AQA

.CG Maths.
Hints

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

# GCSE MATHEMATICS

**F**

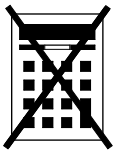
Foundation Tier Paper 1 Non-Calculator

Time allowed: 1 hour 30 minutes

## Materials

For this paper you must have:
- mathematical instruments.

You must **not** use a calculator.



## Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.

## Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

## Advice

In all calculations, show clearly how you work out your answer.

| For Examiner's Use | |
|---|---|
| Pages | Mark |
| 2–3 | |
| 4–5 | |
| 6–7 | |
| 8–9 | |
| 10–11 | |
| 12–13 | |
| 14–15 | |
| 16–17 | |
| 18–19 | |
| 20–21 | |
| 22–23 | |
| 24–25 | |
| 26 | |
| **TOTAL** | |

**Please note that these worked solutions have neither been provided nor approved by AQA 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

**.CG Maths.**

Answer **all** questions in the spaces provided.

*Do not write outside the box*

**1** Circle the answer to $0.02 \times 100$

**[1 mark]**

0.2 2 20 200

Moving the decimal point twice to the right multiplies it by 100

**2** Circle the expression that is equal to $x + x + x - x + x$

**[1 mark]**

$x$ $2x$ $3x$ $4x$

1 + 1 + 1 - 1 + 1 = ? so there are ?x

**3** What is 260 millimetres in centimetres?

Circle your answer.

**[1 mark]**

0.26 cm 2.6 cm 26 cm 2600 cm

There are 10 millimetres in 1 centimetre

*Do not write outside the box*

**4** Which shape **can** have sides with lengths that are all different?

Circle your answer.

**[1 mark]**

trapezium kite parallelogram rhombus

All are four sided shapes. Trapezium: one pair of parallel sides. Kite: two pairs of equal sides which are next to each other. Parallelogram: two pairs of equal sides which are opposite and parallel to each other. Rhombus: all sides are equal

**5** Work out $(-8) \times 5$

**[1 mark]**

Answer _____

8 x 5 = 40 so this will be the same but negative

**Turn over for the next question**

5

*Do not write outside the box*

**6** Luke buys 4 apples and 5 bananas.

The total cost is £3.70

Each apple costs 35p

Work out the cost in pence of each banana.

**[4 marks]**

Work out the cost of 4 apples by multiplying 35p by 4. Subtracting the cost of the 4 apples from the total cost in pence leaves the cost of the 5 bananas. There is 100 pence in a pound. Dividing the cost of 5 bananas by 5 works out the cost of each banana

Answer _____ pence

*Do not write outside the box*

**7** Rashid counted the pieces of homework he had done in three subjects.

He draws a pictogram to show the results.

**Key:** ⊕ represents 4 pieces of homework

| | |
|---|---|
| **Maths** | ⊕ ⊕ ⊕ ⊕ ⊕ |
| **English** | ⊕ ⊕ ⊕ ◁ |
| **Geography** | |

**7 (a)** Rashid had done 5 pieces of Geography homework.

Show this information on the pictogram.

**[1 mark]**

Each quarter of a symbol represents 1 piece of homework.
So 5 quarters represents 5 pieces of Geography homework

**7 (b)** Rashid spent 30 minutes on each piece of homework.

Work out the **total** time he spent on homework for these three subjects.

Give your answer in hours and minutes.

**[3 marks]**

Each quarter of a symbol represents 1 piece of homework. Count the number of quarter symbols for Maths and English. There are 5 pieces of homework for Geography. Adding these all together gives the total number of pieces of homework. 30 minutes is half of an hour so doing 1/2 x (the total number of pieces of homework) works out how many hours he spent on homework. Convert any fraction or decimal of an hour into minutes by considering that there are 60 minutes in an hour

Answer _____ hours _____ minutes

8

*Do not write outside the box*

**8** A travel company is taking some passengers on a trip.

They can use coaches or minibuses.

