AQA

.CG Maths.
Hints

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

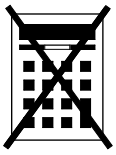
Foundation Tier Paper 1 Non-Calculator

Thursday 24 May 2018 Morning 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.
- 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 graph paper, tracing paper and more answer 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	
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

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Answer **all** questions in the spaces provided

Do not write outside the box

1 Work out $\frac{1}{2} \times 5$

Circle your answer.

[1 mark]

$\frac{5}{10}$ $2\frac{1}{2}$ $\frac{1}{10}$ $2\frac{1}{5}$

Multiply the numerator of 1/2 by 5 then convert into a mixed fraction by dividing the numerator by the denominator to find the whole number and leaving the remainder over the denominator

2 Circle the number that is 5 **less** than –2

[1 mark]

–10 –7 –3 3

Count back 5 from -2. It gets more negative

3 Simplify $3 \times a \times 3 \times a$

Circle your answer.

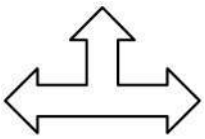
[1 mark]

$9a$ $6a^2$ $9a^2$ $6a$

The multiplication can be done in any order. 3 x 3 x a x a

Do not write outside the box

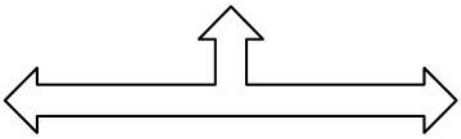
4 Which shape is **similar** to shape X?



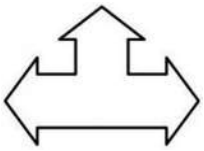
X

Circle the correct letter.

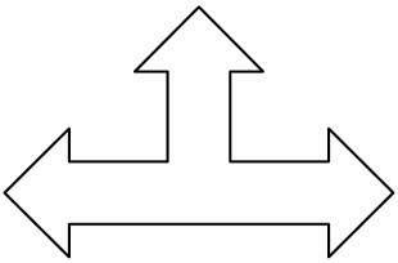
[1 mark]



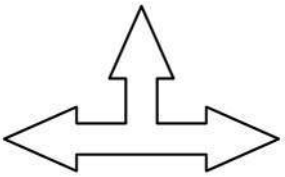
A



B



C



D

Similar means that all of the angles in the shapes are the same and that the sides are in the same proportions. In other words, they look the same but one is scaled up from the other

4

Do not write outside the box

5 Work out 20% of 14 000

[2 marks]

10% is 1/10, which can be found by dividing 14000 by 10. Multiplying 10% by 2 gives 20%

Answer _____

6 (a) Write 0.85 as a fraction in its simplest form.

[2 marks]

85 divided by 100 is the same as 0.85. Express this as a fraction then simplify it by dividing both the numerator and denominator by the same amount to get smaller whole numbers

Answer _____

6 (b) Write $\frac{5}{8}$ as a decimal.

[1 mark]

8⟌5

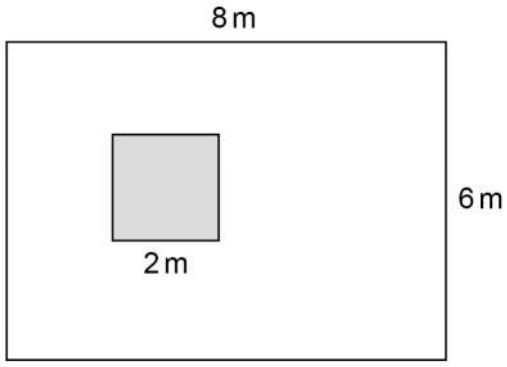
Dividing the numerator by the denominator converts it into a decimal

Answer _____

Do not write outside the box

7 A rectangular carpet measures 8 m by 6 m

Part of the carpet is covered by a square rug of length 2 m



Not drawn accurately

Show that $\frac{1}{12}$ of the carpet is covered by the rug.

[2 marks]

Area of rectangle = length x width. Area of a square = length^2. Express the area of the rug as a fraction of the area of the carpet. Simplify the fraction by dividing both the numerator and denominator by the same amount to get 1/12

7

Do not write outside the box

8 Sam, Carl and Erik share 40 sweets.

Erik gets the largest share.

