2023 national curriculum tests

Key stage 2

Mathematics

Paper 1: arithmetic

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

.CG Maths.
Worked Solutions

Please note that these worked solutions have neither been provided nor approved by the Standards and Testing Agency and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

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Instructions

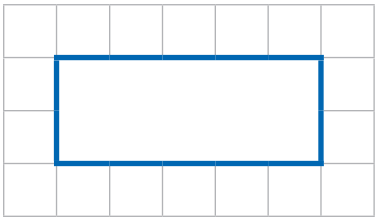
You **must not** use a calculator to answer any questions in this test.

Questions and answers

You have **30 minutes** to complete this test.

Work as quickly and as carefully as you can.

Put your answer in the box for each question.



All answers should be given as a single value.

For questions expressed as common fractions or mixed numbers, you should give your answer as a common fraction, a mixed number or a whole number as appropriate.

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 box at the side of the page tells you the number of marks available for each question.

In this test, long division and long multiplication questions are worth **2 marks each**. You will be awarded **2** marks for a correct answer.
You may get **1** mark for showing a formal method.

All other questions are worth **1 mark each**.

1 707 – 10 =

$$\begin{array}{r} {}^{6}\cancel{7}\,{}^{1}0\,7 \\ -\quad 1\,0 \\ \hline 6\,9\,7 \end{array}$$

697

1 mark

2 6594 = 6,138 + 456

$$\begin{array}{r} 6\,1\,3\,8 \\ +\quad 4\,5\,6 \\ \hline 6\,5\,{}^{1}9\,4 \end{array}$$

1 mark

3 4 × 702 =

$$\begin{array}{r} 7\,0\,2 \\ \times\quad 4 \\ \hline 2\,8\,0\,8 \end{array}$$

2808

1 mark

4 8413 = 8,005 + 408

```
  8 0 0 5
+   4 0 8
-------
  8 4 1 3
```

1 mark

5 2 × 4 × 30 =

2 x 4 = 8. Then 8 x 3 = 24 so 8 x 30 = 240

240

1 mark

6 960 = 10 × 96

To multiply a whole number by 10, a 0 can be added on the end

1 mark

7 7.8 + 6.953 =

	7	. 8	0	0
+	6	. 9	5	3
1	4	. 7	5	3
	1			

Where there is nothing in the decimal places after the decimal point, 0s can be added

14.753

1 mark

8 2754 = 8,217 – 5,463

	7 8	11 2	1	7
–	5	4	6	3
	2	7	5	4

1 mark

9 450 ÷ 9 =

	0	5	0
9	4	4 5	0

50

1 mark

10 $8 \times 65 =$

$$\begin{array}{r} 65 \\ \times \quad 8 \\ \hline 520 \end{array}$$

$\boxed{520}$

1 mark

11 $2{,}800 \div 7 =$

$$7\overline{)2800} = 0400$$

$\boxed{400}$

1 mark

12 $801 - \boxed{6} = 795$

$$\begin{array}{r} 801 \\ -\ 795 \\ \hline 6 \end{array}$$

This works out the difference between 801 and 795 and therefore what must be subtracted

1 mark

13 2,700 ÷ 3 =

0 9 0 0
3 | 2 ²7 0 0

900

1 mark

14 $\frac{2}{7} \times \frac{5}{9} =$

To multiply fractions, the numerators and denominators can be multiplied. 2 x 5 = 10 and 7 x 9 = 63

$\frac{10}{63}$

1 mark

15 747 ÷ 9 =

0 8 3
9 | 7 ⁷4 ²7

83

1 mark

16 $\frac{3}{16} + \frac{5}{8} =$

$\frac{3}{16} + \frac{10}{16}$

To add fractions, the denominators need to be the same. Multiplying both the numerator and denominator of 5/8 by 2 converts it into 10/16, which is an equivalent fraction with the same denominator as 3/16. Then the numerators can be added and the denominator stays the same

$\frac{13}{16}$

1 mark

17 $0.3 \div 10 =$

To divide a decimal by 10, the decimal point can be moved once to the left

0.03

1 mark

18 $\frac{1}{3} + \frac{2}{6} + \frac{5}{18} =$

$\frac{6}{18} + \frac{6}{18} + \frac{5}{18}$

To add fractions, the denominators need to be the same. Multiplying both the numerator and denominator of 1/3 by 6 and both the numerator and denominator of 2/6 by 3 converts them both into equivalent fractions with the same denominator as 5/18. Then the numerators can be added and the denominator stays the same

