Pearson Edexcel

Examiners' Report
Principal Examiner Feedback

Summer 2024

Pearson Edexcel GCSE
In Statistics (1ST0)
Foundation Paper 1F

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GCSE (9 – 1) Statistics – 1ST0 Principal Examiner Feedback – Foundation Paper 1

Introduction

General comments

Students were generally able to attempt the whole paper within the time allowed. Students performed well on the first five questions, and there were varying degrees of success on most of the remaining questions. Question 6 proved to be more challenging for candidates to with many not using statistical processes correctly. Most candidates were able to access some early parts of these later questions and pick up valuable marks.

Question 1

The familiar context of this question of holidays or trips out and buying ice creams meant that candidates could relate to the given scenario, and it was generally well answered.

In part (a), most candidates understood that they needed to draw two and a half circles to represent the number of chocolate ice creams sold.

In part (b), candidates had to calculate the number of vanilla and strawberry ice creams sold and then add this to 20 chocolate ice creams. Many candidates chose to list the three totals, add them and, in most cases, this resulted in the correct answer. Some candidates lost marks by dismissing the "20" chocolate ice creams given in the question and instead worked out that total by using their incorrect circles drawn from part (a).

For part (c), most candidates correctly found that on Saturday 18 vanilla ice creams were sold and on Sunday 45 vanilla ice creams were sold. Other candidates chose to state the difference in the two days. In some instances, candidates forgot to give a comparison and state which day sold more. A common misconception seen was when candidates chose to ignore the different keys and state their comparison that the number of ice creams sold was the same.

Overall, part (d) was answered well, again due to the context, with many candidates choosing to refer to either the weather, weekend/weekdays or the lack of data. Some candidates forgot to make an ultimate decision as to whether Pradeep's method was appropriate.

Question 2

This question required candidates to complete and interpret the multiple bar chart. Candidates were generally successful in completing the bar chart with the labels and the bars for Germany in 2003 and 2013. The vertical axis label proved the more challenging as many candidates omitted the key word of "percentage" or failed to use "%" as part of their label.
In part (c), candidates were able to interpret the multiple bar chart well and often stated the percentage changes of France with 12% and UK with 8%. Better responses articulated that these were an increase for France and a decrease for the UK.

Question 3

The use of popular television soaps provided another familiar context for the candidates who were able to correctly interpret the table of data for part (a) to extract the correct year and the highest viewing figures.

In part (b), candidates tended to reference to the unreliability of the source data or the different ways in which people can watch television programs as the reason why the viewing figures may not have been accurate.

For part (c), whilst the majority stated the number of episodes for both programs or the difference in these totals, a similar issue was seen to that in question 1c whereby a few candidates did not always provide a reason and a comparison.

Many candidates did not attempt part (d), this was perhaps because they missed it. Candidates generally are successful when asked to plot two points. Those that did attempt it were able to plot the first point more accurately than the second, perhaps because it should have been very close to the point drawn for Eastenders.

The last part of this question, part (e), was answered well with many correctly stating that the trend was decreasing. Those that did not score the mark generally gave one of two answers; referencing to negative correlation or by stating the figures for 2015 and 2018 or the difference rather than communicate the trend.

Question 4

It general this question was well answered across the different parts, with many candidates successfully calculating the required summary statistics and comparing them.

In part (a), deciding the data type of the basketball scores was challenging, with many candidates failing to choose the correct word "discrete" and often choosing to select "continuous" perhaps due to recognising the numerical nature of the data.

For part (b), candidates proved successful in calculating the median of 80 by ordering some, or all, of the data. Those that were less successful did not order the data or omitted one, or more, pieces of data.

For part (c), an advantage of using the median was rarely stated, however candidates that were successful often stated that it was quick or easy or quick and easy to calculate it.

Calculating the range in part (d) was very well answered with many candidates calculating it correctly using the maximum and minimum values from the data.

The final part of the question, part (e), where candidates were required to compare and interpret the performance of the basketball team at the start and the end of the season, was also completed well. Many candidates were able to access two marks by comparing the medians and the range or by comparing one and interpreting it in context. Similarly to previous comparison questions, candidates were able to state values but did not always convey which was greater or less. However, many were able to expand upon their stated values, interpreting them in the context of the question. It was also pleasing to see the number of candidates that understood a lower range means more consistency in the data.

Question 5

This probability question about two spinners was attempted well. Most candidates were able to successfully complete the sample space diagram in part (a) and go on to state the probability of scoring a total score of 3 in part (b).

It was surprising to see errors in the table when most totals were correct. When candidates did make errors in the totals, they were able to still pick up the mark in part (b) for 'their' probability. However, this was rarely seen either because the total number of 3s was unchanged or candidates did not know how to find the required probability. A common misconception was counting the two 3s in the table headers.

In part (c), candidates were less successful at understanding what they had to do to find the probability that the spinner shows the same score. They struggled to use the table headers and relate the totals to how they were calculated. There were many blank responses and others repeated their answer from the previous part.

The last part, (d), was generally well reasoned with many candidates able to interpret the table and state that the frequency for '1' was too high or greater than all the other scores. Most candidates recognised that this question required a decision and often started their response with either 'yes' or with 'Carol is correct'. Where candidates answered this incorrectly, they often referenced the spinner having four sides with the same chance of landing on each and not recognising the structure of a biased spinner.

Question 6

The different parts of this question were generally not answered well, many candidates found these questions, on the statistical enquiry cycle, challenging. In part (a) candidates were not good at stating a hypothesis for the given context, they often repeated the question or stated a plan that the manager would undertake.