What is the **smallest** possible number of sweets that Erik could get?

[2 marks]

Dividing the 40 sweets by the 3 people works out how many each would get if they were evenly shared. There should be a remainder. Work out who should get the remaining sweets in order that Erik gets the largest share

Answer _____

9 The time in Rio is three hours behind London.

The time in New York is five hours behind London.

What is the time in New York when it is 1.00 am in Rio?

[2 marks]

Work out what time it is in London by considering that it is 3 hours ahead of Rio. New York is 5 hours behind this

Answer _____

Do not write outside the box

10 Here is a list of numbers.

5 6 1 3 5 5 8 4 2 2

10 (a) Work out the median.

[2 marks]

Write the numbers in order then cross out from both ends until there are two numbers left in the middle. The mean of both of these numbers, which can be found by adding them together then dividing by 2, is the median

Answer _____

10 (b) Work out the mean.

[2 marks]

Add all the numbers together then divide by how many there are

Answer _____

Turn over for the next question

8

Do not write outside the box

11 300 passengers go on a coach trip.

Each coach takes 50 passengers.

Each passenger pays £25

The table shows the costs for the coach company.

	Cost for each coach
Pay for driver	£90
Fuel	70p per mile

Each coach travels 200 miles.

Work out the **total** profit the company makes from this trip.

[6 marks]

Profit = income - outgoings. The income can be calculated by considering that there are 300 passengers who each pay £25. The outgoings are the costs of the drivers and the fuel. Work out how many coaches are needed by considering that there are 300 passengers and each coach takes 50 passengers. Multiply the number of coaches by the cost of each driver to work out the cost of the drivers. Multiply the number of miles each coach travels by the cost per mile in pounds (which can be found by using the fact there is 100p in £1) then multiply this by the number of coaches to work out the cost of the fuel

Answer £ _____

Do not write outside the box

12 (a) Work out 16.4 – 3.92 + 7.8

[2 marks]

16.40
− 3.92

Subtraction and addition can be done in any order so subtracting the 3.92 from the 16.4 first then adding 7.8 to the result

Answer _____

12 (b) Work out 2843.61 ÷ 7

[2 marks]

7 | 2 8 4 3 . 6 1

Answer _____

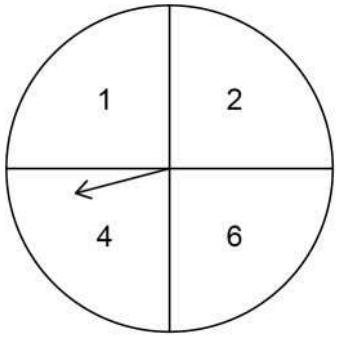
Turn over for the next question

10

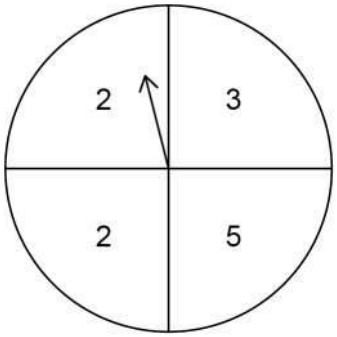
Do not write outside the box

13 In a game, two fair spinners are spun.

Spinner A



Spinner B



If the numbers the arrows land on are different, the score is the **higher** number.

If the numbers the arrows land on are the same, the score is 0

13 (a) Complete the table to show the possible scores.

[2 marks]

The score is 2 when Spinner A lands on 1 and Spinner B lands on 2 as 2 is the higher number

The score is 0 when Spinner A lands on 2 and Spinner B lands on 2 as they are both the same

Spinner A \ Spinner B	**2**	**2**	**3**	**5**
1	2			
2		0		
4				
6				

13 (b) Write down the probability that the score is an **odd** number.

