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General Certificate Secondary of 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 and there was no evidence of a lack of time to complete it. A calculator was not used in some questions where it would have been appropriate. Candidates should be reminded of the value in providing working out in order to gain marks for a correct method when the final answer is incorrect.

Topics that were done well included:

- Calculating with money
- Reading pictograms.

Topics which candidates found challenging included:

- Calculating loan payments
- Comparing distributions
- Mean from a frequency distribution and use of mean.

Question 1

The vast majority gave a correct answer to part (a). The few not gaining full marks usually did not add the numbers correctly or chose the wrong numbers.

In part (b) there was some misreading of values from the menu, or of the question, by only costing one toastie and / or coffee.

A small number of candidates found the total cost but did not work out the change. There was evidence here of a lack of a calculator in some cases.

Part (c) had a good response with only arithmetical errors leading to incorrect suggestions.

The correct money notation was usually seen in part (d) with candidates, in the main, choosing to give their answer in pence. There were a small number of answers of 8 p seen.

Question 2

Part (a) was well done. In part (b), there were some answers of 252 seen (from 215 miles + 37 km). Part (c) was usually correct. Common errors were to write × 1.6 or ÷ 6.1.

Question 3

Candidates found most of this question very straightforward. Part (d) proved difficult for some candidates, with 1200 / 42 leading to 28 .(...) ,a common answer. Some worked with 725 without showing where this came from. A small number of candidates divided the wrong way round, eg 42 / 525, or 42 / 1200. Some left 525 as their answer.

Question 4

Only the most able candidates gained full marks on this unstructured question.

Common errors included failure to divide by 100 (either no division or division by 1000) and dividing by 6.5.Some found the difference between the readings and then divided by 6.5

Many added the readings instead of subtracting, either before or after multiplying by 6.5.

A small number used just one of the readings and concluded he had not saved enough.
Those who did gain the correct cost usually concluded correctly.

Question 5

Parts (a) and (c) were answered well. In part (b) common errors included: adding the LH column to gain an answer of 10, adding the RH column to gain an answer of 20, and adding all the numbers in the table to gain an answer of 30. Some candidates omitted one value or had $3 \times 0 = 3$. The answer 17 was seen occasionally, from adding the numbers in the RH column without the '3'.

Some very good bar charts were drawn for part (d). A small number of candidates decided to draw a vertical line graph and some plotted values as for a scatter diagram. Those who drew a bar chart generally managed better than those attempting a vertical line graph. Scales for the 'variable' axis often had the '0' missing. Vertical line graphs were often seen to have the axes the wrong way around, so the lines were generated from the frequency axis. Candidates need to know what type of diagram is appropriate for representing different sets of data, and that scales need to be linear.

Question 6

Although the majority of answers were correct for part (a), common errors included using $3 \times 190 + 250$ or $(250 + 190) \times 3$.

Those not using a calculator sometimes made errors in arithmetic.

There were a large number of good responses from candidates for part (b). The most popular method was, starting with 250, to repeatedly add 190 until 1580 was reached, with the majority of these gaining the correct answer. The remainder usually reached an answer of 7 rather than 8 as they counted the '190's. Some candidates subtracted repeatedly from 1580. Another common approach was to subtract 250 from 1580 to gain 1330, then divide by 190. However, a large number of candidates then forgot to add on the first day so gave an answer of 7 instead of 8. A small number of candidates used 630 from part (a).

In part (c) the majority of candidates correctly read the distance of 66 from the table. Most of the candidates then multiplied 66 by 40 p giving a total cost of £526.40 and concluding Josh was more expensive. It was rare to see multiplication by 6 or 3 or 2 for 3 days or a return journey and very rare to see a fully correct response. Quite a few decided it was appropriate to divide 66, or their distance, by 40 p. Others struggled with the journey there and back and sometimes combined distances from the table in their attempts to find the distance required.

Question 7

In part (a), the majority of candidates compared the number of words each answered correctly and were generally successful. Many correctly compared percentages but some candidates had problems converting from one form to another. Quite a few attempted non-calculator methods to find 80%, these were usually, though not always, successful. Using repeated 10%'s (or 50% then 10%'s) usually worked for candidates whereas using 50% then 25% did not. A small number worked out 40 and did not make a decision.

Some good comments were made by candidates in part (c) using the median values. Some started again and found the mean values; these were usually correct and comparisons made. Some attempted to compare the totals from the two classes, but either ignored the stems or did not acknowledge that there were the same number of students in each class, which was the reason such a comparison is valid in this case. A large number commented on the number of students getting higher scores, or more than 15, in one of the classes.

