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# GCSE STATISTICS

8382/2F: Paper 2 Foundation  
Report on the Examination

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8382  
June 2019

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Version: 1.0

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## General

This was Paper 2 for the Foundation Tier in the first sitting of the new GCSE Statistics specification. Students showed good knowledge throughout the paper and seemed comfortable, in many cases, with the increased emphasis on interpretation and analysis. All questions appeared to be accessible and there appeared to be no time issues as attempts at the last question were as proportionately high as any others.

Topics which were answered well included:

- Completing a stem-and-leaf diagram
- Drawing a pie chart
- Identifying an outlier
- Identifying correlation
- Calculating the total frequency from a table of grouped data
- Reading from a chart or table
- Working out the probability of an event happening or not happening

Topics which students found difficult included:

- Comparing statistically, two sets of data
- Comparing the proportions within two sets of data
- Determining an appropriate graph to display two sets of data
- Interpreting a cumulative frequency graph
- Suggesting improvements to a data collection sheet

### Question 1

This question was well answered.

### Question 2

This question was very well answered.

### Question 3a

This question was not well answered. Over half of students chose one of the incorrect choices 'how well the sample was cooked' or 'which farm the sprouts were from'.

### Question 3b

This question was not well answered. 'The name of the farmer' was the common incorrect answer.

### Question 4

Part (a) was extremely well answered.

In part (b), the vast majority of students identified  $\frac{36}{60}$  as the correct fraction. This was often cancelled fully to  $\frac{3}{5}$  but the most common partial cancelling stopped at  $\frac{9}{15}$ . There were some students who answered with 60%, following the correct fraction of  $\frac{36}{60}$ .

In part (c), questions of this type, a full comparison is expected, with calculations to support the written comment. Students should use their total numbers of teachers to give the position of each school in relation to the other two. Many students completed the calculations but only gave a partial comparison, for example, telling us that Ridge has the most teachers.

In part (d), most students concentrated on the number of male/female teachers rather than the proportion of male/female teachers. The fractions/ratios were often not converted to comparable form, meaning the middle mark couldn't be awarded. Many students answered using  $\frac{2}{12}$  instead of  $\frac{2}{14}$  but only on that particular fraction.

### Question 5

Part (a) was well answered.

In part (b) most students knew exactly how to tackle this question but the others didn't understand that the column for market share should total 100. Those students, who worked out the relationship between the columns for Number of Sales and Market Share and applied it to the correct row, often lost a mark for accuracy, due to premature rounding during the calculation.

Many of the incorrect answers in part (c) were derived from focussing on a single company rather than a set of three companies.

### Question 6

Part (a) was well answered with the majority of students giving exactly the right answer and many others giving a correct denominator.

Part (b) was also well answered. The most common error was  $\frac{1}{12}$ , giving the probability that the arrow did stop on yellow, rather than did not stop on yellow.

### Question 7

Question part (a) was not looking for daily analysis, but rather how the data behaved throughout the week as a whole. Most students knew not to describe correlation, although those answers appeared occasionally.

The pie chart in part (b) was generally well done with the majority of students demonstrating their ability to correctly calculate the necessary angles. Those that attempted to work with percentages usually made errors.

When choosing a diagram to draw in part (c), a time series graph was not an appropriate choice but there were many excellent attempts at dual bar charts and stacked/composite bar charts. As expected, the stacked bar charts did not perform as well as the dual bar charts because students forget to add on the second value before plotting, they merely plotted the second value as the total height. On this type of question, it is expected that the axes are ruled and labelled.

In part (d) the statements were well attempted with most students attempting full reasons with supporting calculations for each statement.

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**Question 8**

Part (a) was fairly well answered but many responses were incorrect with the most common error being to give an answer of 50.40 and ignore the instruction to give the answer to one decimal place.

Part (b) required the students to notice that the cumulative frequency graph started after the 50.00 shown on the horizontal axis and be able to explain that effectively. Those who attempted to answer the question and did not score often said that “some” of the balls of wool were over 50g, rather than “all” of the balls of wool were over 50g.

