OCR
Oxford Cambridge and RSA

GCSE

Mathematics A

General Certificate of Secondary Education **J562**

OCR Report to Centres November 2015

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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.

CONTENTS

General Certificate of Secondary Education

Mathematics A (J562)

OCR REPORT TO CENTRES

Content	**Page**
A501/01 Mathematics Unit A (Foundation Tier)	3
A501/02 Mathematics Unit A (Higher Tier)	5
A502/01 Mathematics Unit B (Foundation Tier)	7
A502/02 Mathematics Unit B (Higher Tier)	10
A503/01 Mathematics Unit C (Foundation Tier)	12
A503/02 Mathematics Unit C (Higher Tier)	16

A501/01 Mathematics Unit A (Foundation Tier)

General Comments:

The entry for this session was very low with just over 200 scripts marked.

Marks ranged from 6 to 51 out of 60, while the mean mark for this session has only been exceeded in two of the previous presentations of this paper, suggesting that the paper was appropriate for the candidates intended.

Unlike in summer of this year, it is pleasing to report that there were no completely blank scripts where candidates wrote absolutely nothing on the paper. There were also very few scripts that were difficult to read.

Comments on Individual Questions:

Question No.

1 A good start was made by most candidates here with many scoring full marks. Many of the “half cups” in part (c) did not look like that for tea, but it was the intent that was marked here.

2. Many candidates again scored full marks for this question. It was only identifying the prime number (17) in part (d) that proved a little difficult. As is often the case with questions like this, some candidates chose numbers that were not in the given list.

3. The majority of candidates scored well in this question, with part (c) being the most fruitful. In part (a), it was common to see the food store in the middle of Madrid Road rather than at the side of the road. Common wrong responses in part (b) were Agraria Road and even the A31.

4. This was the first question to really test candidates. While most managed to get part (a)(i) correct, the other two sub-parts of (a) were more testing. Part (a)(iii) was particularly poorly done, with incorrect answers of 4.6 and –3 very common.

   In part (b)(i), many candidates read off the scale correctly and succeeded in then calculating the amount of milk used. Part (b)(ii) was pleasingly well done by most.

5. The first two parts involved measuring an angle and a line. The angle was less successfully measured than the line by the weaker candidates. The right angle in part (c) was correctly identified by most.

6. This question involved three stages. Most candidates were able to correctly find the number of years, and most that did were also multiplying that by the yearly increase in the length of the stalactite. However, the conversion from millimetres to metres and then adding to the original length was beyond the vast majority of candidates.

7. In part (a), finding the mean proved to be straightforward for almost all candidates. However, finding the median in part (b) was much more awkward. Many candidates scored one mark for identifying 9 or 10, but the correct median of 9.5 was seen much less frequently.

8. Algebra has always proved to be a problem area for foundation level candidates, but many managed to score at least some marks in this question. Most scored at least one mark in part (a) for getting the 6*f* term. However, the –2*g* term was harder to obtain.

   Part (b)(i) was the most difficult, with answers of 200 from doing the multiplication before the power often seen.

   Parts (b)(ii) and (c) discriminated well between the stronger and weaker candidates. It is pleasing to see that embedded solutions to the equation are becoming less common.

9. Part (a)(i) was a more lucrative source of marks than either (a)(ii) or (b). Most candidates that scored marks in part (a)(ii) did so by finding the terms either side of 600 000. Some made the valid observation that from the fourth term onwards all terms ended with the digits 250.

   Part (b) proved to be much more difficult. The most common incorrect answer came where it was clear that candidates understood how to find one term from the previous term, but not how to go straight to the *n*th term.

10. The scale diagram in part (a) usually generated at least one mark although full marks were not very common. However, finding the bearing in part (b) proved one of the most difficult questions on the paper with very few correct attempts. Most candidates did not seem to understand which angle was required.

11. Although this question was common with the higher level paper, foundation candidates found it quite easy with many scoring all three marks.

12. This was another common question but proved to be less fruitful for foundation level candidates. Although part (a)(i) was often answered correctly, in both parts (a)(ii) and (b) a variety of incorrect approaches were seen. In part (b) a common error was to just add the 20 and 16 to produce an answer of 1.36. A fair number of candidates earned the M1 for counting on from 1 p.m. showing times of 1.20, 1.40, 2.00 and 1.16, 1.32, 1.48.

13. This common question was a step too far for many foundation candidates. Correct answers to either part were rare. Many candidates apparently did not notice (or chose to ignore) the phrase “without doing the calculation” in the question.

A501/02 Mathematics Unit A (Higher Tier)

General Comments:

Most of the candidates retaking this November were aiming for grades higher than C and so on this first unit some very good work was seen.

The topics found most difficult were trigonometry with a bearing; interpreting and comparing a cumulative frequency diagram and box plot; changing the subject of a formula where the subject appears twice, and functions.

Comments on Individual Questions:

Question No. 1

Nearly all candidates completed the two-way table correctly. They found calculating with time more difficult, with most converting minutes to hours correctly, but errors appearing in coping with the seconds. For instance the answer 2hours 7minutes 62 seconds was seen from several candidates.

Question No. 2

Not all candidates coped correctly with the calculation in the first part. Inserting brackets in part (b) was done well.

Question No. 3

Most candidates coped competently with the ratios, although there was some confusion in part (a)(ii). The correct time was obtained by a variety of strategies in part (b), with all the methods in the mark scheme being used.

Question No. 4

Plotting point D was done correctly by nearly all candidates, but several made errors in finding the midpoint of BC. Some omitted part (c), but quite a few candidates used the strategy of drawing a circle of radius 5 cm, centre A, and then found a correct point. Some candidates omitted to draw the angle bisector in the last part; and good constructions were seen from some candidates, but others wrongly assumed that A and C were the same distance from B or drew a line bisector instead of an angle bisector.

