AQA

General Certificate of Secondary Education
March 2012

Mathematics **43602F**

(Specification 4360)

Unit 2: Number and Algebra (Foundation)

Report on the Examination

General

The majority of students attempted all questions. There were many good responses to some of the more challenging questions. However, algebraic questions were again generally not well answered with students showing little knowledge of how to solve linear equations or change the subject of a formula. As in previous papers, the standard of basic arithmetic was often very poor, particularly multiplication and division. In some of the longer and more complex questions, students were often able to apply correct methods, but gave incorrect answers because they did not carry out the basic four rules of number accurately. The problem solving type questions were usually answered by trial and improvement methods. Questions that involved functional elements of mathematics were usually better answered.

Topics that were well done included:
- multiples and factors of numbers
- simple money problems
- sequences
- coordinates in the first quadrant.

Topics which students found difficult included:
- problems involving fractions or decimals
- numbers written to a power of 10
- solving linear equations
- changing the subject of a formula
- drawing a linear graph from a given equation.

Question 1

This question was well answered by the majority of students. The most common error in part (a) was to reverse the coordinates. In part (b) the majority plotted B correctly at (8, 1). In part (c) most students were successful but quite a number were unable to plot or find the midpoint with A given and B plotted correctly. A small number of students wrote one of the coordinates correctly. A common incorrect answer was (8, 5).

Question 2

The majority of students gave the correct two multiples in part (a). Fewer students gave the two correct factors in part (b). Most students gave at least one correct square number in part (c), with 27 or 32 being the most common incorrect answers.

Question 3

This question was well answered by most students. The traditional method of setting out was the most common method employed and the one which generated most success. A few students simply subtracted the smaller digit from the larger in the hundreds and units columns to arrive at an incorrect answer of 202. Other common incorrect answers were 108 and 197. Quite a number of students checked their answer by working out 198 + 123.

Question 4

This question was answered quite well by most students. The majority understood what was required, although a few only added 1 adult price to 1 child price. The most common error was careless arithmetic such as £9.25 + £9.25 = £16.50. There were also many instances of students miscopying the figures in the question.

Question 5

Many students appeared to struggle with this question because they were unable to find a strategy to use. There was much success for those students who began with 200 – 30 = 170, followed by 170 ÷ 2 = 85 in order to find one of the numbers. However, many students used a trial and error approach, which often resulted in confused workings and generally ended with answers which satisfied only one of the two conditions. A very common incorrect answer was 130 and 70.

Question 6

The majority of students were able to write down the rule in part (a), although some students had difficulty expressing their answer concisely. $n + 6$ and $6n + 2$ appeared quite often and were acceptable answers. However, a significant number of students just wrote down the number 6 without explaining how to use it. Almost all students were able to give the next two terms in part (b). Quite a number of students wrote 38 and 44 in the spaces left in the stem of the question and then gave 50 and 56 on the answer line, but there was no penalty for this slight misunderstanding. Most students were able to apply the rule used in part (a) to successfully find 290 in part (c). Poor arithmetic was the main cause of errors in this part. 190 and 296 were common incorrect answers.

Question 7

This question was generally well answered. Quite common errors were to include only one pen in the total instead of three or to stop at the total price and not work out the change.
Examples of common errors with the arithmetic included 27p × 3 = 72p, £5.99 + £1.80 = £6.79 and £10 – £8.60 = £2.60

Question 8

There was widespread misuse of terminology throughout this question. Square root was often confused with square and factor with multiple. Some students knew which one was the odd one out, but could not express the reason adequately. A few simply gave the highest or the lowest value as the odd one out in all parts. In part (a) many students identified 7.5 as being the odd one out, but some gave $\frac{3}{4}$ as it was the only fraction or because the digits 7 and 5 were not being used. A few students thought the first three were $\frac{1}{4}$ or $\frac{1}{3}$. In part (b), a good number of students stated that three of the fractions cancelled to $\frac{1}{3}$, but some stated that they were equal to 3. Part (c) proved more difficult and 'this isn't a square root' was a common incorrect answer. Some students referred to multiples while others confused the square root sign as a division. Many students identified 15 in part (d), although some thought this was a sequence and hence were unable to give a correct reason.

