

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 25 May 2017

Morning

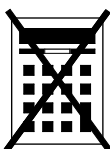
Time allowed: 1 hour 30 minutes

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.
- 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 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	
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

Answer **all** questions in the spaces provided

- 1 How many minutes are there in $3\frac{1}{2}$ hours?

Circle your answer.

[1 mark]

180.5

210

330

350

There are 60 minutes in an hour.

$$3 \times 60 = ?$$

$$1/2 \times 60 = ?$$

- 2 Work out $\frac{1}{4} + 0.5$

Circle your answer.

[1 mark]

0.30

0.6

0.75

0.9

Convert the fraction into a decimal
as the answer needs to be a decimal.

$$1/4 = 0.25$$

- 3 Which of these shapes has the most sides?

Circle your answer.

[1 mark]

Hexagon

Octagon

~~Rhombus~~

~~Trapezium~~

4 sides

4 sides



4 Solve $x - 3 = 0$

Circle your answer.

[1 mark]

$x = -3$

$x = 0$

$x = \frac{1}{3}$

$x = 3$

Rearranging the equation by
adding 3 to both sides gives $x = ?$

5 Work out 58×73

[3 marks]

$$\begin{array}{r} 73 \\ \times 58 \\ \hline 584 \\ \end{array}$$

Use long multiplication.
73 x 8 has been done.
73 x 50 needs to be done.
Then add together the results.

Answer _____

Check: $60 \times 70 = 4200$ so the
answer should be close to this.

Turn over ►



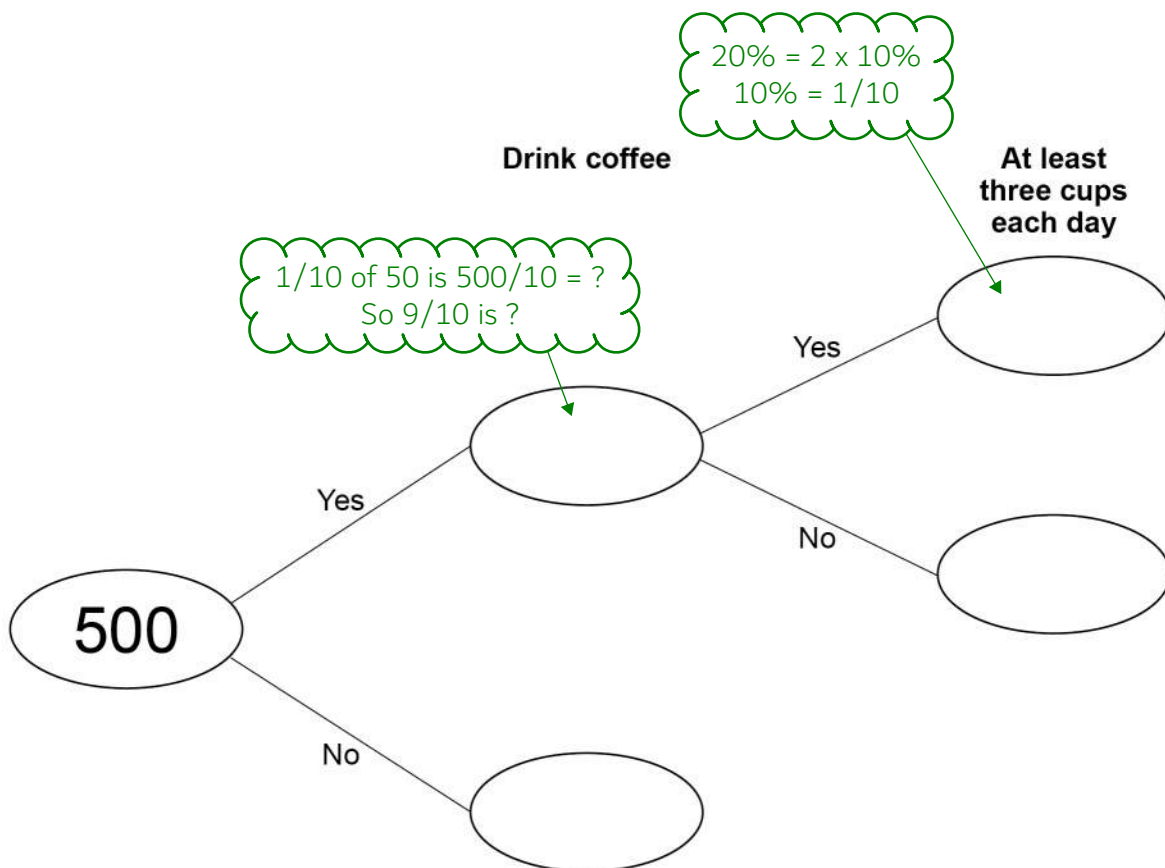
6 500 people are asked if they drink coffee.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes drink at least three cups each day.

