AQA

General Certificate Secondary of Education
June 2011

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 with no evidence of a lack of time to complete the paper. All questions were attempted. A number of candidates made arithmetical errors, suggesting they either had no calculator, or did not use it. Candidates should be advised to show their working, particularly on questions with 3 or more marks, as incorrect answers with no method seen cannot gain any credit.

The responses of some candidates were difficult to read. This was not always due to poor handwriting but sometimes due to what they were writing with – candidates must be made aware that they should use black pen / biro as other colours and pencils do not scan well and can be very difficult to read.

Topics that were done well included:

- calculating with money
- reading a bar chart

Topics which candidates found challenging included:

- inequalities
- comparison of averages
- simple interest
- ratio

Question 1

Parts (a)(i) and (a)(ii) were answered well by the vast majority of candidates. Those failing to gain full marks in (a)(i) often did not multiply up to find the cost of 3 biscuits and / or the cost of 2 coffees. Some attempted the correct calculation, but failed to do it accurately. Part (a)(ii) was usually correct, or correct on ft. where an error was made in (a)(i). Those who did not find the change correctly were often 10 p or £ 1 away from the answer due to an error in subtraction.

Many good attempts were seen for part (b)(i). Some candidates used the diagram for shading to good effect.   A common error from a small number of candidates was to find $\frac{1}{3}$ of 12 as 3 rather than 4.

Very few candidates attempted to add $\frac{1}{3}$ and $\frac{1}{2}$. Those who did, usually found this method difficult.

Part (b)(ii) proved accessible to the vast majority of candidates. Those who did not gain full marks often gave combinations of 3 or 5 coins totalling 80 p; for example, 50 p, 20 p, 10 p was common for 3 coins. Some instances of non-existent coins were seen, such as 15 p, 30 p and 40 p.

Question 2

Parts (a) and (b) were answered well with the majority of candidates coping with this multi-bar chart.

In part(c), a large number correctly picked out that the reason 'want to spend time with family' had the highest percentage for all three countries, and found various ways to state this. Some commented on actual percentages for the other two reasons, or incorrectly stated that domestic reasons were always lowest (they were the same for Scotland). Others stated that one particular reason such as 'no financial need' was similar.

The majority of candidates could complete the bar chart accurately with a small number making errors in the height of one or more bars, usually plotting 23 at 22. It is important that candidates are aware of the importance of the key in this type of diagram. Those who failed to shade or failed to provide labels were unable to gain full marks.

Question 3

Over half of all candidates could find the mean of the nine numbers. A small number simply gave the total, while others attempted to find the median, and in a small number of cases, the range.

Part (b) showed a variety of responses with the most able candidates knowing that 69 was below the mean, so the mean would decrease. Other able candidates worked out the new mean to show it would decrease. A large number of candidates knew that the mean would decrease, but were unable to provide a correct/valid reason. Common errors included thinking the mean would increase as more weight was being added, others thought it would decrease as the sum would be divided by 10 rather than 9.

Question 4

Many candidates struggled with the use of hours and minutes in part (a). A small number thought that 1pm to 5pm was 5 hours but a lot more thought that 16 minutes was 0.16 hours and calculated $4 \div 0.16$ to gain a fairly common answer of 25. $240 \div 12$ and $240 \div 4$ were often seen together.

Candidates were more successful in part (b), although some did not give units with their answer, or showed working but made an arithmetical error. Many knew to do the correct calculation but found 1.65×8 and gave the answer as 13.20. Others found 8×40 as 320 then added 1.25 to gain the answer of £321.25, without thinking that this was far to expensive for cleaning a house with 8 windows. Lack of working out prevented a small number of candidates from gaining a method mark.

Question 5

This 6 mark multi-step question proved challenging for a large number of candidates. A small number failed to show any working, losing potential method marks. Some attempted to find the total for the 43 hours worked had Faraj been paid £5.78 per hour for all 43. Although this could lead to the correct final answer, it was rare to see candidates who did attempt this method follow it all the way to the correct answer.

