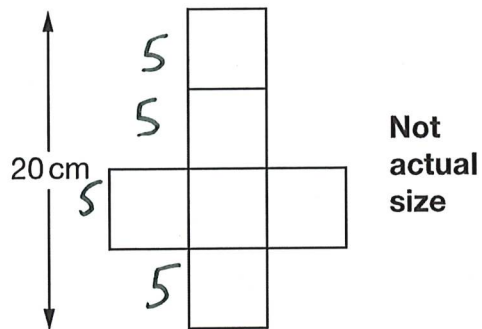
$$= \boxed{75}$$

1 mark



22

This is the net of a cube.



What is the **volume** of the cube?

125 cm³

1 mark

$$5 \times 5 \times 5$$



23

The length of a day on Earth is 24 hours.

The length of a day on Mercury is $58\frac{2}{3}$ times the length of a day on Earth.

What is the length of a day on Mercury, in hours?

Show your method

58×24

$\frac{2}{3} \times 24 = 16$

$58 \times 24 = 1160$

$8 \times 24 = 192$

$1160 + 192 = 1352$

$1352 + 16 = 1368$

$1368 + 16 = 1384$

$1384 + 16 = 1400$

$1400 + 8 = 1408$

1408 hours

2 marks





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Paper 2: reasoning

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