Each coach can carry 53 passengers.

Each minibus can carry 12 passengers.

The passengers going on the trip would exactly fill 3 coaches.

If the company uses only minibuses, how many will they need?

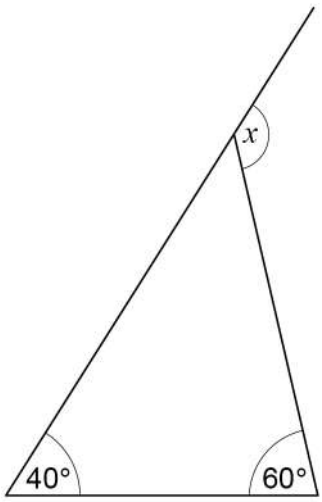
**[4 marks]**

53 x 3 works out how many passengers there are in total. Dividing this by 12 works out how many minibuses are needed. There is a remainder so an extra minibus will be needed for these

Answer _____

*Do not write outside the box*

**9** One side of a triangle is extended.




Not drawn accurately

Circle the size of angle $x$.

**[1 mark]**

100° 80° 60° 40°

There are 180° in a triangle. There are 180° around a point on a straight line

**10** Pavel uses his calculator to work out $352 \times 7268$

Circle the **last** digit in the answer.

**[1 mark]**

0 2 6 8

We do not need to do the whole calculation. Consider the two last digits multiplied together. Whatever this ends in will be what the whole calculation ends in

**Turn over for the next question**

6

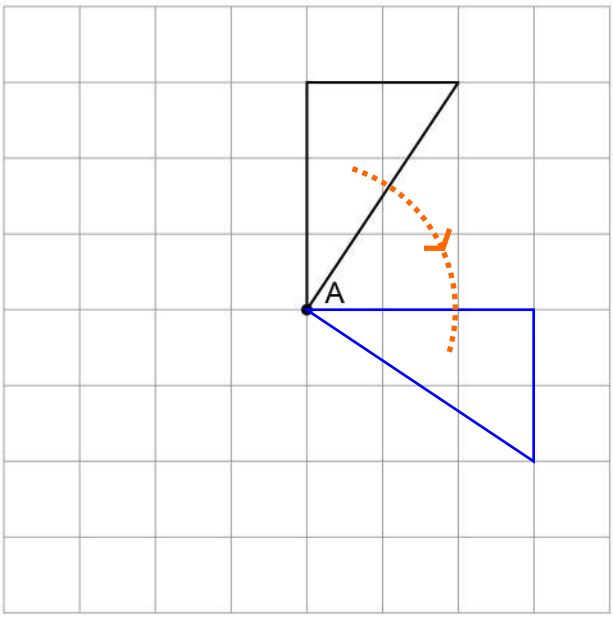
*Do not write outside the box*

**11** Complete the diagram so that it has

rotational symmetry of order 4

centre of rotation at point A.

**[2 marks]**




Use tracing paper to rotate the triangle 1/4, 1/2 and 3/4 of a turn about point A

*Do not write outside the box*

**12** 10% of 2100 is 210

Work out 43% of 2100

**[3 marks]**

1% of 2100 is found by dividing it by 100.
Multiplying this by 43 works out 43%

Answer _____

**Turn over for the next question**

5

*Do not write outside the box*

**13** Katy records the number of cars using a drive-through each hour for 24 hours.
Here are the results.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 20 | 37 | 53 | 42 | 41 | 24 | 18 | 39 | 35 | 40 | 47 |
| 38 | 17 | 23 | 18 | 13 | 35 | 10 | 7 | 6 | 18 | 31 | 57 |

Katy makes this tally and frequency chart to put the data into groups.

| Number of cars | Tally | Frequency |
|---|---|---|
| 0 to 10 | | |
| 10 to 20 | | |
| 20 to 30 | | |
| 30 to 40 | | |
| 40 to 50 | | |

Make **two** criticisms of Katy's tally and frequency chart.
You do **not** need to complete the chart.