Candidates also struggled to understand that choosing every 20th person represented a 'systematic' sample in part (b). However, it was clear that candidates knew the different sampling methods as there was an even split of the correct answer with either random or stratified.

Similarly, in part (c), many candidates were not able to give a valid reason why this form of sampling was a good plan. The best responses were able to articulate the benefits of saving time, money, convenience, and ease. Other successful responses referenced to being fair or unbiased.

In part (c) (ii), only a minority of candidates were either able to arrive at two comparable figures (150 and 75) or to understand/calculate that every 20th person was 5% and relate that to the 10% in the plan.

In part (d), candidates generally chose to rewrite the question and in doing so exemplified the improvements that were required. In most cases they were able to remove 'do you agree' or change the question so that it is not leading. Less commonly seen was the inclusion of response boxes or suggesting options to be selected.

Generally, for part (e), candidates were unable to state that the pre-test would be a 'pilot study'. However, they were more successful in giving at least one reason why the manager might do this – often by reviewing if the questions work, checking the solutions or for improvements to be made.

In the last part, (f), many candidates were able to correctly answer this part by stating the manager might want to take feedback from non-members or that in making changes they may decide to buy a membership.

Question 7

The pie charts representing the different types of properties were interpreted well with many candidates able to pick out that Harrogate had, proportionally, more houses and/or South Shields, proportionally, had more bungalows. There were a range of other possible comparisons using the smaller proportional properties of flats and/or other. Where candidates offered a generalisation that there were

proportionally more houses than any other type of property in Harrogate and/or South Shields then this was also recognised as a valid comparison. It was condoned when candidates referenced to the number of properties or the angles rather than proportion of each as this was tested later in this question.

In part (b), candidates had to demonstrate that they understood the difference between proportions and the number of properties. The best responses clearly articulated this well or by stating that it could be possible if the total number of properties, in both Harrogate and South Shield, were the same.

Question 8

This was a common question with the higher tier question. Most candidates were only able to pick up marks on some parts of the question. Specifically, foundation candidates understood that they needed to sum some of the frequencies to find the number of fjords at least 100km long. Those that were able to select the three correct frequencies were able to find the required total of "16". A handful of candidates that showed working did not obtain the correct answer could be awarded credit for the correct method.

In part (b), only a few candidates were able to find an estimate for the mean and all the common misconceptions were seen; most common was to add the frequencies and divide by five. Although candidates were not able to calculate an estimate for the mean they were able to pick up marks by referring to the fact that the data was grouped or that they did not know the actual lengths in part (ii). In part (iii) candidates generally used their previous answer to suggest correcting that to improve the accuracy.

It was rare to see a correct response that offered a reason why or a reason why not a frequency polygon was suitable for part (c). More frequently seen was the suggestion of using an alternative chart or diagram which did not answer the question asked.

Question 9

Again, candidates on the foundation tier struggled with this common question, particularly as it was also an extended response. Those that could often were able to extract the correct percentages from the population pyramid to compare the percentage of people aged 50-54 in France and Italy either as a total (6.6% and 6.8%) or broken down into males (3.2% and 3.3%) and females (3.4% and 3.5%). The very best responses went on to calculate the number of males aged 40-44 in both France and Italy and then go on to secure all the marks by assessing the validity of the two conclusions.

It was common to see a short-written response stating that the first conclusion was correct without any valid statistics communicated.

Sometimes this went on to review the second conclusion without calculating the percentages required to justify their decision, in both cases no marks were scored.

Question 10

Completing the table with the missing inequality and the missing frequency was exceptionally well done. It appeared that candidates were aided from the four inequalities in the table and by the scale which they could easily interpret from the given frequencies but also as it used a scale of 1:1.

In part (b), there were some responses that had no working and arrived at the correct solution of 20 which scored the two marks. A very small proportion of candidates showed the correct working and demonstrated that they had to work out $\frac{3}{5}$ of the frequency for $20 < t \leq 25$ minutes and then add this to the 5 runners that took $15 < t \leq 20$ minutes.

In their final part, there were very few candidates that were able to determine the 'positive' skew as required, and then very few of these were able to interpret the skew.

Question 11

In part (a), the first branch of the probability tree diagram was generally completed correctly. Only a few responses making the error of using the other given probability, 0.45, as the probability that Matthew would win at tennis. Similarly, the second branches were either all correct or all wrong with the similar misconception seen of using 0.35 as the probability that Kyryl wins at squash. Overall, most candidates attempted the first part and there were very few responses seen that were blank.

In part (b), some candidates were able to work correctly with their values from (a) to calculate the probability of Kyryl winning both games and the probability of Matthew winning both games. This extended to the decision made as to whether Matthew was correct in stating that he had more chance of winning both games. Common errors adding the probabilities instead of multiplying.

Summary

Based on their performance on this paper, candidates should:

- read each question fully and carefully before attempting to answer it;
- show working out to support the final answer;
- ensure that they are able to give comparisons as part of a response;
- practice interpreting answers to statistical calculations and diagrams in context;
- practice identifying the appropriateness of calculations, diagrams and approaches;
- give a decision when the question asks for this and support it using the information from the question;
- practice more extended response questions and understand how to break these down with the steps outlined in the question;
- review key terms and processes as part of the statistical cycle, particularly those exemplified in question 6: hypotheses, pilot studies, improving and writing questionnaires and benefits of sampling.

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