



**General Certificate of Secondary Education
November 2012**

Mathematics

43602H

(Specification 4360)

Unit 2: Number and Algebra (Higher)

Report on the Examination

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General

Students performed well across a wide range of questions. There was an improvement in presentation with working out often seen, where appropriate, instead of just giving answers only. Some poor arithmetic was seen.

Topics that were well done included:

- basic algebra
- best buy problem
- using fractions and ratio in a problem
- writing standard form as an ordinary number.

Topics which students found difficult included:

- simplifying an algebraic quotient
- shading an appropriate region using inequalities
- working with indices in a real life problem
- factorising the difference of two squares
- algebraic reasoning (explaining why an expression is always positive).

Question 1

Both parts provided an excellent start to the paper for most students.

Question 2

This was generally well answered. The common mistake was to halve £600 and then add or subtract £50. Few algebraic solutions were seen but those who did use algebra were nearly always successful.

Question 3

There were excellent responses to this question with the majority well set out. The value that was most often incorrect was that for 'New Homes', where 30% was incorrectly used for one-third. There were many arithmetical errors with, in particular, $250 - 75$ and $240 \div 3$ often being incorrectly evaluated.

Question 4

This question was well answered. Some students repeated the $39 = 3 \times 13$ from the question and common arithmetical errors were seen. Others used 1 as a prime number or went beyond numbers in the 30s.

Question 5

Many students drew the graph correctly, although some did not use the full domain 0 to 5.

Question 6

Both parts were well answered. In part (a) some students were unable to evaluate 11 squared divided by 2 correctly. In part (b) a significant number of students gave the n th term as $n + 3$.

Question 7

There were some well-presented solutions to this question and some efficient ones; for example, just comparing the total of females to half of 460. Some students did not know how to proceed with the information given as a ratio; but others handled the fractions well and were able to combine their values for an overall total. A number of students added numbers from mixed genders.

Question 8

Whilst there were a number of elegant algebraic solutions, the majority used a trial and improvement method to attempt to solve this problem. Many seemed unsure about how to test the ‘three times’ element or were doing it in their heads. Those who did use algebra usually had more success.

Question 9

This question led to a wide variety of responses with only about half of them correct. There were many possible methods but the most common was to turn the mixed number to an improper fraction as a first step. Some students partially converted the mixed number to enable the subtraction to be made easier.

Question 10

Part (a) was quite well answered, although a common incorrect method was to multiply the powers. There were more problems in part (b). Many gave 2 instead of $\frac{1}{2}$ and others were unable to deal with d^0 .

Question 11

Many students found this standard question challenging. A significant proportion drew $y = 3$ instead of $x = 3$. It was common for an incorrect region to be labelled even when all the lines were correct.

Question 12

Parts (a) and (b) were quite well answered. In part (c) many students did not realise the connection between 4^3 and 2^{10} and were unable to progress with the question. The more successful outcomes were when students ‘doubled’ several times and then counted the number of days this equated to.

Question 13

The expansion in part (a) was quite well answered although there were errors when collecting terms. Part (b) was poorly answered with very few fully correct answers. Most students only took out the factor 3.

Question 14

Many students multiplied through by the denominator of y from the left hand side correctly. Errors then arose when attempting to collect terms. Very few students successfully re-factorised and rearranged.

Question 15

Part (a) was well answered although the incorrect answer of 25 was common. Part (b) was less well answered. Many simply divided by 3 as a first step.

Question 16

There were many good attempts at this ‘completing the square’ question. Part (a) assessed Quality of Written Communication and many were unable to complete the algebraic reasoning with sufficient rigour. In part (b), only a few were able to explain that the squared bracket would always be positive or zero and that adding a positive number to it would keep it positive. A large number of students discussed the unrelated issue of odd and even situations.

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