6 (a) Complete the frequency tree.

[4 marks]



- 6 (b)** What fraction of the 500 people drink at least three cups of coffee each day?
Give your answer in its simplest form.

90 out of 500

[2 marks]

Answer _____

- 7** By rounding each number to the nearest 10,

estimate the answer to $\frac{61 \times 47}{102}$

You **must** show your working.

Look at the units to determine
if the tens round up or down.
0, 1, 2, 3 and 4 rounds down.
5, 6, 7, 8 and 9 rounds up.

[2 marks]

Answer _____

Turn over for the next question



8 Nadia has £5 to buy pencils and rulers.

Prices	
Pencils	8p each
Rulers	30p each

She says,

“I will buy 15 pencils.

Then I will buy as many rulers as possible.

With my change I will buy more pencils.”

How many pencils and how many rulers does she buy?

[6 marks]

1. Work out the cost of 15 pencils.
2. Work out how much money is left over to spend on rulers.
3. Work out how many lots of 30p go into the amount left over.
4. Work out the remainder from the rulers.
5. Work out how many lots of 8p go into the remainder.
6. Add up the two quantities of pencils.

Answer _____ pencils, _____ rulers



9 Work out $25.68 \div 12$

[2 marks]

$$12 \overline{)25.68}$$

Answer _____

10 Work out $\frac{3}{8} \times 11$

Give your answer as a mixed number.

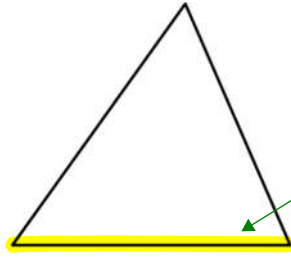
[2 marks]

Multiply 11 by the numerator, the denominator stays the same. Divide the new numerator by 8 to work out the whole number part of the mixed fraction and leave the remainder in the fraction.

Answer _____



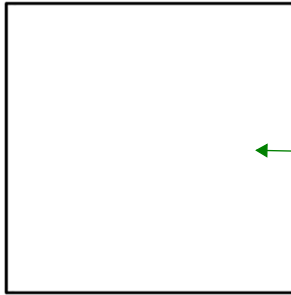
11 A triangle has perimeter 32 cm



This side is a side of the square. This means both of the other sides can be found by $32 - \text{length of square}$

Not drawn accurately

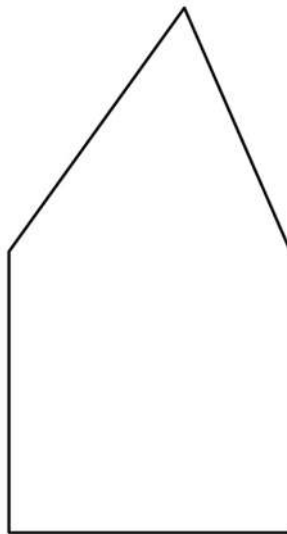
A square has perimeter 40 cm



All sides of a square are equal.

Two sides of the shapes are put together to make a pentagon.

Not drawn accurately



Work out the perimeter of the pentagon.

[4 marks]

Adding up all the sides
works out the perimeter.

