Principal Examiner Feedback

Summer 2018

Pearson Edexcel GCE A Level Mathematics

Statistics & Mechanics (9MA0/03)

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SECTION A: STATISTICS

Introduction

This was the first paper in the new specification and sadly there did seem to be some students who were not that well prepared for the change in content and question style. In the statistics section the responses to questions 1 and 5 were particularly poor, with over 50% failing to score any of the marks in question 1

Comments on individual questions

Question 1

This question was supposed to be a gentle starter, making use of the student's knowledge of the large data set. Unfortunately many did not seem to be familiar with this and certainly were not aware that cloud cover was measure in oktas and subsequently there were a number who left the question blank. Those who did know about the cloud cover variable were able to give a discrete uniform distribution but many forgot to include 0. Those who did try and engage with the question could often score in part (c) but responses to part (d) were poor. This question required students to suggest a refinement to Helen's model and most answers lacked the detail required for the mark.

Question 2

This question was answered quite well by most students. In part (a), some failed to give their hypotheses in terms of a population parameter but most quoted the correct critical value from the tables. We would always expect a conclusion to a hypothesis test to be given in context and many students failed to do this.

In part (b) some students identified that as the temperature increased more people would be outside visiting the beach perhaps rather than going shopping. There were several other less convincing suggestions made and some that would have suggested a positive correlation between weekly sales and temperature. Part (c) was answered very well, but in part (d) some students seemed unfamiliar with the term, all that was required was the identification of temperature as the required variable and an explanation that, in this model, sales depend on or are affected by temperature. Part (e) was answered well again with most mentioning the idea of rate and the relevant values.

Question 3

In part (a), we would expect answers to use the context and although many stated that Peta assumes that the probability of hitting the target is constant most did not mention that the throws of the dart had to be independent too, many simply referring to just "trials".

Part (b) was answered fairly well, but in part (c) many carried on using the B(10, 0.1) model finding P($H = 5$) rather than P($F = 5$). Part (d) proved more challenging; those who carefully started to list the probabilities were often able to add these manually (few identified the arithmetic series as intended) and those who realised that the sum of the probabilities was equal to 1 usually went on to score all the marks and the mark in part (e). However, many thought that P($F = 10$) = 1 or even that P($F = 5$) had to equal their answer to part (c) and made little progress in (d) but could often collect the mark in (e). Part (f) was not answered well; the question clearly steered students to comment on the probability of a dart hitting the target using these two models. There were some good descriptions of what was happening with Thomas' model but often these were not compared to Peta's model.

Question 4

This question was answered fairly well. Most students gave a correct response in part (a) and many mentioned quota sampling in part (b). The question required a brief description of the method and although some mentioned "strata" few gave a suggestion as to what these strata might be and a question like this does require the answer to be related to the context of the question. Some mentioned stratified sampling in (b) and gained no credit as this is not a "non-random" method of sampling.

Most answered part (c) correctly and parts (d) and (e) were probably the best answered parts on the whole of section A. Part (f) was a familiar type of question from the legacy S1 specification but, although many identified the median and interquartile range as being the preferred statistics to use far fewer gave a reason to support this based on the presence of the outliers.

In part (g) most students identified that the median and upper quartile would change but few could give an adequate and accurate description to explain why. Many explained that the two values have moved to below 40 but failed to go on to explain that this would mean that there were more than 50% of the values below 40 and so the median of 40 would need to be lower. There were a number of students referring to changes in the mean and standard deviation despite these values not appearing in a box plot. It is hoped that over time students will get better at giving the level of detail in explanation that the new specification requires.

Question 5

Whilst parts (a) and (d) were often answered well, parts (b) and (c) proved much more challenging and only the strongest 10% made significant progress here. Part (a) was answered well and most students knew they needed to use their calculators to answer it and did so correctly. Those who identified that a conditional probability was required in part (b) were often able to make progress, often obtaining the probability of 0.4462 and using that correctly to complete part (b) and make progress in (c).

In part (c), some simply squared their probability of 0.4462 without realising the need to consider the two new batteries as well**.** Part (d) was often answered quite well with many stating the hypotheses correctly and identifying the correct model. Most calculated the appropriate probability correctly and many gave their solution in context too.