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Examiners' Report
Principal Examiner Feedback

October 2017

Pearson Edexcel International A Level
Mathematics
In Statistics (WST01)

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General Introduction

The paper seemed to work very well with almost every question (with the possible exception of question 3) providing an opportunity for all the students to make some progress and the later parts providing discrimination for the top grades. Questions 3 proved to be a particularly good discriminator, but there were plenty of fully correct solutions here as well, whilst question 5 was probably the most accessible with a mean score of just under 9 and nearly half of the students scoring 11 or more marks.

Reports on individual questions

Question 1

This proved to be a good starter with almost all the students making some progress. A common error in part (a) was to take the range from – 28 instead of – 38 and we saw many incorrect answers of 53. Part (b) was answered well though, as were parts (c) and (d) with many showing a sound grasp of the interpolation technique. In part (e) most knew what to do, but a common mistake was to take the interquartile range (IQR) to be 18 (from the original box plot) rather than 12 using the figures given in the question.

Most knew how to draw a box plot but the lower whisker was often drawn to – 26 (the limit for outliers) rather than the correct position of – 25. In part (f) there were a good number who identified that the range or IQR had decreased but fewer commented that the median was closer to zero. Many in fact focussed on the skewness or the number of outliers and gained no marks. A few did identify one or two correct reasons but failed to adequately state whether or not this meant that the apprentice's ability at estimating lengths had improved: just saying "yes" was not sufficient in this case as we expect to see a clear statement that they have improved.

Question 2

In part (a) most students identified B and C as the required events but some wrote P(B) and P(C) and therefore lost the mark. Part (b) was generally answered well too and in part (c) most were able to find $x = 0.14$. A common incorrect answer for y was 0.39 but students giving this were often able to score the final mark for a correct follow through on z. Parts (d) and (e) were demands couched entirely in context, with no reference to the event letters, and this clearly caused problems for a number of students as incorrect answers of 0.53 for (d) and 0.29 for (e) were quite common. It was slightly surprising that many who could not answer (d) or (e) correctly were able to give a fully correct answer in (f). The most frequent error in (f) was to write 0.21/0.5 and a number of students failed to place the brackets correctly in the expression $A \cap B \cup C$ which, unless their solution went on to imply the correct brackets, meant marks were lost here too.

Question 3

This was the most challenging question on the paper with a mean score of 6 marks and a modal score of zero. In part (a) many could not deal correctly with the minus sign or they started with a probability statement such as P($L < 45$) = 0.6 and then had to "fiddle" the signs to reach the given answer. Signs errors were common in part (b) as well and this usually meant that their equations would be incorrect in part (c). Solving their two linear equations in (c) was usually demonstrated clearly but a large number of students failed to reach the correct values of μ and σ. There were, as usual, few cases of students checking their work for the error upon reaching a negative value of σ. Part (d) was sometimes answered correctly but many students embarked on complex calculations involving the normal distribution and made little headway or obtained answers greater than 1. Part (e) was particularly challenging. Many students, including some of those with correct answers to part (d), were unable to relate these values to this part, nevertheless just over 15% of the students scored full marks on this question.

Question 4

This question was generally answered very well and over 40% of the students scored full marks. Most students were able to form a suitable equation for P(A) and they nearly always arrived at 5/6 for the answer. The tree diagram was then invariably completed correctly but over 20% of students made no progress on this question beyond completing the second column of the tree diagram. A number of students still find conditional probabilities a challenge and some had $\frac{\mathrm{P}(A')}{\mathrm{P}(B')}$ as their expression in part (b).

Question 5

This question was also answered well by most students. A common mistake in parts (a) and (b) was to find the standard deviation rather than the variance but otherwise these were answered well, though some carried out very long calculations to find the variance of y. Part (c) caused problems for many students who couldn't see how to find S_{xy} from the gradient of the given regression line. A few tried to find y values (and therefore Σxy) by generating these from the regression equation; a hopeless and time consuming activity. There were many good responses in part (d) from those who had a suitable value of r. In part (e) most scored the first mark but few paid heed to the units and multiplied by 1000.

Once again it was disappointing to see scripts with negative values for variance or values of r of magnitude greater than 1.

Question 6

There were opportunities for most students to score some marks here though only a handful made significant progress with part (h). It appears that many students were unfamiliar with the uniform distribution and a wide variety of incorrect answers were seen. Most students were able to show clearly how P(X = 3) was obtained from $\frac{1}{4}+\frac{1}{4}\times\frac{1}{4}$ in part (b) and a correct answer to part (c) usually followed. Parts (d) and (e) were usually answered very well but a small minority who insisted on using their incorrect value for P(X = 3) could not reach the correct answers. The remainder of the question proved more challenging. Those who understood what the variable R represented were usually able to write down the correct probability distribution in part (f) and they were often able to go on and answer (g) correctly as well. In part (h) many interpreted "the game is played once" to mean R = 1 only and failed to consider both the required cases. A common incorrect answer was $\frac{5}{16}+\frac{5}{16}+\frac{1}{16}$ from just considering $X >$ 2.5.

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