In (c)(i) the most common incorrect answer as “Yes, when rounded, they are all at least 50” or gave some reference to the median.

Part (c)(ii) was not very well done with only a small number of students scoring more than 2 marks out of 6. The majority of answers consisted of comparing the largest and smallest masses for each supplier. Those attempting to read off the cumulative frequency graph often used the 2nd cross as the lower quartile, the 5th cross as the median and the 7th cross as the upper quartile, instead of the 100 balls of wool.

**Question 9**

Many students in part (a) phrased their “hypothesis” as a question. Other mistakes included only giving a partial hypothesis such as “Older people go on the internet more.” which leads us to ask ourselves “more than what?”.

The question asked in part (b) was not “Give two criticisms of the data collection sheet”, but “suggest two improvements to the data collection sheet” – many of the incorrect responses were due to students criticising the data sheet, rather than trying to improve it. Many students who were probably trying to suggest that a time frame was needed, instead, incorrectly suggested that units of time were necessary.

There were many incomplete reasons in part (c) along with the incorrect answer that “it will take longer to collect exact data”. There was no appreciation of the difference between an exact and an estimated mean.

Part (d)(i) was fairly well answered and there were some excellent answers criticising the age of people but also the slightly muddled common wrong answer of “she only asked people aged 10-30”.

The outlier was easily identified by the vast majority of students in part (d)(ii) and it was pleasing to see so many students comment upon the positive correlation.

The most common error in (d)(iii) was to explain what positive (or negative) correlation looks like on a graph, and not in context.

Part (e)(i) was well answered. The students found it difficult to give the range from grouped data in part (e)(ii). Many students answered instead with the modal group.

In part (e)(iii) many students knew to find the midpoint and multiply across, although we did see 1.3, 2.3, 3.3 etc frequently used as the midpoints. Some of those who knew to multiply midpoint by frequency were usually able to total but not divide to get to the 1.3 hours given in the question.

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In the final part (f) of this structured question assessing the Statistical Enquiry Cycle, students were expected to contextualise the findings from the two sets of data. It is not enough to say, for example, that one group had a mean of 0.3 hours greater than the other group, or re-state the numbers given in the questions.

### **Question 10**

Part (a) was well answered with the majority of students giving the correct two regions and no others. The most common reason for not scoring the mark was to include additional regions or to miss one of the two correct regions.

In part (b) when describing the misleading diagram's issues, most students were able to identify that the larger bars had the smaller speeds and a few students also mentioned the lack of units/scale.

Most students made very good attempts in part (c)(i) in completing the back to back stem-and-leaf diagram with a loss of marks mainly due to one number slipping into the wrong row or for leaving the leaves unordered.

In part (c)(ii) incorrect answers to this question saw descriptions of how long people spend shopping, rather than comparisons of the walking speeds but many students were able to identify that shoppers walked more quickly on average in June than in December.

In part (c)(iii), the students were trying very hard to put their answers into context, but ended up talking about the temperature rather than conditions underfoot when referencing the weather.

### **Question 11**

Part (a) was well answered with the majority of students correctly identifying 2013 as the year in which attendances fell. The most common incorrect answer was 2008.

In part (b) when continuing the given graph, the most common errors were to incorrectly plot a point or to leave 'millions' off the y-axis title.

The most common incorrect responses in part (c) were where students were concerned that the data below 19.5 would be lost and confused answers trying to use the 'break' to describe the working day of hospital staff.

Most students in part (d) were able to contextualise the question and answer that there may have been an increase in the number of staff/hospitals or those more severe injuries would be treated more quickly than less severe injuries.

### **Question 12**

The Venn diagram question in part (a) was very well attempted and the most common error was to miss out the placing of the three zeros or writing other values in their places.

Very few students answered part (b) completely correctly. When 40 appeared as the numerator, it was often incorrectly accompanied by 100 as the denominator. 100 as a denominator was the most common incorrect answer.

### **Mark Ranges and Award of Grades**

Grade boundaries and cumulative percentage grades are available on the [Results Statistics](#) page of the AQA Website.