[1 mark]

Express the number of scores which are odd as a fraction of the total number of possible scores

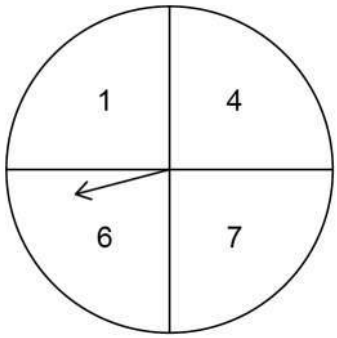
Answer _____

Do not write outside the box

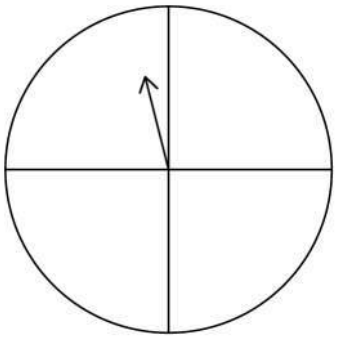
13 (c) The same game is played using spinners C and D.

The numbers on C are shown.

Spinner C



Spinner D



The table shows some of the possible scores.

The higher score must be 4

The score on both spinners must be the same

Spinner C \ Spinner D				
1	4			
4		0		
6				
7			0	8

Write the missing numbers on spinner D.

[2 marks]

5

Turn over ►

Do not write outside the box

14 2 people working at the same rate will take 6 hours to paint a room.

14 (a) Assuming that they **all** work at this rate,

how long will it take 3 people to paint the room?

[2 marks]

2 people work for 6 hours so 2 lots of 6 hours worth of work will be done. Dividing these hours worth of work by the 3 people works out what each will spend

Answer _____ hours

14 (b) In fact, the **third** person works at a faster rate.

How does this affect the time to paint the room?

[1 mark]

Time = distance/speed.
Going a faster speed means...

Do not write outside the box

15 $3a + b = 7$ and $6x + 8y = 40$

Show that $9a + 3b$ has a **greater** value than $3x + 4y$

[2 marks]

9a + 3b is 3 times greater than 3a + b. 3x + 4y is half of 6x + 8y

Turn over for the next question

5

Do not write outside the box

16 Circle the point that lies on the line $x - 3 = 0$

[1 mark]

(3, 0) (0, 3) (–3, 0) (0, –3)

Substitute each x coordinate into the equation to see if it works

17 a is a negative odd number.

Circle the words that describe a^2

[1 mark]

negative and odd negative and even

positive and odd positive and even

a^2 = a x a. Negative x negative = ... Odd x odd = ...

18 Circle the ratio which is the same as the scale 1 cm represents 1 km

[1 mark]

1 : 100 1 : 1000 1 : 10 000 1 : 100 000

1km is 1000m. There are 100cm in 1m. Convert the 1km into centimetres so that it is in the same unit. For example, if 1cm represented 50cm the scale would be 1:50

Do not write outside the box

19 Circle the percentage that is closest in value to $\frac{1}{3}$

[1 mark]

30% 33% 33.3% 33.4%

3|100

Multiplying 1/3 by 100 converts it into a percentage. This becomes 100/3, which is...

20 Work out $\sqrt{121} - (13 - 5 \times 2)^2$

[3 marks]

