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General Certificate of Secondary Education
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Mathematics 43652F

(Specification 4365)

Paper 2 (Foundation): Calculator

Report on the Examination

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General

This was the second calculator paper for this specification with a greater proportion of functional, problem solving and applications questions. The paper was accessible to students with no evidence of students being short of time.

Topics that were well done included:

- reading information from tables
- multiples and factors
- symmetry
- solving simple linear equations
- better value
- conversion graphs
- use of a calculator.

Topics which students found difficult included:

- writing formulae in words or using symbols
- comparing percentages
- angle problem
- locating a solution using trial and improvement
- algebraic expressions
- interpreting a mean.

Question 1

This question proved to be a good discriminator. Common errors included working out the perimeter, miscounting squares and not stating the units.

Question 2

Part (a) was generally well answered, although some students rounded to the nearest hundred. In part (b), despite the statement that digits could be repeated, some students omitted 11, 55 and 77 from their list.

Question 3

Parts (a) and (b) were quite well answered, although some students stated the formula for circumference or area of the circle. In part (c) responses were generally poor, with many students either not giving a formula or using their values from parts (a) and (b); for example $5.6 = 2 \times 2.8$

Question 4

This question was very well answered by almost all students. A few stated 150 minutes as equivalent to 1 hour 50 minutes.

Question 5

This question was very well answered.

Question 6

This question was generally very well answered but in part (b) the common error was to take half of the remaining water as 50% of the whole, and then calculate 100% – 50% – 30% to give 20% as their answer.

Question 7

Parts (a) and (b) were generally well answered but in part (c) some students misread the question and gave totals for the two dice that would land on black, for example 2 and 2, or 3 and 3.

Question 8

This question was well answered with students being slightly more successful on part (a) than part (b).

Question 9

Both parts of this question were generally very well answered. In part (b) the most common error was for students to use just one symmetry line.

Question 10

This question was a good discriminator.

The three common errors were answers of $\frac{3}{15}$, $\frac{12}{15}$ and $\frac{3}{12}$ leading to an answer of $\frac{1}{3}$.

Question 11

Responses to this question were poor. The most common error was to state a general formula, for example $A = l \times w$ and $V = l \times w \times h$. Some students just wrote in units for area and volume and many students used numbers instead of letters.

Question 12

Most students correctly ticked at least four of the six statements. Rotational symmetry of order 4 stated as true was the most common error.

Question 13

This question was well answered, with the most common error being to reverse the operation required; for example, in part (c), to give $\frac{7}{3}$ as the answer.

Question 14

Both parts were quite well answered by most of the students, with most correctly measuring 60° for Comedy, although some measurements of 120° were seen. The most common error then was to give 3, 6 and 12 for the three sections instead of 3, 6 and 9. In part (b) many students correctly stated that Romance was 6 films but did not state that this was 3 more than Comedy.

Question 15

Many very good responses were seen to this 'better buy' question. Most students followed the question by working out the cost for 1600 grams in each case. Most of the errors were arithmetic ones.

Question 16

Parts (a) and (b) were very well answered, although many students did not make the connection between the parts. Part (c) was less well answered with errors including incorrect money notation and incorrect rounding.

Question 17

The parts of this question were in order of difficulty and all parts were generally well answered.

Question 18

This question was well answered, with the most common error being to omit shading the bottom left hand square.

Question 19

This was again a generally well answered question but incorrect notation was a common error. For example, in part (a), words, 3 in 8 or the ratio 3 : 8 were often seen. In part (b) a significant number of students gave $\frac{1}{8}$ instead of $\frac{7}{8}$.

Question 20

In part (a) most students gave both correct answers. In part (b) the most common error was to not draw the line through the points. A significant number of students did not realise that the line should be straight and consequently did not go back to correct their error(s) in part (a).

Question 21

A majority of students were successful with this question. The most common error was to work out the total length of all the edges. Others simply found the total length of the visible edges. A small proportion of students worked out the surface area.

Question 22

A majority of students had some success with this question with many giving a completely correct solution. However, many students were reluctant to use formal algebraic methods. The most common successful methods were to use a reverse flow chart, or trial and error. Those who did use a formal algebraic method were more successful if the bracket was expanded first, rather than dividing by 3. Common errors included simplifying $6x + 12$ to 18 or $18x$ or expanding the bracket as $6x + 4$ or $5x + 12$.

Question 23

Responses to this question were mixed. The most popular method was to compare percentages, as directed in the question, but many did this without using a calculator and made arithmetic errors, usually in calculating 18 ÷ 25 × 100. It was very common for students to compare the number of lost marks for each test. Other errors included working out 18% of 25 and 30% of 40 or adding to each mark so that, for example, 30 out of 40 became 90 out of 100 and 18 out of 25 became 93 out of 100.

Question 24

This was a challenging question for almost all students. Many realised that angles B and D were equal but made no further progress. The most common wrong approach was to divide the kite into triangles by drawing in BD, work out the angles in triangle BCD to be 65° and then state that angles B and D were 130° leading to angle A = 50°.

Question 25

Only a very low proportion of students were fully successful on this question. The most common errors were to omit the ½ from the formula or to not round their answer to 1 decimal place. Many students did not show the number they were rounding and simply wrote a 1 decimal place answer.

Question 26

Many students did not attempt this question and responses generally were poor at this tier. Many of the successful students worked out values of $x^3 + 8x$ for $x = 2.2$ and $x = 2.3$ but did not realise this was sufficient to answer the question and continued to attempt to work out the solution to greater accuracy. A common error was to mix up the 2.2 and 2.3, working out $2.2^3 + 8 \times 2.3$.

Question 27

Both parts of this question were generally poorly answered. In part (a) common errors were to work out 4 × 2.5, 2.5 ÷ 4 or to work out the average mean for all four weeks. A small proportion of students converted the times to minutes which often led to 150 ÷ 4. In part (b) many students gave week 3 as their answer because this was the longest time spent fishing or because more fish were caught that week. Other students gave week 2 as it had the highest mean and a few gave a week that was not in the table, usually week 5 or week 6. Students struggled to distinguish between mean weight and total weight in their answers.

Question 28

Some good responses were seen but these were in the minority. Common errors included multiplying the two given lengths together, working out the area of the triangle or adding the two given lengths together.

Question 29

This was the least attempted question on the paper and very few correct responses were seen. The most common error was to substitute a value in for x and work out the numerical mean. Many errors were also seen in attempting to add the three algebraic expressions together.

Question 30

Part (a) of this question was very well answered. In part (b) the question was attempting to assess students' understanding of 'fairness', and many were able to relate this to part (a), making a valid statement. Sometimes the reason given did not support the conclusion, for example 'it lands on 3 a lot more than the other numbers so it is fair'.

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