AQA

General Certificate of Secondary Education
Foundation Tier
June 2014

Mathematics 43601F

Unit 1

Tuesday 17 June 2014 9.00 am to 10.00 am

For this paper you must have:
• a calculator
• mathematical instruments.

Time allowed
• 1 hour

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.

Information
• The marks for questions are shown in brackets.
• The maximum mark for this paper is 54.
• The quality of your written communication is specifically assessed in Questions 1 and 4. 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 club rents films. These were the films rented on Monday.

Films rented on Monday

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Comedy</td>
<td>12</td>
</tr>
<tr>
<td>Thriller</td>
<td>6</td>
</tr>
<tr>
<td>Romance</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27</strong></td>
</tr>
</tbody>
</table>

1 (a) Draw a pictogram for this data.

Use [ ] to represent 4 films.

Films rented on Monday

Key: [ ] represents 4 films

<table>
<thead>
<tr>
<th>Comedy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thriller</td>
<td></td>
</tr>
<tr>
<td>Romance</td>
<td></td>
</tr>
</tbody>
</table>
*1 (b) This pictogram represents the films rented on Tuesday.

Films rented on Tuesday

Key: ☺☺☺☺☺ represents 2 films

<table>
<thead>
<tr>
<th>Comedy</th>
<th>☺☺☺☺☺</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thriller</td>
<td>☺</td>
</tr>
<tr>
<td>Romance</td>
<td>☺☺☺</td>
</tr>
</tbody>
</table>

The club manager says,

“Looking at the total number of films rented on **Monday and Tuesday**, half of them were Comedy.”

Is he correct?
You **must** show your working.

[3 marks]

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............................................................................................................................................
2 Here are some cards.

A card is picked at random.

2 (a) Circle the chance that the card has a square on it.

impossible    unlikely    evens    likely    certain

[1 mark]

2 (b) Circle the chance that the card has a triangle on it.

impossible    unlikely    evens    likely    certain

[1 mark]
The tables show two sets of data.

<table>
<thead>
<tr>
<th>Result</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

3 (a) Liam says,

"Set A has the higher mode."

Is he correct?
You must show your working.

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

[2 marks]

3 (b) Liam says,

"Set A has the larger range."

Is he correct?
You must show your working.

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

[2 marks]
Mira sells ice creams and lollies. 
The bar chart shows the number sold on Friday and Saturday.

*4 (a) An ice cream costs £1.20
A lolly costs 80p.

How much money did Mira take from selling ice creams and lollies on Friday? [3 marks] 

Answer £ ………………………………………………………………………
4 (b) Mira sold ice creams and lollies on Friday, Saturday and Sunday. Altogether she sold 80.

On Sunday, she sold 2 more lollies than ice creams.

Complete the bar chart for Sunday. [3 marks]

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

Turn over for the next question
5 The table shows information about 80 shirts in a shop.

<table>
<thead>
<tr>
<th></th>
<th>slim</th>
<th>tailored</th>
<th>regular</th>
<th>classic</th>
</tr>
</thead>
<tbody>
<tr>
<td>grey</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>blue</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>purple</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>white</td>
<td>11</td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

5 (a) How many of the shirts are white slim? [1 mark]

Answer

5 (b) What fraction of the 80 shirts are purple classic? Give your answer in its simplest form. [2 marks]

Answer

5 (c) How many of the shirts are tailored? [1 mark]

Answer

5 (d) How many of the blue shirts are slim or regular? [1 mark]

Answer
6 In a game, players roll two ordinary, fair six-sided dice. The numbers rolled are added to get a score.

6 (a) Complete the table of possible scores.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 (b) What is the most likely score?

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

6 (c) To win a prize a player must score 8.

Work out the probability of winning a prize.

Answer .................................................................
7 The diagram shows information about the exports of a company.

7 (a) Work out the increase in the exports from 2009 to 2010. [2 marks]

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

Answer £ ........................................................ million

7 (b) Write the value of the exports in 2011 to 1 significant figure. [1 mark]

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

Answer £ ........................................................ million
7 (c) The pie chart shows information about the exports of the company in 2012.