The order of operations, BIDMAS, needs to be followed

Answer _____

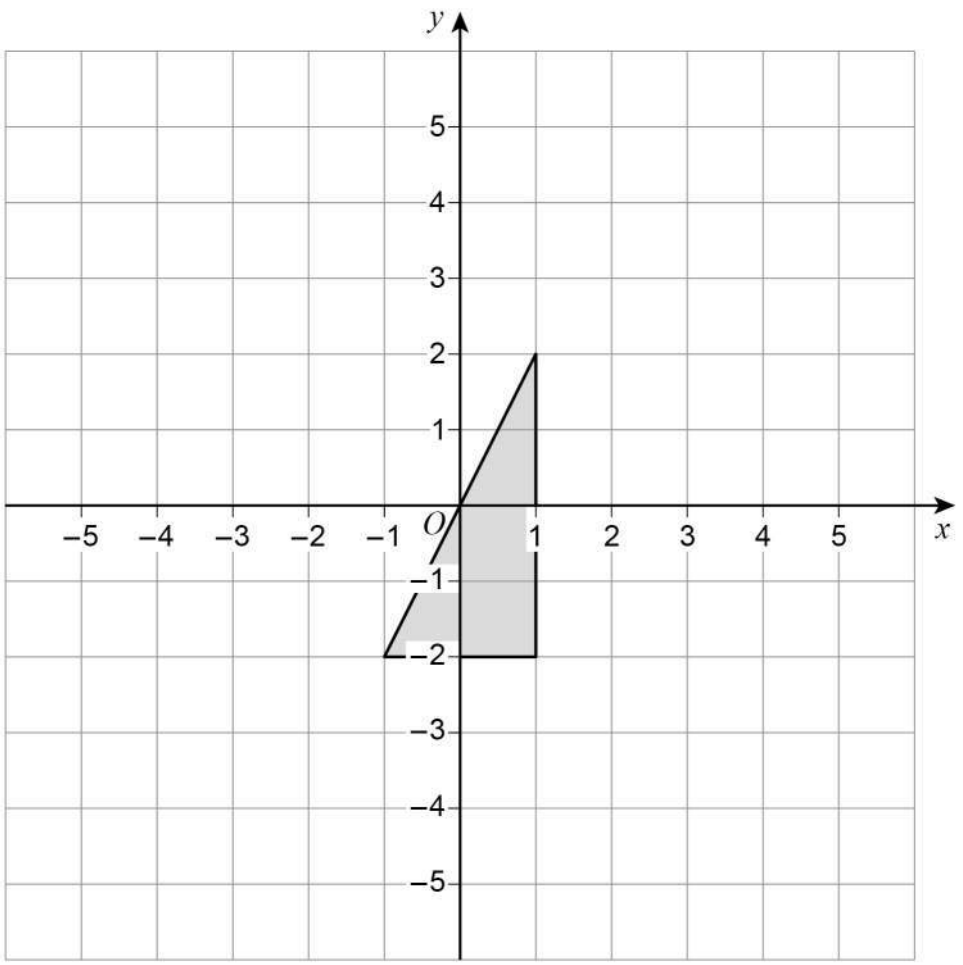
Turn over for the next question

7

Do not write outside the box

21 (a) Reflect the triangle in the line $x = 2$

[2 marks]

