



**General Certificate of Secondary Education
March 2012**

Mathematics

43601H

(Specification 4360)

Unit 1: Statistics and Number (Higher)

Report on the Examination

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General

Students seemed well prepared for the examination. There were fewer blank responses than in previous series and most students completed the whole paper. There was evidence that more students were using calculators than previously.

Topics that were well done included:

- drawing a stem-and-leaf diagram and finding the median
- drawing a scatter diagram and line of best fit
- completing a two-way table
- drawing a box plot
- calculating a stratified sample.

Topics which students found difficult included:

- interpreting a pie chart
- interpreting a cumulative frequency diagram
- problem involving bounds.

Question 1

The stem-and-leaf diagram proved to be a good start to the paper with most students producing an accurately ordered and aligned diagram. In part (b) the majority stated the correct value for the median. The common error was to find the $\frac{n}{2}$ th value. Occasionally students calculated the mean. In part (c) students who increased the original median by 5% generally did so accurately. Finding the increase as a percentage of the original median was also seen. Some found the increase as a percentage of the new median. No conclusion or an incorrect conclusion were both common.

Question 2

Students performed well on this question with many fully correct responses seen. Occasionally, the line of best fit was not attempted or a curve was drawn. In part (c), some students did not appreciate that values are estimates when using a scatter diagram and so the common incorrect answer was 'No'.

Question 3

Almost all students scored highly on this question which assessed a variety of skills. The ratio proved to be the greatest challenge. In part (b) most were able to explain why the sample was not representative.

Question 4

Many students did not realise that they needed to measure the appropriate angle(s) in the pie chart. Those who measured an angle were then usually able to progress through the question. The most successful method was to compare their total angle with 40% of 360° .

Question 5

Many students missed the distinction between the mean of five times and the mean of the middle three times. However, most calculated Oscar's overall mean or the required mean of his three middle values. Usually their mean was then compared with the given mean for Erik's five times, with few students appreciating the need to calculate Erik's new mean. Those who realised that Erik's total of five times was the correct first step to his new mean, were usually successful.

We would like to apologise for the transcription error that appeared in Erik's slowest time. As a result of this error, this question was only marked by the senior examining team. The vast majority of students answered the question as intended and seemed to be unaware that Erik's resulting mean of three values was inconsistent with the slowest time given. There was evidence that a handful of students had noticed the error and the scripts for these students were reviewed separately and steps taken to ensure these students were not disadvantaged in any way.

Question 6

Students generally found the cumulative frequencies accurately and were usually able to produce an appropriate diagram. Some plotted at the midpoints rather than using upper class boundaries and a large number drew block diagrams. Part (c) was not well answered. Many misread the horizontal scale and found the number of fish shorter than 11 inches. Despite the fact that a large number of students managed to read a value from the graph, few completed the question.

Question 7

The vast majority of students drew an accurate box plot in part (a). In part (b) most were able to comment on a measure that remained unchanged. Only a small number mentioned that the interquartile range was smaller and therefore waiting times were more consistent in the new system. In part (c) most understood how to find a stratified sample and completed the calculation accurately.

Question 8

Students had a better understanding of histograms than has been seen in previous series. Those who used frequency densities to work back to the frequencies sometimes misread the scale. Some students used a counting squares method which proved difficult in this particular case. Part (b) proved a challenging question for all but the most able. Some students stated a correct bound and made no further progress. Others worked out a reverse percentage without using the bounds.

Question 9

In part (a) students who used a tree diagram were the most successful. There was evidence of some well constructed step-by-step explanations. Those who attempted to work back from the given answer were unsuccessful. Students found part (b) more challenging. Again tree diagrams were used with success, although students should be encouraged to write the resulting multiplications of probabilities at the ends of the relevant branches. However, many students worked with probabilities assuming replacement.

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