**Exports in 2012**

- EU: 45%
- USA: 28%
- Asia: 15%
- Africa: 12%

Use **both** diagrams to work out the value of the exports to the **USA** in 2012.  

[3 marks]

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

Answer £ ........................................................ million
8 A, B and C are sets of three cards.

8 (a) Set B has the same **total** as Set A.
Set B has the same **median** as Set A.

Complete the cards in Set B.

\[
\begin{array}{ccc}
\text{Set A} & \text{12} & \text{18} & \text{15} \\
\text{Set B} & \quad & \quad & \quad \\
\end{array}
\]

8 (b) Set C has the same **total** as Set A.
Set C has the same **range** as Set A.

Complete the cards in Set C.

\[
\begin{array}{ccc}
\text{Set A} & \text{12} & \text{18} & \text{15} \\
\text{Set C} & \text{17} & \quad & \quad \\
\end{array}
\]

[2 marks]
9 (a) Lucy thinks people prefer dogs to cats.

She asks dog owners,

“Do you prefer dogs or cats?”

Is the data likely to be biased?
Give a reason for your answer.

[1 mark]

9 (b) Sam asks 30 people,

“Do you prefer dogs or cats?”

One-fifth of the 30 people have no preference.
Twice as many choose cats as choose dogs.

Complete the table.

[3 marks]

<table>
<thead>
<tr>
<th>Frequency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs</td>
<td></td>
</tr>
<tr>
<td>Cats</td>
<td></td>
</tr>
<tr>
<td>No preference</td>
<td></td>
</tr>
<tr>
<td>Total = 30</td>
<td></td>
</tr>
</tbody>
</table>
This table shows information about the weights of 200 rabbits.

<table>
<thead>
<tr>
<th>Weight, $w$ (grams)</th>
<th>Frequency</th>
<th>Midpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>$60 &lt; w \leq 70$</td>
<td>101</td>
<td>65</td>
</tr>
<tr>
<td>$70 &lt; w \leq 80$</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>$80 &lt; w \leq 90$</td>
<td>25</td>
<td>85</td>
</tr>
<tr>
<td>$90 &lt; w \leq 100$</td>
<td>10</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total = 200</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10 (a) Tick whether each statement is true or false. [1 mark]

- You can use the table to calculate the exact median. 
  - True [ ] False [ ]
- You can use the table to work out the weight of the heaviest rabbit. 
  - True [ ] False [ ]

10 (b) Calculate an estimate of the mean weight of the 200 rabbits. [3 marks]

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

Answer ........................................................................................................................................ grams
10 (c) Here are the weights, in grams, of 10 more rabbits.

76.2  89.4  93.1  99.7  86.8  79.2  82.6  91.9  88.0  95.4

Complete the table with:
- tallies for these 10 rabbits
- the frequencies for all 210 rabbits.

[2 marks]

<table>
<thead>
<tr>
<th>Weight, ( w ) (grams)</th>
<th>Tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 &lt; ( w ) ≤ 70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 &lt; ( w ) ≤ 80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 &lt; ( w ) ≤ 90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 &lt; ( w ) ≤ 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total = 210

10 (d) Which two of these diagrams could you use to represent this grouped data? Circle your answers.

[1 mark]

stem-and-leaf frequency polygon scatter graph histogram
The scatter graph shows the lengths and widths of 20 birds’ eggs.

11 (a) One of the eggs has a length of 52 mm.
What is its width?

Answer ............................................................... mm

11 (b) All the points except one show strong correlation.
Circle the point that does not fit this pattern.

[1 mark]
Match each scatter graph with a description. The first one has been done for you.

- Strong positive correlation
- Weak positive correlation
- Little or no correlation
- Weak negative correlation
- Strong negative correlation

Turn over for the next question
12 (a) A **fair** coin is thrown five times. These are the results.

```
tails heads heads heads heads
```

The coin is thrown again.

Write down the probability that it will land on tails this time. [1 mark]

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

12 (b) Jon has made a ten-sided spinner.

Describe **fully** how he can test whether it is fair or biased. [2 marks]

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END OF QUESTIONS
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