Question 6

Working with measures of time proved to be a problem again for many candidates. A small number of those who successfully worked out $9 + 7 - 5$ then failed to give the answer in the correct form or gave it as 11pm. In part (b), a large number of candidates incorrectly divided when they should have multiplied or vice versa. A small number who gave the correct comparable values then chose the most expensive city.

Question 7

Errors in counting led to loss of marks in the tally chart but the majority were successful with choosing the mode. Although many candidates did know what to do for part (b), arithmetical errors in either addition (to get the total) or in the multiplication were often seen. Many candidates did not know what to do and either added the frequencies to get an answer of 15, or added the 'number of cars' from the axis and gave an answer of 60. There were many varied responses for part (c). The better candidates made reference to a change in time to a busier period or to carry out the experiment for longer or more often. Some of these gave two reasons both referring to a change of time. Other correct responses included counting how many people crossed the road.

Over 10% of candidates did not attempt this part of the question.

Question 8

This simple data presentation technique was often not well understood.

There were quite a lot of missing keys and those keys present were not always correct (eg, 1 | 3 represents 4). There were also errors in ordering (particularly the second row), often with a missing value, some with two-digit numbers where single digit leaves should have been, and an unusually large proportion did not attempt the diagram.

In part (b) a large number gave a correct statement indicating that the red bus stop had more people waiting. Many, having found the median and range, did not provide an interpretation, but merely stated that one was greater (or smaller) than the other.

Some found the median of the red buses incorrectly as 5, suggesting their ability to put numbers on to the stem-and-leaf diagram is better than their ability to interpret it.

Candidates do need to understand that the median is a measure of average and the range is a measure of spread. This would help avoid incorrect statements such as "the higher range tells me that there are more people waiting for the red bus".

Again there were a large number of non attempts.

Question 9

Part (a) was answered very well with the majority giving fully correct solutions. Part (b), however, caused problems for the majority of candidates. The most common error was to attempt to work out compound interest, but other errors including multiplication or division by 4 and 3 were also seen.

Question 10

It was clear in this question that those candidates who had been taught this topic generally did well but that there were a large number of candidates who seemed to be totally unfamiliar with spreadsheets. There were some arithmetical errors but generally those who scored marks, scored on all three parts.

Question 11

Part (a) was answered well but in part (b) the majority of candidates gave the incorrect answer of 4. Answers of 5 or 2 were also seen quite regularly. Those attempting to add the correct numbers were usually successful. In part (c), the majority of candidates added the wrong numbers - either they did not understand what was being asked for, or they did not know how to use the two-way table. Those who did find 25 were often unable to convert to a percentage. Candidates need to be aware of the need to show working out, as follow through marks were awarded for a correct conversion of their number to a percentage.

Question 12

Part (a) was not well attempted as the inequality notation appeared to be unknown by many. A small number gave an answer such as 145 cm. Quite a few gained just one mark for part of their double inequality being correct (such as $160 > h < 135$). Others offered answers such as $h = <160 > 135$ and $h = <135 > 160$.

In part (b), the majority attempted a trial and improvement approach and a large number gained some success by giving a set of any three values fitting the age differences. A large number started with 423 – 8, but then usually divided by 2 or 3.

Some managed to get 83 with little or no working, whilst others clearly did quite a lot of work to get there. An algebraic approach was seen very rarely, and seldom led to a completely correct solution.

Question 13

Part (a) proved a very demanding question for the majority of Foundation tier candidates. A small number made a start with the ratio, finding 3 × 5.20 + 3.80, but the majority did not know how to use the ratio. Common errors included taking the same amount of each type, getting to 4 kg correctly, but then adding half a kilogram of each type to get to 5 kg, and changing the ratios to 1.5 : 3.5 so that they totalled 5.

Part (b) saw a large number of good attempts but 4.80 ÷ 0.2 or 4.80 ÷ 20 were frequently seen. Arithmetical errors, or subtracting 96 p instead of adding, also led to a loss of marks.

Mark Range and Award of Grades

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

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