GCSE MATHEMATICS

Foundation Tier     Unit 2  Number and Algebra

Friday 6 November 2015     Morning     Time allowed: 1 hour 15 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.

Information
• The marks for questions are shown in brackets.
• The maximum mark for this paper is 66.
• The quality of your written communication is specifically assessed in Questions 7, 10, 16 and 17. These questions are indicated with an asterisk (*).
• You may ask for more answer paper and graph paper. These must be tagged securely to this answer book.

Advice
• In all calculations, show clearly how you work out your answer.
1 (a) Write down the next odd number after 4529

Answer ...........................................................................

1 (b) Write down all the factors of 21

........................................................................................................
........................................................................................................

Answer ...........................................................................

1 (c) Show that 20 is a multiple of 5

........................................................................................................
........................................................................................................

2 (a) Write in words the number 2.46

........................................................................................................

2 (b) Write the number 2046 to the nearest 10

Answer ......................................................................................
2 (c) Write down the value of the digit 4 in the answer to $246 \times 10$  

............................................................................................................................................

............................................................................................................................................

Answer ..............................................................................

2 (d) Work out $2 + 4 \times 6$  

............................................................................................................................................

............................................................................................................................................

Answer ..............................................................................

2 (e) Use each of the numbers 2, 4 and 6 once only to write a calculation with an answer of 3  

.................................................................................................................. = 3
3 (a) Circle the decimal that is equivalent to \( \frac{3}{4} \) [1 mark]

- 0.34
- 0.45
- 0.60
- 0.75

3 (b) Circle the percentage that is equivalent to 0.3 [1 mark]

- 0.3%
- 3%
- 30%
- 33%

3 (c) Three of these fractions are equivalent to \( \frac{3}{4} \)

Circle the fraction that is not equivalent to \( \frac{3}{4} \) [1 mark]

- \( \frac{6}{8} \)
- \( \frac{9}{12} \)
- \( \frac{12}{15} \)
- \( \frac{15}{20} \)
4 (a) Here is a linear sequence.

..... 13 21 29 37

The first term is missing.

Work out the first term.

[1 mark]

Answer

4 (b) Here is a different linear sequence.

11 17 23 29 ..... ..... 

Work out the next two terms.

[1 mark]

Answer and

4 (c) Work out an expression for the \( n \)th term of the sequence

11 17 23 29 ..... 

[2 marks]

Answer
Here are six numbers.

1  2  4  6  8  12

Put the numbers into the circles so that
all of the numbers are used
and the product of the three numbers on each side is 48

[3 marks]

You may practise on this diagram.

Put your answer on this diagram.
6 (a) Work out $\frac{3}{5}$ of 45

............................................................................................................................................
............................................................................................................................................
Answer ..............................................................................

6 (b) Work out $\frac{1}{3} \times \frac{1}{5}$

............................................................................................................................................
............................................................................................................................................
Answer ..............................................................................

*7 A company has 8 minibuses.
Each minibus can carry 14 passengers.

The company wants to take 98 people on a trip.

Does the company have enough minibuses?
You must show your working.

............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
Answer ..............................................................................
Pat works 38 hours.
She works 28 hours from Monday to Friday and 10 hours on Saturday.

Her normal pay is £7 per hour. On Saturday her pay per hour is 20% more.

Work out her total pay. [4 marks]

Answer £ .................................................................
9 (a) Write these numbers in order, starting with the smallest.

0.7  0.684  0.81

[1 mark]

Smallest .................................................................

..........................................................................

Largest .................................................................

9 (b) Work out 0.3 \times 0.2

[1 mark]

..........................................................................

..........................................................................

Answer .................................................................

9 (c) Work out 0.6 – 0.37

[1 mark]

..........................................................................

..........................................................................

Answer .................................................................

Turn over
The cost of a taxi ride is given by the formula

\[ C = 4.5 + 0.5m \]

\( C \) is the cost in pounds.
\( m \) is the number of miles.

*10 (a) Work out the cost for 18 miles. [2 marks]

Answer £ ..........................................................

10 (b) Sidrah paid £17.50 for her taxi ride. How many miles did she travel? [2 marks]

Answer ............................................................. miles
Tom took three tests. Here are his results.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>13 out of 20</td>
</tr>
<tr>
<td>Maths</td>
<td>37/50</td>
</tr>
<tr>
<td>Science</td>
<td>125 out of 200</td>
</tr>
</tbody>
</table>

Write his results as percentages.

[3 marks]

English ................................................................. %
Maths ................................................................. %
Science ................................................................. %
Ruth left her office at 1400
She drove to two meetings and then drove home.

The distance-time graph shows her journeys.
12 (a) How many minutes was she stopped altogether? [1 mark]
............................................................................................................................................
............................................................................................................................................

Answer ......................................................................... minutes

12 (b) How many miles did she drive altogether? [1 mark]
............................................................................................................................................
............................................................................................................................................

Answer ............................................................. miles

12 (c) On which part of the journey was her speed the fastest?
Circle your answer.

A                       C                       E                       F

Turn over for the next question
13  \( m \) is the number of marbles in Bag A.

Bag B has six more marbles than Bag A.
Bag C has twice as many marbles as Bag B.

\[
\begin{align*}
\text{Bag A} & : m \\
\text{Bag B} & : m + 6 \\
\text{Bag C} & : 2(m + 6)
\end{align*}
\]

13 (a) Write an expression for the number of marbles in Bag C.  

[2 marks]  

\[ 2m + 12 \]  

Answer \[ 2m + 12 \]

13 (b) Altogether there are 66 marbles.

Work out the number of marbles in Bag A.  

[3 marks]  

\[
\begin{align*}
2m + 12 + m + 6 + m &= 66 \\
4m + 18 &= 66 \\
4m &= 48 \\
m &= 12
\end{align*}
\]

Answer \[ m = 12 \]
14 Here are five expressions.

<table>
<thead>
<tr>
<th>A</th>
<th>2x</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>x^2 + 4x</td>
</tr>
<tr>
<td>C</td>
<td>3x</td>
</tr>
<tr>
<td>D</td>
<td>2x - x^2</td>
</tr>
<tr>
<td>E</td>
<td>x^2 + 3x</td>
</tr>
</tbody>
</table>

When you add two of the expressions the answer is 6x.
Which two expressions?

..................................... and .....................................

[1 mark]

15 \[ N = 2a + b \]

a is a two-digit square number.
b is a two-digit cube number.

What is the smallest possible value of N?

............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................

Answer ...........................................................................

[3 marks]
Here are two offers for batteries.

**OFFER A**
Pack of 4
£2.52
\( \frac{1}{3} \) off

**OFFER B**
Pack of 5
£2.75
Pay for 3 packs get 1 free

Zak wants to buy 40 batteries.

Which is the cheaper offer?
You **must** show your working.

[5 marks]

............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................
............................................................................................................................................

Answer .................................................................
Here are two number machines.

When the inputs are equal,
show that the difference between the outputs is always 8

[3 marks]
18 (a) Write 132 as a product of prime factors. [2 marks]

Answer ..............................................................

18 (b) Work out the Highest Common Factor (HCF) of 110 and 132 [2 marks]

Answer ..............................................................
19 Use approximations to estimate the value of $\frac{3.92^2}{0.48}$ [2 marks]

Answer .................................................................

20 Divide £5600 in the ratio 5 : 3 [2 marks]

Answer £ £ £ £