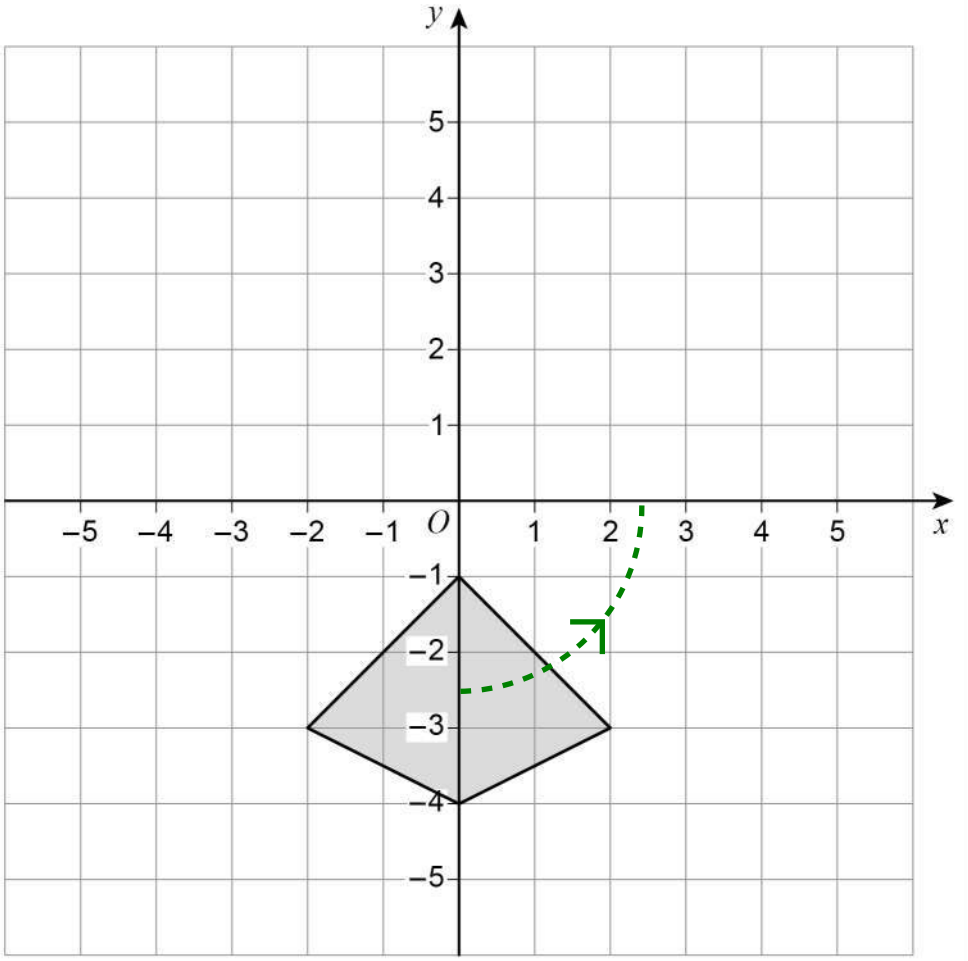


Draw the line of x = 2 by considering that the x coordinate always needs to be 2 regardless to what y is. Reflect each corner by counting the number of jumps to the line and doing the same number on the other side then join up the corners using a ruler

Do not write outside the box

21 (b) Rotate the kite 90° anticlockwise about (0, 0)

[2 marks]



Rotate by using tracing paper to draw around the original shape then put something sharp in the point (0 , 0) and rotate the paper 90 degrees anticlockwise

Turn over for the next question

4

Do not write outside the box

22 Anna plays a computer game.

Each game is a win or a loss.

She wins three quarters of her first 24 games.

She then wins her next 12 games.

For all 36 games, work out the ratio wins : losses

Give your answer in its simplest form.

[3 marks]

To work out a fraction of an amount, divide the amount by the denominator then multiply the result by the numerator. Work out 3/4 of 24. Then add the 12 wins after this to work out how many wins there were altogether. The rest of the 36 games must have been losses. Express the numbers of wins and losses as a ratio then simplify it by dividing both sides by the same amount until they cannot be divided any further to get whole numbers

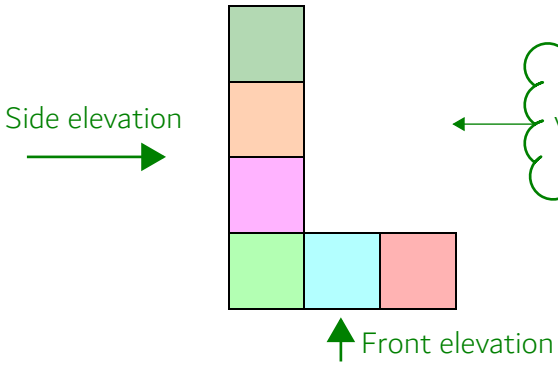
Answer _____ : _____

Do not write outside the box

23 A solid shape is made from centimetre cubes.

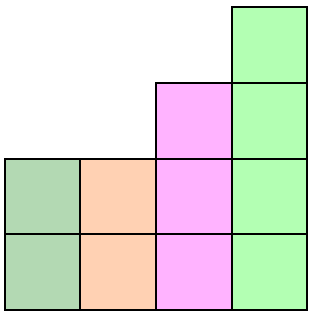
Here are the plan, side elevation and front elevation of the shape.

Plan

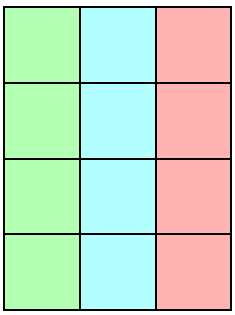


The colours on the plan correspond to the views on the side and front elevation. Work out how tall each of the columns are on the plan

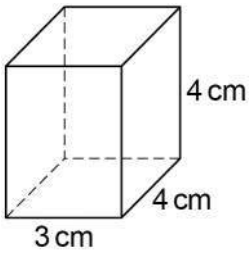
Side elevation



Front elevation



Centimetre cubes are added to make this cuboid.



How many cubes are added?

[3 marks]

Length x width x height works out how many centimetre cubes are in the cuboid. Subtracting the total number of centimetre cubes currently in the solid shape works out how many centimetre cubes need to be added

Answer _____

6

Do not write outside the box

24 Divide 405 in the ratio 4 : 11

[3 marks]

There is 405 in total. Work out how many parts there are in total.
Divide the 405 by this many parts to work out the value of 1 part.
Then multiply the value of 1 part by 4 to get the value of the 4 parts
and multiply the value of 1 part by 11 to get the value of the 11 parts

Answer _____ and _____

25 The height of Zak is 1.86 metres.

The height of Fred is 1.6 metres.