**[2 marks]**

Criticism 1 Which category would 10 go in?

Criticism 2 Which category would 53 go in?

*Do not write outside the box*

**14** Counters in a bag are red, white or blue.

A counter is picked at random.

Complete the table.

**[2 marks]**

| | **Red** | **White** | **Blue** |
|---|---|---|---|
| **Probability** | 0.15 | 0.4 | |

It is certain to get red, white or blue so therefore the probabilities have to add up to 1

**Turn over for the next question**

4

*Do not write outside the box*

**15** Here is a calculation.

$$31 \times 84 = 2604$$

You can use the calculation to help answer the following questions.

**15 (a)** Work out $2604 \div 84$

**[1 mark]**

Answer _____

Divide both sides of the equation by 84 to get 2604/84 on the right

**15 (b)** Work out $3.1 \times 8.4$

**[1 mark]**

Answer _____

31 and 84 are both divided by 10 to give 3.1 and 8.4

**15 (c)** Work out $31 \times 85$

**[2 marks]**

There is one more lot of 31

Answer _____

Do not write outside the box

**16** A password has 30 characters.

It is made up of 5 numbers, 15 letters and some symbols.

Work out the ratio numbers : letters : symbols

Give your answer in its simplest form.

**[2 marks]**

Subtracting the numbers and letters from the characters leaves the number of symbols. Express the numbers, letters and symbols as a ratio then simplify by dividing all sides by the same amount to get smaller whole number parts

Answer _____ : _____ : _____

**17** Work out $\frac{5}{6} + \frac{7}{12}$

Give your answer as a mixed number.

**[3 marks]**

Find a common multiple of 6 and 12. Convert one or both fractions so that they both have the same denominator, which is the common multiple, by multiplying both the numerators and denominators of each fraction by the same amount. Then the numerators can be added and the denominator stays the same. To convert the improper fraction into a mixed number, see how many times the denominator goes into the numerator. This is the whole number and the remainder is left in the fraction

Answer _____

9

*Do not write outside the box*

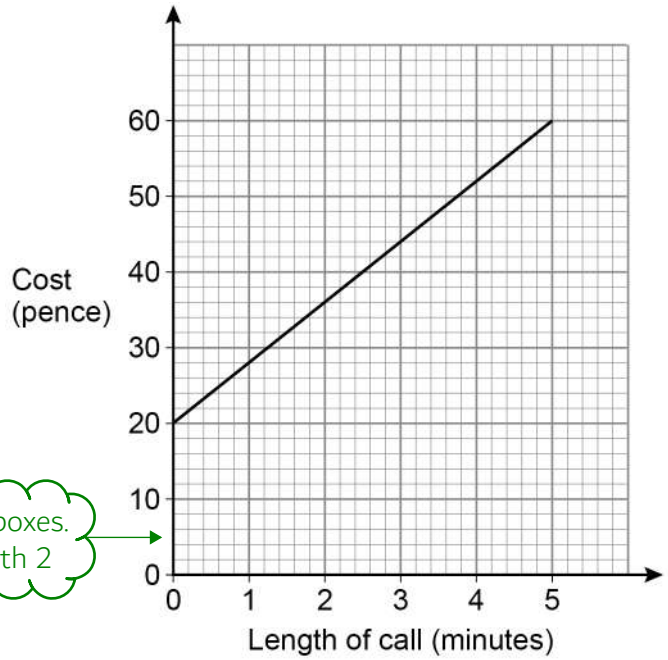
**18** The cost of making a phone call is

a fixed charge

and

a charge per minute.

The costs of phone calls up to 5 minutes are represented by the graph.




