Please write clearly in block capitals.

Centre number    Candidate number
Surname
Forename(s)
Candidate signature

GCSE
MATHEMATICS (LINEAR)

Foundation Tier     Paper 1

Wednesday 2 November 2016     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 70.
• The quality of your written communication is specifically assessed in Questions 7, 14 and 16. These questions are indicated with an asterisk (*).
• You may ask for more answer paper, tracing 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.
Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

Volume of prism = area of cross section $\times$ length
Answer all questions in the spaces provided.

1 (a) Circle the number that is a multiple of 9 [1 mark]

3  49  72  109

1 (b) Circle the number that is a factor of 180 [1 mark]

36  40  120  360

1 (c) Circle the number that is 3 less than a square number. [1 mark]

9  28  46  98

1 (d) Circle the fraction that is equal in value to 0.4 [1 mark]

\[
\frac{1}{40} \quad \frac{1}{4} \quad \frac{2}{5} \quad \frac{1}{2}
\]
Work out

2 (a) \( 625 - 189 \) \[1 \text{ mark}\]

Answer ____________________________

2 (b) \( 7 \times 24 \) \[1 \text{ mark}\]

Answer ____________________________

2 (c) \( 336 \div 8 \) \[1 \text{ mark}\]

Answer ____________________________
3. Draw a suitable diagram to show this data.

<table>
<thead>
<tr>
<th>Type of tree</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash</td>
<td>8</td>
</tr>
<tr>
<td>Beech</td>
<td>6</td>
</tr>
<tr>
<td>Oak</td>
<td>7</td>
</tr>
<tr>
<td>Pine</td>
<td>2</td>
</tr>
</tbody>
</table>

[3 marks]
4 Fitness classes cost £6 per person.

4 (a) 16 people go to the class on Monday.

Work out the total paid on Monday.

Answer £ ____________________________

4 (b) On Tuesday the total paid is £126

How many people go to the class on Tuesday?

Answer ____________________________

4 (c) The teacher says,

“The total paid on Wednesday was £37.”

How can you tell that she has made a mistake?

______________________________
______________________________
______________________________
4 (d) The table shows the number of people who go to the classes on Thursday, Friday and Saturday.

<table>
<thead>
<tr>
<th>Class</th>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>13</td>
</tr>
<tr>
<td>Friday</td>
<td>11</td>
</tr>
<tr>
<td>Saturday</td>
<td>16</td>
</tr>
</tbody>
</table>

The teacher earns 90% of the total paid.

How much does the teacher earn altogether on these three days? [4 marks]

Answer £ __________________________________________

Turn over for the next question
In a game, players take turns to put counters on a board. The winner is the first to get a line of 4 counters.

Example

![Game Board](image)

5 (a) In this game

Black has counters on (3, C) and (3, D)
White has counters on (2, C), (4, B) and (4, C)

It is Black’s turn to play.
He can put a counter on one of two squares so that he can win on his fourth go.

Which squares are they?

Answer (________, ________) or (________, ________)
In this game, it is White’s turn to play.

5 (b) Give a reason why White cannot win. [1 mark]

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

5 (c) Where should White play so Black cannot win? [1 mark]

Answer     (__________, __________)

Turn over for the next question
6 (a) Shade 6 more squares so that the grid has rotational symmetry and no line symmetry

[2 marks]

Practise on this grid.

Answer on this grid.
6 (b)  Here is a pattern of squares.

Some of the squares are shaded.

Work out the fraction of the whole pattern that is shaded.

Answer ________________________

Turn over for the next question
7 Monty buys 4 bottles of juice. The bottles cost £1.90 each.
He pays with a £10 note.

*7 (a) How much change does he get? [2 marks]

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Answer £ _______________________________

7 (b) Monty gets the smallest number of coins possible in his change.
What coins does he get? [1 mark]

______________________________________________________________________________
Answer ________________________________
8 (a) Circle the value of $3^4$ [1 mark]

12  27  34  81

8 (b) Which of these numbers rounded to 1 decimal place does not give an answer of 3.8? Circle your answer. [1 mark]

3.75  3.799  3.7499  3.8499

9 In a car park there are 30 cars.
   One-third of the cars are red.
   20% of the cars are silver.
   The rest of the cars are black.

One of the cars is picked at random.

Work out the probability that it is a black car. [4 marks]

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Answer ____________________________________________
The table shows the eye colour of 30 students.

<table>
<thead>
<tr>
<th>Eye colour</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>15</td>
</tr>
<tr>
<td>Blue</td>
<td>10</td>
</tr>
<tr>
<td>Green</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

Draw a fully labelled chart to show the data. [3 marks]

Pie chart to show eye colour of 30 students
11 (a) Solve \( \frac{x}{3} = 7 \) [1 mark]

\[ x = \] 

11 (b) Solve \( y - 11 = 12 \) [1 mark]

\[ y = \] 

11 (c) Solve \( 5w - 3 = 3w + 15 \) [3 marks]

\[ w = \] 

Turn over for the next question
Six whole number cards are put in order.

All the numbers are different.
The smallest number is 2
The median is 5
The six numbers add up to 30

Complete the numbers on the cards.

[3 marks]

Answer

2  
A spinner has four sections A, B, C and D. The table shows the probabilities of the spinner landing on A, B or C.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td>0.2</td>
<td>0.3</td>
<td>0.15</td>
<td></td>
</tr>
</tbody>
</table>

Work out the probability of landing on D. [2 marks]

Answer ____________________________

Turn over for the next question
Here is a drink container and a lunch box.

The drink container is a cuboid with a square base.
The area of the base = 25 cm²
The volume of the container = 400 cm³

Will the container fit inside the lunch box?
You **must** show your working.

[4 marks]
15 Here is a scale drawing of a park.

15 (a) What is North-West of the Bandstand?
Circle your answer.  

[1 mark]

| Lake | Toilets | Café | Playground |

15 (b) Measure and write down the 3-figure bearing of the Playground from the Lake.  

[2 marks]

Answer  

15 (c) A Tower is  
North of the Toilets  
and  
on a bearing of 220° from the Café.

Mark the position of the Tower on the scale drawing.  

[2 marks]
A parallelogram $ABCD$ and a triangle $DCE$ are joined as shown. $BCE$ is a straight line.

Show that $DCE$ is an isosceles triangle. You must show your working. [4 marks]
Field A is a rectangle with sides of 30 m and 70 m.
Field B is a square with the same perimeter as Field A.

How much bigger in area is Field B than Field A?
You must show your working.

Answer ___________________________ m²
18 Work out 210 as a product of its prime factors. [2 marks]

Answer ____________________________________________

19 Here are the first five terms of a linear sequence.

9 15 21 27 33 ...

Work out the $n$th term. [2 marks]

Answer ____________________________________________
Here is a regular polygon.

Work out the size of an interior angle. You **must** show your working.

[2 marks]

Answer ______________________ degrees

END OF QUESTIONS