General Certificate of Secondary Education
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Applications of Mathematics (Pilot)   93701F

(Specification 9370)

Unit A1: Applications of Mathematics
          (Finance and Statistics) - Foundation

Report on the Examination

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Unit 1: Foundation Tier

General

The paper was accessible to the target group and there was no evidence of a lack of time to complete the paper. Working was shown clearly for some questions and was within the working space provided. However, in some of the problem solving questions, answers were given with no working, and so, if incorrect, could not be given any credit.

Topics that were done well included:

- calculating with money or simple quantities
- interpreting a pictogram
- problem solving finding ticket quantities.

Topics which students found challenging included:

- calculating a mean of a frequency distribution
- comparing two distributions
- relative frequency
- algebraic expressions.

Question 1

This question provided a straightforward start to the paper with the majority of students gaining full marks. Part (a) was the best answered as, in part (b), a small number either multiplied 10 by 18 or multiplied all three numbers together. Students usually made progress with part (c), but some made arithmetical errors or did not consider their costs from parts (a) and (b).

Question 2

Part (a) was answered well and in part (b) the majority of students could work out their correct change. However, a large number based their calculations on one carton of juice each instead of two.
In part (c) the majority of successful attempts considered multiples of 1.15 to see that 4×1.15 was the maximum possible. Methods were usually clearly shown so that students could be awarded the Q mark for communication. The most common error was to use the 4 as the amount of apples, giving 23 as the number of bananas needed. It was very rare for anyone to round up 4.34 to 5.

Question 3

Parts (a) and (b)(i) were answered well but a large number of students gave 50 as their answer to (b)(ii) (the percentage who exercised for 30 minutes to 60 minutes a day).

There were a large number of students who compared inconsistent numbers of classes in part (c) because they took the first class on Method 2 to be £5.00 instead of £7.25.

Those who systematically listed prices for each number of classes for both methods were usually successful in reaching the answer 7 and gained all marks as they had shown that 7 classes was £20.75 with Method 2 but £21 with Method 1.

Least successful were those who randomly chose different numbers to compare - the most common being ten classes. These students gained some credit for a comparison of the same number of classes but had not worked out the shortest possible time.

Question 4

There were some correct answers in 4(a)(i) but a large number worked out 15% instead of 85%. Others simply took 15 away from 160000. The follow through marks meant that all students could gain full marks to part (a)(ii) by using their answer to part (a)(i). However, only a small number of students understood what to do, with over half the students failing to show any correct method. The most common error seen was $1000 + 5.33 = 1005.33$.

Although the majority of students could read the graph correctly in part (b), many of them failed to realise that the scale was in thousands of pounds. In part (b)(iii) a large number put April or July without stipulating the year, and, as there was April and July for 2008 as well, they failed to gain any credit.

Part (b)(iv) saw some incorrect readings but the most common error was to work out $182000 - 165000$.

Question 5

The pie chart question saw the usual array of responses. The total frequency of 180 provided for an easy calculation of angles for students who knew what they had to do. As usual though, many students simply tried to measure the frequency values, sometimes labelling the rest of the pie chart 'other'. Those who calculated the correct angles generally measured them accurately, though lack of a ruler did contribute to some angles being out of tolerance. Students need to be encouraged to check that their final angle left is still within tolerance. Part (b) was less well attempted, with students usually scoring full marks or no marks. There was a large number of non-attempts at this part (15%)

Question 6

Many students gained at least one mark in part (a), but errors were made in simplifying; or it was not done at all. The most common incorrect fraction given was $\frac{8}{14}$ from errors in counting the numbers.

Students usually knew that they had to order the numbers to find the median in part (b), but often numbers were omitted leading to incorrect medians quoted. In part (c), the most successful answers came from those students who found the new median but there were some good explanations about the extra value being above the current median. A small number thought it would stay the same as the position of the original median had not moved.

Question 7

This problem solving question was answered very well with a large number of students gaining full marks and very few failing to score at all. The methods seen were often not systematic but the relatively easy numbers helped the students come to the correct conclusion fairly quickly. Questions involving money are usually well attempted.

Question 8

Many students struggled with the expression with $7x$ being frequently seen in part (a) and $x2$ or x^2 in part (b). Very few then went on to use them in part (c), not realising that the introduction of 'x', as the number of miles that Pavel travels, was suggesting that a good approach would be to use algebra. Common causes for loss of marks were to divide 22 by 2 rather than 4, or to use trial and improvement and not reach the final answer. Some students missed Pavel out of their working, and gained 7.33 as their answer. Some students did not read the question carefully and doubled their value for Ruth's journey to obtain Josh's journey.

Question 9

Students at this tier found this question challenging although there were some fully correct solutions. The most common error was to divide 300 by 5 ($= 60$) and 300 by 10 ($= 30$) giving 90 prizes in total. Others divided 300 by 2 so thought there were 150 prizes. Some of these students then went on to find the correct price for their number of prizes, but they were in the minority

Question 10

The students who worked out the correct amount given and needed usually gained the QWC mark for clear method and a correct conclusion. However, the majority of students struggled to work with fractions at all. The most successful methods involved breaking the fruits into sets of quarters/portions either by numbers or diagrams.

Question 11

Less than 1% of the students gave any relative frequencies for this question, all the others simply writing the frequencies and so gaining no credit for just counting the numbers of each. In part (b), the majority thought it was biased but could not give a valid reason for their choice. Some said there were more sixes **and** less fives.

Question 12

Only the best students could make any progress with this question. For the mean, common errors included: working out $\sum f \div 4$ leading to the most common incorrect answer 12.5, using incorrect midpoints (usually class boundaries) or using the class-widths in some way, either dividing the frequency by them or multiplying the frequency by them. Rarely did students understand how to compare the two distributions, although a very small number compared the two averages correctly. The majority just listed some times for the Town while others compared the values (slowest and quickest) just on the alternative route. In part (c), vague phrases such as "use town because its quicker", or "use alternative route because its quicker" were the norm.

Mark Range and Award of Grades

Grade boundaries are available on the Results statistics page of the AQA Website.

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