The scale goes up 10 over 5 boxes.
10/5 = 2 so each box is worth 2

**18 (a)** Write down the fixed charge.

**[1 mark]**

Answer _____ pence

There is no charge added for the minutes used when the length of call was 0 minutes

*Do not write outside the box*

**18 (b)** Work out the charge per minute.

**[2 marks]**

Work out the cost of a 1 minute call using the graph. Then work out the difference between this and the fixed price to work out the charge per minute

Answer _____ pence

**18 (c)** Work out the cost of a phone call lasting 7 minutes.

**[2 marks]**

The fixed charge add 7 lots of the charge per minute

Answer _____ pence

**Turn over for the next question**

5

*Do not write outside the box*

**19** A company sells bags of toffees and bags of mints.

Here are the numbers of sweets in 11 bags of toffees.

55 50 49 51 55 47 54 50 49 55 57

Here are the numbers of sweets in 10 bags of mints.

46 47 47 48 48 50 53 54 54 54

The company claims that the average number of sweets per bag is at least 50

Using medians, is the company's claim correct for each type of sweet?

You **must** work out the median for toffees and the median for mints.

**[4 marks]**

Toffees _____

_____

_____

Tick a box for toffees.

☐ Yes ☐ No

Mints _____

_____

_____

Tick a box for mints.

☐ Yes ☐ No

Using the formula (n + 1)/2, where n is the number of pieces of data, tells us which value is the median. Cross out the numbers starting with the smallest until this value is reached. If the median value is the 3.5th, for example, the median is halfway between the 3rd and 4th. If the median is at least 50, tick yes

Do not write outside the box

**20** Freddie tries to work out $\dfrac{29.15 + 83.47}{9.82}$

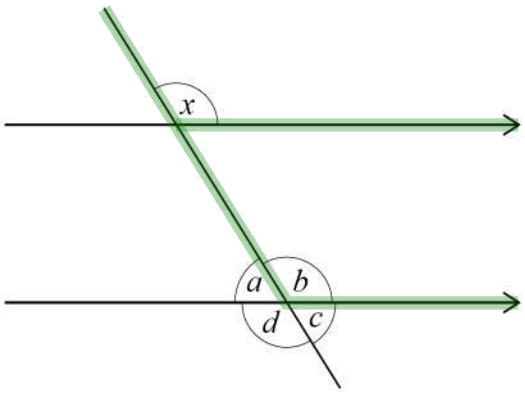
His answer is 37.65

By rounding each number to the nearest 10, show that his answer is incorrect.

**[3 marks]**

To round to the nearest 10, look at the number of units. If this is a 0, 1, 2, 3 or 4, round down, which means that the number of tens stays the same and the rest of the number after the tens becomes 0. If the number of units is a 5, 6, 7, 8 or 9, round up, which means that the number of tens increases by 1 and the rest of the number after the tens becomes 0. For example, 62 rounds to 60 and 96.2 rounds to 100. The value we work out should not be close to 37.65

**21** A straight line passes through two parallel lines.




Not drawn accurately

The insides of the F are corresponding

Circle the angle that is **corresponding** to angle $x$.

**[1 mark]**

$a$ $b$ $c$ $d$

8

*Do not write outside the box*

**22 (a)** Lucy wants to simplify $6a - (7b - 2a)$

She writes $4a - 7b$

Is she correct?

Tick a box.

☐ Yes ☐ No

Give a reason for your answer.

**[1 mark]**

Everything in the bracket is subtracted.
-2a is being subtracted as well as the 7b

**22 (b)** Lucy also wants to simplify $3p^2 \times 5p^7$

She says,

"Add 3 and 5, then add 2 and 7"

Her answer is $8p^9$

Tick a box for each part of her method.

**[1 mark]**

| | **Correct** | **Not correct** |
|---|---|---|
| Add 3 and 5 | ☐ | ☐ |
| Add 2 and 7 | ☐ | ☐ |

It simplifies to $15p^9$

Do not write outside the box

**22 (c)** Lucy thinks of a number.

$10 \times$ the number $= 10 \div$ the number

Give a possible value of the number.