Answer _____ cm

Turn over for the next question

Turn over ►



12 A football team has P points.

$$P = 3W + D$$

W is the number of wins

D is the number of draws

12 (a) A team has 6 wins and 2 draws.

How many points does the team have?

[1 mark]

$$W = 6, D = 2$$

Substitute these values into
the formula to find P .

Answer _____

12 (b) After 33 games a different team has 53 points.
11 games were draws.

How many games has this team **lost**?

The formula essentially means
there are 3 points for a win and
1 point for a draw, so there
must be 0 points for a loss.

[4 marks]

Work out how many points must have been
from wins. Use this to calculate how many wins
there were. Subtracting the number of wins
and draws will leave the number of games lost.

Answer _____



13

$$2 + 0 + 1 + 7 = 10$$

Make the following calculations correct.

Use only the symbols $+$, $-$, \times , \div and $()$

[3 marks]

$$2 \quad 0 \quad 1 \quad - \quad 7 \quad = \quad -4$$

$$2 \quad \times \quad 0 \quad 1 \quad 7 \quad = \quad 0$$

$$(2 \quad 0) \quad (1 \quad 7) \quad = \quad 2^4 \quad (2 \times 2 \times 2 \times 2 = ?)$$

Turn over for the next question

Turn over ►



- 14** A number is picked at random from the first four **prime** numbers.
A number is picked at random from the first four **square** numbers.
The two numbers are added to get a score.

- 14 (a)** Complete the table.

[4 marks]

Square numbers

+	1	4	9	4^2
2				
3			12	
7				

Prime numbers

Primes are only divisible by themselves and 1. It is between 3 and 7.

$9 + 3 = 12$

- 14 (b)** What is the probability that the score is a **prime** number?

[1 mark]

Answer _____

$$\frac{\text{Number of prime outcomes}}{\text{Total possible outcomes}}$$



15

In a school show,

girls : boys = 1 : 1

girls who sing : girls who do not sing = 1 : 2

8 girls **sing** in the show.

How many students are in the show altogether?

[3 marks]

Total number of students = girls + boys
Boys = girls using the first ratio.
Twice as many girls don't sing than do.

Answer _____

Turn over for the next question**Turn over ►**

16 P and Q are points on the line $3x + 2y = 6$

16 (a) Complete the coordinates of P and Q .

[2 marks]

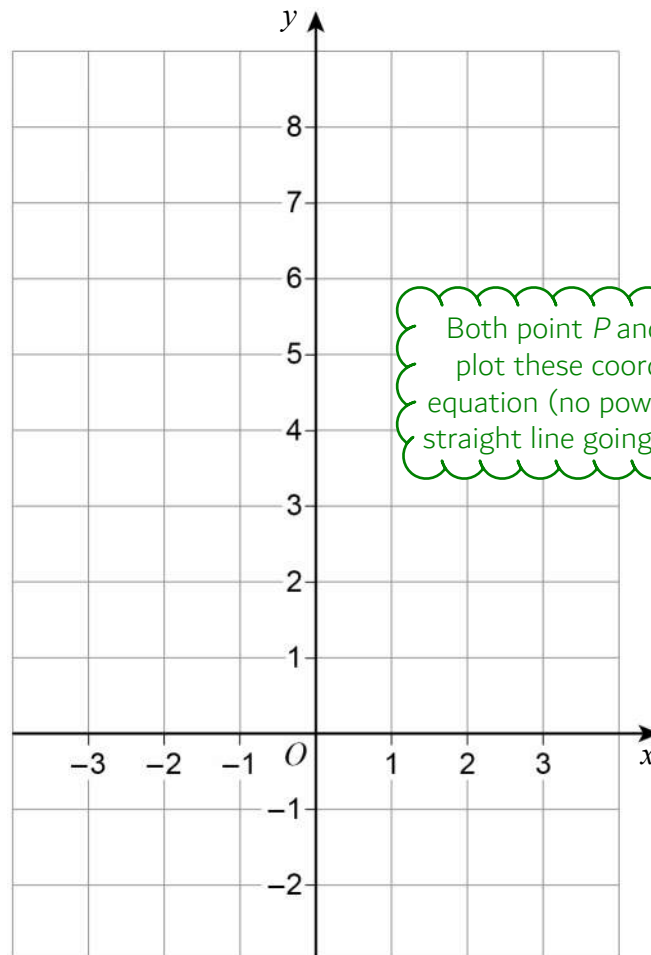
$$2y = 6$$

$x = 0$ at point P . $3 \times 0 = 0$ so this leaves $2y = 6$
 $y = 0$ at point Q . $2 \times 0 = 0$ so this leaves...