Question 9

The answers to this question were varied with some students unable to process the question. Some students produced concise working and an accurate answer in just a few lines. A number did not state a conclusion. Some good answers were produced in tabular form, building up to 16 pancakes. A common error occurred where students doubled the number of pancakes for each $\frac{1}{4}$ litre and then gave an answer of 'Yes, she has enough to make 32 pancakes'.

Question 10

Although nearly half of the students gave fully correct answers, many struggled with the negative values in this question. A number of students combined the cards in such a way that two pairs gave the same total but one total was different. A common incorrect answer was to have the 2 and –2 the wrong way round ie –7 and –2, –5 and 0, –3 and 2.

Question 11

A high proportion of students obtained the correct answer in part (a). A common error was to attempt to work out $8 \div 3$ which often led to an answer of 2.2. Part (b) was also quite successful. A frequent error was to attempt to simplify $7c + 3d$ which was then usually given as $10cd$. There was less success in part (c). A few of the common errors were: $12 + -10 = -22$, $5 \times -2 = 10$, $3 + 4 + 5 - 2 = 10$ and $34 - 52 = -18$. It was also fairly common to see answers left as $12 - 10$ or $12 + -10$.

Question 12

This proved to be a difficult question for most students. Various methods were employed but the most common was to attempt to convert $\frac{3}{8}$ to a decimal. However, in attempting this $8 \div 3$ was often seen. When converting to a percentage, some students went from $\frac{3}{8}$ to $3 \times 8 = 24\%$ or even 38%. The few students who attempted to convert both numbers to fractions were usually unsuccessful because they did not convert both numbers to a form with a common denominator. A significant minority of students simply wrote down an answer with no working and a few attempted unconvincing explanations by drawing diagrams.

Question 13

Part (a) was not well answered. Many students simply wrote 100 000 as the answer. The most common incorrect answers were $100\,000^{10}$ or 10^{10}. Part (b) was also not well answered. The most common error was to evaluate 2^3 as 6 and 5^2 as 10. Another common error was to add 8 to 25 leading to an incorrect answer of 3.3

Question 14

Only the more able students coped well with this question and obtained the final answer of 24. The working for the majority of solutions was unclear. Some students gave 6×3 or 18 or $\frac{1}{4} = 6$ or $\frac{1}{3} = 6$ somewhere in their working but made no further progress. A significant number of students obtained 24 but then went on to use 24 in further calculations without realising that 24 was the final answer. Common errors were to start by finding a quarter of 6 or two-thirds of 6.

Question 15

About a quarter of the students circled the correct formula in part (a). In part (b) there were very few correct lines with only a few cases of students calculating points to plot. Many students simply plotted a point at (8, 30). Others drew incorrect lines from (0, 0) to (8, 30) or from (0, 30) to (8, 0) or from (0, 30) and parallel to the given line. Part (c) was also not well answered. Many students gave an answer without any reason or without any supporting evidence. Those who tried to calculate prices usually made at least one arithmetic error.

Question 16

A few students attempted an algebraic rearrangement of the equation in part (a) and, of those that did so correctly, many could not progress beyond 12 – x = 15. Common incorrect answers were 3, 4, 7 and 27. Some students attempted to use a flow chart method but could not set up the flow chart correctly nor do the correct calculations with the reverse operations. In part (b) many students simply swopped the letters s and t, so that $t = 3s + 4$ was a very common incorrect answer. Some students substituted various values for s and t to obtain a numerical answer.

Question 17

This question challenged the majority of students. It involved a range of skills: interpreting the question, carrying out the required calculations and understanding how to process the required profit. Very few students were able to produce a logical solution. In most cases progress was restricted due to poor arithmetic. A good number of students were able to carry out one of the multiplications, and some were also then able to carry out a second multiplication but few progressed beyond this point.

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