Write the height of Zak as a fraction of the height of Fred.

Give your answer in its simplest form.

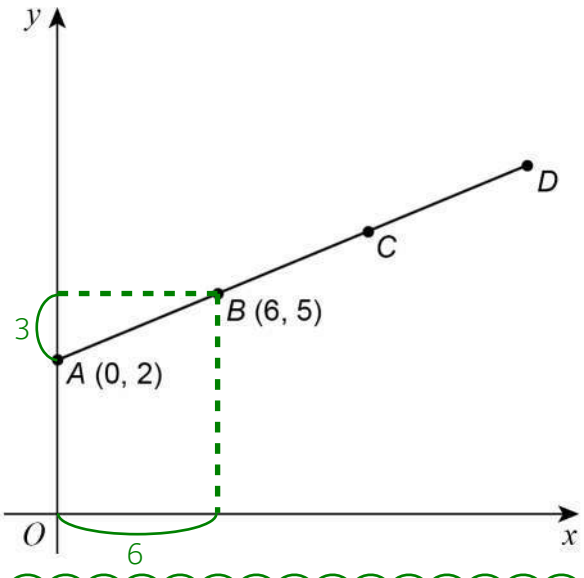
[3 marks]

Putting the height of Zak over the height of Fred expresses the fraction. Multiply the numerator and denominator by the same amount to eliminate the decimals and make it simpler. Then keep dividing the numerator and denominator by the same amount to get smaller whole numbers until it cannot be done any more

Answer _____

Do not write outside the box

26 *A* (0, 2) and *B* (6, 5) are points on the straight line *ABCD*.



Not drawn accurately

AB = *BC* = *CD*

Therefore all of the points are equally spaced out

Work out the coordinates of *D*.

[3 marks]

As all the points are equally spaced out and are on a straight line, the change in x and y between each point must be the same

Answer (_____ , _____)

Turn over for the next question

9

Do not write outside the box

27 A coin is thrown 50 times.

It lands on heads 31 times.

27 (a) Write down the relative frequency it lands on heads.

[1 mark]

Answer _____

Express the fraction of the throws which were heads

27 (b) Raj says,

"The coin is biased towards heads."

Use the data to give a reason why he might be correct.

[1 mark]

Biased towards heads means that it was more likely to be heads than tails

28 Solve $5(x + 3) < 60$

[2 marks]

Follow BIDMAS backwards and do the opposite operations to both sides to eliminate everything apart from x on the left

Answer _____

Do not write outside the box

29 The range of a set of numbers is $15\frac{1}{4}$

The smallest number is $-2\frac{7}{8}$

Work out the largest number.

[3 marks]

Convert both mixed fractions into improper fractions by multiplying the whole numbers by the denominators then adding the results to the numerators. The range is the distance between the largest and smallest so adding the range to the smallest number works out the largest number. To add or subtract fractions the denominators need to be the same

Answer _____

30 y is inversely proportional to x.

Complete the table.

[2 marks]

x	12	6	
y		4	8

Doubling x halves y. Halving x doubles y. Doubling y halves x. Halving y doubles x

Turn over for the next question

9

Do not write outside the box

31 A large rectangle is made by joining three identical small rectangles as shown.

Not drawn accurately

The perimeter of one small rectangle is 15 cm

Work out the perimeter of the large rectangle.

[4 marks]

Let x be the shorter edge of each small rectangle. The longer edge on each small rectangle can be expressed as a multiple of x. Express the perimeter of a small rectangle in terms of x and set this equal to the perimeter. This creates an equation which can be solved to work out x. Then work out how many lots of x are on the perimeter of the large rectangle and work out what the value of this is

Answer _____ cm

Do not write outside the box

32 Put these numbers in order from smallest to largest.

8×10^{-4} 4×10^{-2} 6×10^{-4} 0.07

[2 marks]

x 10^{-n} means to divide by 10 n times. Converting the standard form into ordinary form allows the numbers to be easily compared

Smallest _____

_____

_____

Largest _____

END OF QUESTIONS

6