$P (0, \underline{\quad})$ $Q (\underline{\quad}, 0)$

16 (b) Draw the line $3x + 2y = 6$ for values of x from -3 to 3

[2 marks]



17 Circle the expression which does **not** simplify to y^3

[1 mark]

$$y \times y \times y$$

$$y^4 \div y$$

$$y^2 \times y$$

$$y^6 \div y^2$$

Try substituting y for 2. Each of the expressions should give 2^3 ($2 \times 2 \times 2$)

18 Write the number six million five thousand two hundred in **standard form**.

[2 marks]

Start by writing the number in ordinary form if this helps. Starting with the 200 then the 5000 makes this easier. Then convert into standard form.

A number between 1 and 10 (not including 10) multiplied by a power of 10.

Answer _____

Turn over for the next question



19 (a) Use $8 \text{ km/h} = 5 \text{ mph}$ to convert 96 km/h to mph

[2 marks]

Work out how many lots of 8 km/h there are. There are this many lots of 5 mph as they are equal.

Answer _____ mph

19 (b) $x \text{ km/h} = y \text{ mph}$

Use $8 \text{ km/h} = 5 \text{ mph}$ to write a formula for y in terms of x .

[2 marks]

Describe the process we made in the previous part algebraically. Or make an equation where both sides are equal and rearrange to find y .

Answer $y =$

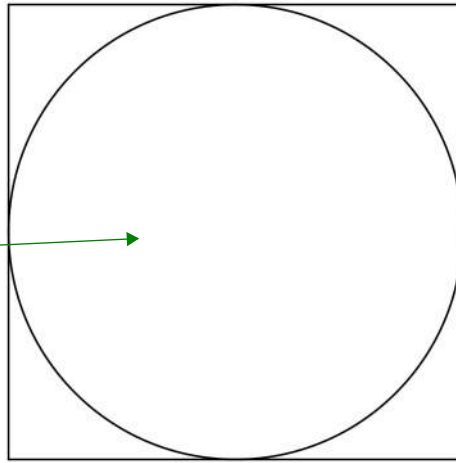


20

Here is a circle touching a square.

Not drawn
accurately

The area of the circle
must be less than 64

The area of the square is 64 cm^2

Work out the area of the circle.

Give your answer **in terms of π** .

Leave π in the answer,
don't convert it to a
decimal

[3 marks]
 πr^2

Start with the formula for
the area of a circle. r is
the radius. We need to
find another length (to do
with the square) to find it.

Answer _____ cm^2

Turn over for the next question

Turn over ►



21

Billy wants to buy these tickets for a show.

4 adult tickets at £15 each

2 child tickets at £10 each

A 10% booking fee is added to the ticket price.

3% is then added for paying by credit card.

Work out the **total** charge for these tickets when paying by credit card.**[5 marks]**

$$4 \times 15 \quad 2 \times 10$$

$$10\% = \frac{1}{10} \rightarrow \div 10$$

$$3\% = 3 \times 1\% = 3 \times \frac{1}{100} \rightarrow \div 100 \text{ then } \times 3$$

Answer £ _____



22 (a) Density = $\frac{\text{mass}}{\text{volume}}$

Consider the changes one at a time. Increasing the mass will increase the density. What would increasing the volume do?

The mass of solid A is 6 times the mass of solid B.

The volume of solid A is 3 times the volume of solid B.

Complete the sentence.

[1 mark]

The density of solid A is _____ times the density of solid B.

Consider the changes one at a time.

