RECOGNISING ACHIEVEMENT

GCSE

# Mathematics A

General Certificate of Secondary Education **J562**

# Examiner's Report

## November 2010

**J562/R/10N**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this report.



Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

**CONTENTS**

**GCSE Mathematics A (J562)**

**EXAMINER'S REPORT**


| **Content** | **Page** |
|---|---|
| A501/01 Mathematics Unit A (Foundation Tier) | 1 |
| A501/02 Mathematics Unit A (Higher Tier) | 3 |

# A501/01 Mathematics Unit A (Foundation Tier)

**General Comments**

There was a wide range of abilities shown by candidates. Most candidates had been entered at the appropriate level; however, a small number might have been better entered at Higher tier.

Many candidates displayed satisfactory ability at using calculators, but algebra proved more demanding. Problem-solving questions were well attempted by many candidates.

One problem was the quality of candidates' handwriting and quite often it was difficult to read what was written. Another problem was the failure of candidates to clearly delete work when making a new attempt. Both of these issues need to be addressed.

A number of candidates failed to attempt the last two questions.

**Comments on Individual Questions**

1 There were many fully correct answers to this question. However, part (d) was less well answered than the other three parts. Some candidates gave answers in words and were invariably wrong.

2 This was the best answered question on the paper with many fully correct solutions.

3 There were some unusual answers offered in part (a) with the lengths of both tables and babies being measured in kilograms. Many solutions to part (b) suggested that candidates did not understand the question, or at least did not read it sufficiently carefully. Some candidates appeared not to realise the significance of "**in the carton**". A common error was to state that the amount of juice **in the jug** was not enough to fill two glasses. Misreading the scale on the jug was also common, as was not knowing that 1 litre = 1000 ml.

4 This was a well answered question with most candidates scoring marks in parts (a), (b) and (d). A very common error in part (c) was an answer of 8. The usual mistake in (e) was simply to repeat the question and say every extra metre contained 3 plants.

5 Both sections in part (a) were almost always correct. The only errors to occur here were to have uneven gaps between the bars or uneven bar widths. Common errors in part (b) were to confuse mean and median, and even mean and range. Part (c) was hardly ever correct. Invariably, answers involved making a statement which used the numbers given and those found, such as one mean was 39 and the other was 30, without any comment about what this meant.

6 There were many good answers to parts (a) and (b) but somewhat fewer to part (c). In part (a), even numbers were given as the answer surprisingly often.

7 Poor drawing skills were frequently demonstrated, together with an inability to use a protractor correctly. It was not unusual to see the "67 degree" angle as greater than 90° or smaller than 45°.

8 Most candidates failed to take account of the weights of 1.4 kg and 1.2 kg. The usual error was to simply add 85p, £1.25 and £6.99.

9 Part (a) was reasonably well done, but parts (b) and (c) were successively worse. Part (c) was rarely correct, with the common error being to bracket all of the $2 \times 4^2$ term.

10 The majority of candidates scored well here. The last card on the left was often wrongly connected to $3a + 2$. It was not uncommon to see more than one arrow coming from each card on the left.

11 Some candidates appeared to be unfamiliar with stem and leaf diagrams. Some were unable to interpret the numbers, with a variety of wrong answers given e.g. the eldest teacher was 29. In part (a)(ii) the idea of median being the middle value was understood but not correctly applied to the diagram. Part (b) was generally completed correctly.

12 This is where many candidates started to struggle, with well over half of the candidates failing to score any marks at all. The correct answer in part (a)(i) was rarely seen. The common wrong answers were 53° and 54°, with some even giving lengths as their answer. In part (a)(ii) the idea was understood but not correctly applied to the diagram. Only the most able candidates attempted, or were successful in, part (b). Some clearly did not understand the question and although attempts using Pythagoras' theorem were seen, many were incorrectly applied. Few candidates mentioned anything about "accuracy" in their comment.

13 In this question the fact that *x* appeared on both sides of the equation proved to be a stumbling block for many candidates. The vast majority had no idea of where to start. Most of those who made an attempt had an algebraic expression as their answer. The few who did score any marks usually managed to isolate 8 correctly.

# A501/02 Mathematics Unit A (Higher Tier)

### General Comments

There was a wide range of responses from candidates, with the marks gained being between 2 and 58 out of 60. There was no evidence of shortage of time, with weaker candidates sensibly having a go at all questions. Topics where some candidates were unfamiliar with the work included identities, cumulative frequency and histograms, and rearranging a formula where the subject appears more than once.

With the new specification, there is a need for candidates to show their methods clearly and nearly all of those entered did this. In meeting the demands for functionality, there were several questions requiring comments on this paper; some candidates found the interpretation of their results difficult, although many produced very sensible responses. Centres need not assume that there will always be this amount of comment required, but functionality and Assessment Objective 3 will be tested in various topics and in a variety of ways.

### Comments on Individual Questions

1 Candidates nearly all knew what to do with this question on ratios and most gained full marks.
In part (a) there were very few arithmetical errors in simplifying the ratios.
In part (b) some of the weaker candidates were unsure about the strategy and divided 140 by 3 and by 4, instead of by 7, or used trials such as repeated doubling of the given ratio, trying to reach a total of 140.

2 Most candidates were successful in finding the prime factors of 75, although not all expressed 75 as a product of its prime factors as requested.
The interpretation needed in part (b) made this more difficult. Many of the candidates tried to work with factors – producing factor trees along with Venn diagrams – but in many of these cases they used their work to determine the HCF rather than the LCM. The candidates who worked with lists of multiples of 75 and 120 avoided this pitfall and were generally more successful in arriving at a common multiple. Other candidates tried to write down successive times, working with hours, minutes and seconds which introduced extra and unnecessary complications, often leading to errors. Another response often seen was to simply find the product of 75 and 120.