**[1 mark]**

Dividing and multiplying by this number has no effect on the 10

Answer _____

**23** Lily's age is 2 years and 4 months.

Hugo's age is 1 year and 8 months.

Write Lily's age in months as a fraction of Hugo's age in months.

Give your fraction in its simplest form.

**[2 marks]**

Convert both Lily's and Hugo's age into months. There are 12 months in a year. Write Lily's ages in months over Hugo's age in months. To simplify the fraction, divide both the numerator and denominator by the same amount to get smaller whole numbers

Answer _____

5

*Do not write outside the box*

**24** Working alone, it takes Kevin 4 hours to paint an area of 12 $m^2$

Kevin and Steve are going to paint an area of 24 $m^2$

Kevin says,

"Working together at the same rate it will take us 8 hours, because 24 is 2 × 12"

Is he correct?

Tick a box.

☐ Yes ☐ No

Give a reason for your answer.

**[1 mark]**

The area is twice as much but there are also twice as many people

Do not write outside the box

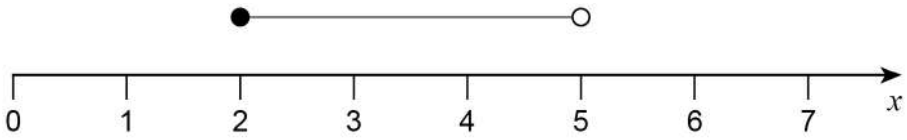
**25 (a)** Solve $5x + 6 > 3x + 15$

**[3 marks]**

Get all the x terms on the same side, the one with the most x, then get the x terms on their own then get x on its own. The inequality solves in a similar way to an equation. Do the opposite operation to both sides to eliminate

Answer $x >$

**25 (b)** Write down the inequality represented by the number line.




**[2 marks]**

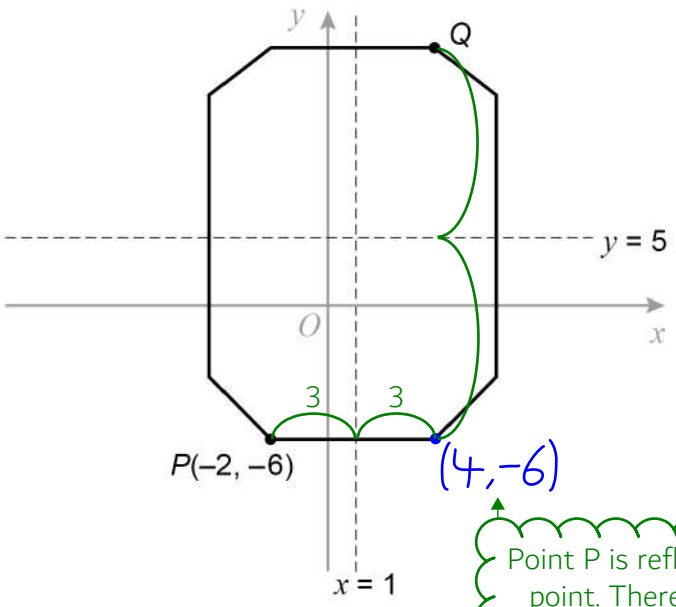
Answer $\leqslant x <$

6

**Turn over ►**

*Do not write outside the box*

**26** The diagram shows an octagon.




Not drawn accurately

Point P is reflected on the line x = 1 to get this point. There are 3 jumps to the line in the x direction, as the difference between 1 and -2 is 3, so another 3 jumps are done on the other side. 1 + 3 = 4. The y coordinate stays the same

$x = 1$ and $y = 5$ are lines of symmetry.

Work out the coordinates of point $Q$.

**[2 marks]**

(4 , -6) is reflected on the line y = 5 to get point Q

Answer ( _____ , _____ )

*Do not write outside the box*

**27 (a)** Work out $2000 \times 70\,000$

Give your answer in standard form.