22 (b) Average speed = $\frac{\text{distance}}{\text{time}}$

If the distance is halved and the time is doubled, what happens to the average speed?

Circle your answer.

[1 mark]

$\times 2$

$\times 4$

no change

$\div 2$

$\div 4$

Turn over for the next question



23 A regular polygon has an exterior angle of 20°

Work out the number of sides of the polygon.

[2 marks]

Exterior angle = $360/\text{number of sides}$
Number of sides = $360/\text{exterior angle}$

Answer _____

24 $\frac{1}{2} : \frac{2}{3} = x : 1$

Circle the value of x .

The ratio has been simplified so that the right hand side is 1. $2/3$ needs to be divided by $2/3$ to get 1. Dividing by $2/3$ needs to happen on both sides of the ratio.

[1 mark]

$$\frac{1}{3}$$

$$\frac{3}{5}$$

$$\frac{3}{4}$$

$$\frac{4}{3}$$



25 The table shows information about the times for 10 people to complete a task.

Time, t (minutes)	Frequency
$0 < t \leq 20$	1
$20 < t \leq 40$	6
$40 < t \leq 60$	3

Between 0 and 20 minutes

The number of times a result occurs

3 people completed the task between 40 and 60 minutes

These statements are about the mean and range of the actual times.

Tick the correct box for each statement.

[4 marks]

A type of average which finds the 'central' value.
Add up all the results then divide by the number of results

True

False

The mean could be less than 20 minutes

Assume all the values are as low as possible in their range

The mean could be more than 40 minutes

Assume all the values are as high as possible in their range

The mean could be less than 40 minutes

What is the highest possible range?

The range could be more than 40 minutes

The range could be less than 40 minutes

The range could be more than 60 minutes

7

Turn over ►



26

Write 36 as a product of **prime factors**.Give your answer in **index form**.**[3 marks]**e.g. $2^3 \times 3^2 \times 5 \times 7^2$ 

Factor tree

Factor of 36: a whole number which can be multiplied by another whole number to give the number 36.

$4 \times 9 = 36$, therefore 4 and 9 are factors.

Prime number: a whole number which can only be divided by itself and 1 to get another whole number.

7 can only be divided by 7 and 1, therefore 7 is prime.

Answer _____

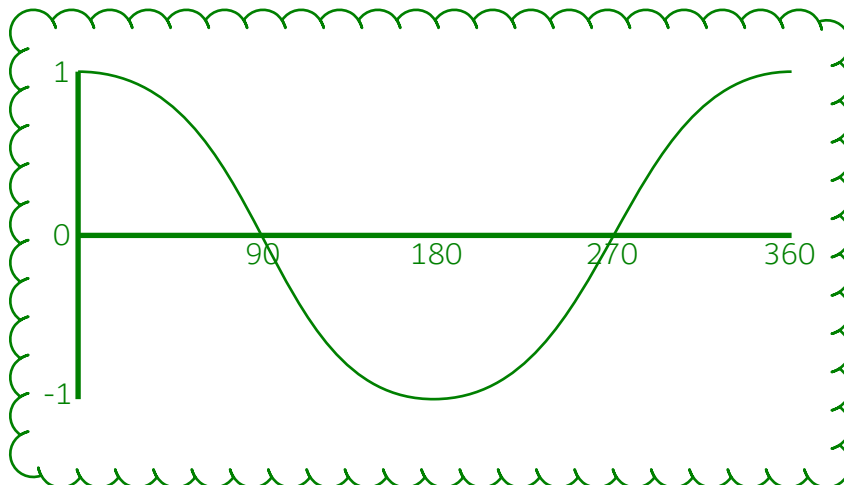
27

Circle the value of $\cos 90^\circ$ **[1 mark]**

0

 $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$

1



28 Solve the simultaneous equations.

$$2x + y = 18$$

$$x - y = 6$$

[3 marks]

The magnitude of the y terms are the same in both equations so start by adding both of the equations together to eliminate the y terms and leave an equation in terms of x which can be rearranged and solved.

Answer _____

END OF QUESTIONS