Question 8

Part (a) proved straightforward for most candidates with only a small number finding £3.51 but then not dividing by 3.

In part (b), there was little strategy shown, but most candidates could give a combination fairly close to £2. Working was usually clear to follow but some candidates did not state whether their choices were for large or small bars.

Question 9

Part (a) was well done by many candidates. Those who did not gain full marks often added 5000 to their answer or subtracted 5000 from their answer. The answer 474 was seen quite frequently from those candidates who had not read the question carefully and just multiplied the payments of £158 by the 3 years, although some of these did realise that £474 was low and added £5000.

Many did not understand what they had to do in part (b) and common incorrect methods involved dividing 1120 or 5000 by 60.

The majority selected a valid reason for their choice of bank in part (c) but there were a small number who thought that Bank A did not charge any interest.

Question 10

This question proved challenging for many candidates. In part (a) a large number could not work out the percentage, with the most common wrong answer seen being 8 (or 8.3, or 8.33) from 775/93. Many subtracted 93 from 775 and used these figures to work out the percentage.

In part (b), the vast majority of incorrect responses involved trying to compare the **number** of people, rather than proportions. Better responses compared the mode, considered proportions or fractions or percentages, sometimes referring to the 12% from part (a) and comparing it with over 25% from the pie chart to offer a comment on difference.

In part (c), there were many good responses commenting on the use of the word 'agree' and that the question is leading. A large number commented on the use of the word 'definitely' associated with the 'yes' response or that a neutral option was missing. Common incorrect responses often referred to not knowing where in town the parking was based, simply stating biased without an explanation, or stating there were not enough options to choose from. A small number of students thought the question in the box required an answer and 'ticked a box'. Some candidates described parking problems.

Question 11

The majority of candidates could use the formula correctly leading to an answer of 4857.14 ..., although some worked out $176\,000 - 142\,000 \div 7$ leading to an answer of 155 714.

A large number of candidates who gained the correct value form the calculator could not then round to the nearest £5 with the most common incorrect response being 4860. Some answers of 485 were seen, showing a misunderstanding of the nearest 5. A small number divided by 2 (2 years given) or 8 (including 2002 and 2009)

Question 12

In part (a), of the relatively small number of students who knew to multiply the mid-class values by the frequencies and add, many did not know to divide by 20. Some used the upper class boundaries but the majority did not consider Σfx at all. The most common incorrect answer was 4 from $20 \div 5$, although some appeared to choose 4 as it was the 'middle' of the frequencies. The majority of candidates could not explain why the mean value was an estimate though some knew it was something to do with not knowing the exact time she irons for. A large number said that it was because it was a decimal or because it may change each week, showing little understanding of the reason for using midpoints in the calculation of the mean. In part (c) many candidates divided 130 by 5 but then gave the answer as 26 weeks. Those who multiplied their mean by £5 were generally then successful in completing the question although some rounded answers down giving insufficient weeks.

Mark Range and Award of Grades

Unit 1: 93701F

Tier	Maximum Mark (Raw)	Maximum Mark (Scaled)	Mean Mark (Scaled)	Standard Deviation (Scaled)
Foundation Tier	80	80	43.8	13.3

For modules which contain only one component, scaled marks are the same as raw marks.

Foundation Tier (814 candidates)

Grade	Max mark	C	D	E	F	G
Scaled Boundary Mark	80	50	41	32	24	16
Uniform Boundary Mark (UMS)	69	60	50	40	30	20

Provisional Statistics for the Award

Not applicable for January 2011

Definitions

Boundary Mark: the minimum (scaled) mark required by a candidate to qualify for a given grade. Although component grade boundaries are provided, these are advisory. Candidates' final grades depend only on their total marks for the subject.

Mean Mark: is the sum of all candidates' marks divided by the number of candidates. In order to compare mean marks for different components, the mean mark (scaled) should be expressed as a percentage of the maximum mark (scaled).

Standard Deviation: a measure of the spread of candidates' marks. In most components, approximately two-thirds of all candidates lie in a range of plus or minus one standard deviation from the mean, and approximately 95% of all candidates lie in a range of plus or minus two standard deviations from the mean. In order to compare the standard deviations for different components, the standard deviation (scaled) should be expressed as a percentage of the maximum mark (scaled).