**[2 marks]**

2 x 7 = 14. 2000 is 2 multiplied by 10 3 times and 70000 is 7 multiplied by 10 4 times so adjust the answer of 14 by multiplying by 10 an appropriate number of times. Standard form is in the form a x $10^n$ where $1 \leq a < 10$ and n is a whole number

Answer _____

**27 (b)** Work out $\dfrac{1.8 \times 10^2}{3 \times 10^{-1}}$

Give your answer as an ordinary number.

**[2 marks]**

$(1.8/3) \times (10^2/10^{-1})$. $a^x/a^y = a^{x-y}$

Answer _____

6

*Do not write outside the box*

**28** *A*, *B*, *C* and *D* are junctions on a motorway.

Not drawn accurately


distance *CD* = 3 × distance *AB*

distance *BC* = 25 miles

Salma drives from *A* to *C*.

She drives for 30 minutes at an average speed of 62 miles per hour.

Work out the distance *AD*.

**[4 marks]**

s d t

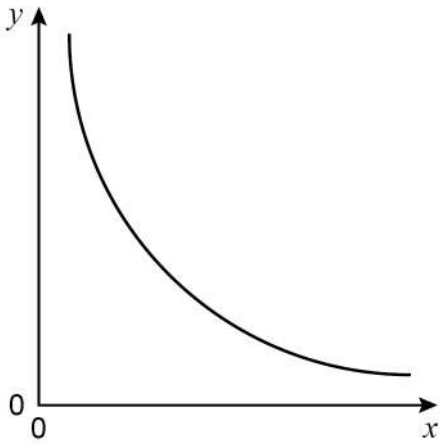
This is a speed, distance, time problem so writing out the formula triangle

First work out AC. The time needs to be in hours to do this.
AC - BC = AB
AB x 3 = CD
AC + CD = AD

Answer _____ miles

Do not write outside the box

**29** Here is a sketch of a graph.




Circle the equation of the graph.

$k$ is a constant.

**[1 mark]**

$y = kx$ $\quad$ $y = k + x$ $\quad$ $y = k - x$ $\quad$ $y = \frac{k}{x}$

y increases as x increases for both of these so it can't be these two

**30** Write 200 as a product of prime factors.

Give your answer in index form.

**[3 marks]**

200

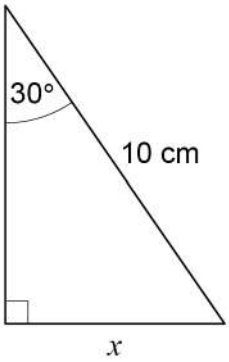
Do a factor tree for 200 and circle the primes. Then write all the circled primes multiplied together in the form $a^x \times b^y$ where a and b are prime numbers and x and y are positive whole numbers

Answer _____

8

*Do not write outside the box*

**31** Here is a right-angled triangle.




Not drawn accurately

Use trigonometry to work out the value of $x$.

**[3 marks]**

$S^{O}H\,C^{A}H\,T^{O}A$ ← Right angled trigonometry can be used so writing SOH CAH TOA as formula triangles

Tick what we have and what we are trying to find. If there are two ticks on a formula triangle that one can be used. To use the formula triangle cover over what we are trying to find and the rest will tell us what to do. S: sin of the angle. C: cos of the angle. T: tan of the angle. O: opposite. H: hypotenuse. A: adjacent

Answer _____ cm

List the angles we need to remember which are 0, 30, 45, 60, 90. For the sin values list 0, 1, 2, 3, 4 under these, square root them then put them over 2. For the cos values list 4, 3, 2, 1, 0 under these, square root them then put them over 2. For the tan values, divide the sin value by the cos value

**32** Factorise $x^2 + 7x + 10$

**[2 marks]**

It is in the form $x^2 + bx + c$. Find two numbers which add to b and multiply to c and put these in the brackets with x

Answer (x )(x )

**END OF QUESTIONS**

5