3 Most candidates found the terms of the sequence correctly, although a small number of candidates clearly had no idea what to do with '$n$'.
In part (b) the majority of candidates arrived at an expression involving $5n$, with most completing the formula correctly; a few candidates muddled up the role of the 5 and the 2.

4 Where candidates had a pair of compasses and a ruler they usually demonstrated that they understood how to construct the perpendicular bisectors. A small number of candidates bisected the angles whilst others just made a guess.
In part (b) a large number of candidates failed to realise that all of the points A, B and C were the same distance from P and made statements that implied otherwise. Many others made reference to the quadrilateral not being regular or compared the distance of point P from one or more of the sides. Some candidates omitted this part.

5 This question on the order of operations produced a variety of responses.
Most candidates correctly answered part (a).
Part (b) was fairly well answered, with 6 + (2 × 4) – 1 being the most common wrong answer seen.
Part (c) was less well answered, with the incorrect answer of $6 + (2 \times 4^2)$ frequently seen.
Many candidates, throughout the working space in this whole question, just tried out different possibilities. This led them to write down the answer afresh rather than simply inserting brackets into the printed calculation, as required. As a consequence, a number of candidates lost the mark by changing the order of the operations, such as 4 ( 6 + 2 ). Some candidates omitted part (b) or part (c) or both.

6 Many candidates correctly gave 'formula' but few seemed familiar with 'identity'.

7 Measuring the bearing was not done well in the first part, with few candidates knowing which angle to measure and answers such as 053 instead of 223 were common. A small number of candidates looked at the scale and gave an answer of 25 000.
Methods of approach varied quite a lot in part (a)(ii) once the sides had been measured. The majority of candidates managed to score for measuring and adding (either to 28 or to 700 000) but the conversion from centimetres to kilometres was either not attempted or not done correctly by many. Some candidates omitted this question.
In part (b) most candidates made some sort of attempt at Pythagoras and many were successful; a few candidates failed to find the square root. Some used the given value of 1.5 to work back to the length of a side, but then forgot that they needed to find the square root. It was not always possible to be sure that the candidates were comparing their answer with the appropriate length in the diagram.
In part (c) the majority of candidates found the base angle of the given triangle using the tangent function, though some were unable to use the inverse function correctly. There were many other ways of making the requested comparison, such as comparing tan 40° with the ratio of the two sides, or using 40° and one of the given lengths to determine the other. All of these were seen on occasion. A few candidates showed no evidence of knowledge of trigonometry.

8 There were a few candidates who clearly could not cope with the algebra here, though most candidates had a go at the easier parts.
In solving the linear equation in part (a)(i), many candidates knew what to do but errors in the operations used were common. The most common error was in reaching $x = 8$ instead of $5x = 8$.
Most candidates seemed to solve the equation in part (a)(ii) by inspection. It was often done correctly but wrong answers of 2 or 16 were quite common.
In part (a)(iii) a good number of candidates reached $x^2 = 25$. However, a significant number of candidates square rooted before dividing by 3 and hence did not score. The full answer of ±5 was rarely seen.
A surprising number of errors were made in part (b), leading to only one or other of the terms being correct. There was evidence that some of the candidates may have interpreted the question as meaning 4 times $(2x – 7)$.
The straightforward factorisation in part (c) was not done very well. Many candidates did not understand what was required. A common wrong answer was $14x$.
As intended, part (d) was of high demand. Those candidates who managed to reach $x – bx = 2a – 3$ rarely realised that they had to factorise in order to isolate the $x$ term and often simply divided the right-hand expression by $b$.

9 Many candidates understood that they needed to use the cumulative frequency graph to help them construct the box plot in part (a), but did not always read off the quartiles correctly. The diagrams of some weaker candidates seemed to bear no relation to the graph.
In part (b) many candidates thought that the older women were slower but did not provide any data to support their comment, or did not state/imply 'on average'. Many candidates simply quoted values for the medians and/or interquartile range without giving any interpretation. Some said '.... faster' then referred to a range. Many referred to 'spread' without being specific. It was rare to see a completely correct answer in this part.

10 The majority of candidates managed to define the intervals correctly, with many of those also able to determine the frequencies. However, most got no further and tried to draw a conclusion from here. Many good candidates went on to complete the calculation successfully, though some seemed to go back to the frequency densities. Candidates who made an error in the frequencies rarely checked their total against the total of 100 given in the question.
Part (b) was very poorly answered. Some candidates did have the idea that, as the data had been grouped, they were only estimating the mean but did not apply that knowledge to the particular context they had been given. The most common answers gave reference to the fact that some of the bulbs might have faults, might not have been switched on as long, or lasted less than 400 hours.

**OCR (Oxford Cambridge and RSA Examinations)**
**1 Hills Road**
**Cambridge**
**CB1 2EU**

**OCR Customer Contact Centre**

**14 – 19 Qualifications (General)**
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

**www.ocr.org.uk**

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

**Oxford Cambridge and RSA Examinations**
**is a Company Limited by Guarantee**
**Registered in England**
**Registered Office; 1 Hills Road, Cambridge, CB1 2EU**
**Registered Company Number: 3484466**
**OCR is an exempt Charity**

**OCR (Oxford Cambridge and RSA Examinations)**
**Head office**
**Telephone: 01223 552552**
**Facsimile: 01223 552553**