$\frac{17}{18}$

1 mark

19 29.5 – 16.125 =

```
  29.5010
- 16.125
  13.375
```

Where there is nothing in the decimal places after the decimal point, 0s can be added

13.375

1 mark

20

```
   508
×   74
  2032
 3560
 37592
```

A 0 must be added onto the second line when doing 508 x 7

Show your method

37592

2 marks

21 $\frac{1}{8} \div 3 =$

Multiplying the denominator by 3 divides the fraction by 3 as the 1 is being divided by 3 times the amount

$\frac{1}{24}$

1 mark

22 $1 + \frac{2}{7} + \frac{5}{7} =$

2/7 + 5/7 = 7/7 = 1. Then 1 + 1 = 2

2

1 mark

23 $70 + 48 \div 6 =$

The order of operations (BIDMAS) needs to be followed so the division is done first. 48 ÷ 6 = 8. Then 70 + 8 = 78

78

1 mark

24 $3.2 \times 12 =$

$$\begin{array}{r} 3.2 \\ \times\ 12 \\ \hline 64 \\ 320 \\ \hline 38.4 \end{array}$$

Ignoring the decimal point then putting it back in at the end. Adding a 0 on the second line

38.4

1 mark

25

Show your method

$$\begin{array}{r} 013 \\ 47\overline{)611^{14}1} \end{array}$$

$$\begin{array}{r} 94 \\ 141 \end{array}$$

Listing out the 47 times table helps with the division

13

2 marks

26 5,746 ÷ 5 =

```
    1 1 4 9 . 2
5 | 5 7 ²4 ⁴6 ¹0
```

Carrying the remainder of 1 to the next decimal place, where there is currently a 0

1149.2

1 mark

27 52% of 700 =

```
    5 2
x     7
  3 6 4
```

Percentage is out of 100 so dividing the 700 by 100 works out that 1% of 700 is 7. Multiplying this by the 52 works out 52% of 700

364

1 mark

28 $\frac{1}{3} \div 6 =$

Multiplying the denominator by 6 divides the fraction by 6 as the 1 is being divided by 6 times the amount

$\frac{1}{18}$

1 mark

29

$$\begin{array}{r} 5227 \\ \times \quad 43 \\ \hline 15681 \\ 209080 \\ \hline 224761 \end{array}$$

Adding a 0 on the second line

Show your method

224761

2 marks

30 95% of 180 =

$$\begin{array}{r} 1\,{}^{7}8\,{}^{1}0 \\ -\quad 9 \\ \hline 1\,7\,1 \end{array}$$

95% is 5% less than 100%, which is the whole amount. 10% as a fraction is 1/10 so dividing the 180 by 10 finds that 10% of 180 is 18. Halving this works out that 5% of 180 is 9. Subtracting the 9 from the 180 reduces it by 5%

171

1 mark

31 0.4 × 37 =

$$\begin{array}{r} 3\,7 \\ \times\ 0.4 \\ \hline 1\,{}_{2}4.8 \end{array}$$

14.8

1 mark

32

$1 - \boxed{\frac{3}{10}} = \frac{7}{10}$

1 = 10/10. Then 10/10 - 7/10 works out the difference and therefore what needs to be subtracted

1 mark

33

Show your method

```
        1 7 2
2 6 | 4 4 18 7 5 2
      5 2
      - -
      7 8
1 0 4
1 3 0
1 5 6
1 8 2
```

Listing out the 52 times table helps with the division

$\boxed{172}$

2 marks

34 $2\frac{5}{6} - \frac{3}{4} =$

$\frac{10}{12} - \frac{9}{12}$

To subtract fractions, the denominators need to be the same. Multiplying both the numerator and denominator of 5/6 by 2 gives 10/12 and multiplying both the numerator and denominator of 3/4 by 3 gives 9/12. These can then be subtracted by subtracting the numerators and the denominator stays the same. In this case, the 2 stays the same

$2\frac{1}{12}$

1 mark

35 38% of 750 =

```
     7.5
   × 38
   600
  225
  285.0
```

Dividing the 750 by 100 by moving the decimal place twice to the left finds that 1% of 750 is 7.5. Multiplying this by 38 finds 38% of 750

285

1 mark

36 $\frac{2}{3} \times 900 =$

```
   300
3 | 900

   300
×    2
   600
```

To multiply an amount by a fraction, divide the amount by the denominator then multiply the result by the numerator

600

1 mark

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