Question No. 5

The linear equation in part (a) was usually solved correctly. Most correctly found the nth term of the sequence in the second part.

Question No. 6

Most candidates were able to give correct reasons as to why the answers to the calculations were wrong.

Question No. 7

As expected, omitting the negative solution in the first part was common. In the second part, there were some excellent clear and concise solutions in rearranging the formula but many did not know how to begin, or having rearranged correctly to get the *a* terms on one side and the non-*a* terms on the other, did not realise that next they needed to factorise.

Question No. 8

Many correctly found the cumulative frequencies and constructed the diagram, although some did not join the points, and a few drew a frequency diagram instead. As expected, candidates found the comparisons in the second part much more difficult, with frequent errors in reading off, or knowing what measures to use, or the use of vague statements that did not incorporate enough numerical evidence.

Question No. 9

As expected, better trigonometry was seen in part (a) of this question than part (c), where the complication of the bearing and the angle needed not being identified on the diagram meant that many gained only part marks or zero in part (c); some did not always make it clear which angle they were finding there. Most candidates realised that they could use Pythagoras' Theorem in the part (b) and then add on 180 and many did so competently, with some successfully using trigonometry instead.

Question No. 10

Some candidates only attempted 2-D Pythagoras, but the majority knew what to do and found the length of the diagonal correctly.

Question No. 11

Several correct answers were seen. Some worked out $5(3x - 1) + 2$ instead of the correct $3(5x + 2) - 1$. A few who did not know what to do tried equating $5x + 2$ and $3x - 1$.

Question No. 12

Some candidates substituted $x = 5$ as their first step, whilst others simplified the left-hand-side to $2x - 11$, with some attempting this but making errors. Of those who reached $5c + d = -1$, several went on to give a correct solution.

A502/01 Mathematics Unit B (Foundation Tier)

General Comments

Candidates answered straightforward questions successfully with performance on money, reflection symmetry and use of terms like “square” and “square root” being well answered. However, the number of errors in basic calculations, often in subtraction, was disappointing.

Geometry was a very weak area and candidates were not able to use geometric language or facts accurately to present an argument. They were not able to recognise that the sum of the exterior angles of a polygon = 360^o in the context of a problem.

Candidates should be encouraged to plot and draw accurately, placing crosses carefully on a grid or positioning a ruler so that lines begin and end at the places intended.
Candidates should also practise answering questions in which a chain of logic is presented, communicating this to others and using technical terms correctly.

Comments on Individual Questions

1a Most candidates responded correctly.

1b A significant number of correct responses were seen but some candidates were unable to subtract accurately.

1c Many answered correctly and most candidates displayed the correct method, but errors in subtraction again caused accuracy problems.

1d Lack of accuracy using subtraction again caused difficulties. Many candidates used a correct method and most showed working.

2a(i) Many, but not all, knew that one angle was 90^o. However, the remaining angle was rarely 45^o so the mark was lost. It appeared that, despite the legend "Not to scale", many had attempted to measure the angles.

2a(ii) Isosceles was probably selected by about one third of the candidates.

2b This was the first of the QWC questions. Responses were not good and very few candidates had any notion of giving an argument for why the shape was a square. Many picked up 2 marks for saying that the sides were all equal and that the angles were all 90^o, although they could not say why. Many used inaccurate language such as “The sides are all even.” Others described turning the shape and “...you can see it is a square”.

2c $\frac{1}{2}$ or some version of it was often seen. A common wrong answer was $\frac{4}{5}$.

2d 12 was rarely seen. A few candidates subtracted 30 from 360 and then did 330 ÷ 30 to get an answer of 11. 1 mark was awarded. Most candidates just drew other lines to complete the shape with the usual wrong answer of 6. Some said, “A polygon has 6 sides”.

3a This was usually correct with very few reversed coordinates.

3b This was also often correct.

3c This was often correct although a number of parallelograms were seen on diagram.

4a Many correct responses were seen. Some candidates' completed squares gave symmetry to just part of the diagram.

4b Candidates found this much more difficult than (a). Wrong answers often had line symmetry.

4c A pleasing number of responses were seen though many candidates chose a point on one of the shapes for their answer. It appeared that few used tracing paper to check their answer.

5a Most answered correctly though a few wrong answers of 5×5 or 5^2 were seen.

5b This was also well answered with common errors being $9\times9 = 81$ or $\sqrt{81}$ or 40.5.

5c Again, many correct answers were seen.

5d Few answers of 3^2 were seen. 9 was sometimes given. $\frac{3^4}{3^2}$ was commonly seen. Those few who tried to evaluate often made numerical errors. 6^5 and other powers of various bases were also seen.

6a(i) "An expression" was probably chosen more often than "an equation" or "a formula"

6a(ii) This was answered fairly well but the most usual error was 12.5 cm. Some candidates gave 200 cm from 50×4 and there were other, apparently random, wrong answers.

6b(i) This was not well answered. A common wrong answer was 5, presumably from looking for an integer to fit the inequality. Other common wrong answers were $x = 4$ and 4.

6b(ii) This was also poorly answered. A mark was given when a candidate had given $x = 4$ and $x = 5$ in (i) and (ii) respectively but even this was rarely seen.

7a Plotting was generally quite good. Candidates should be encouraged to use a sharp pencil and plot crosses accurately. Often crosses appeared to have "slapped" onto the page.

7b Candidates usually responded by choosing "Week 1", not looking for the line that showed the greatest drop. Week 9 was another popular wrong answer.

7c This was well answered. A few candidates gave wildly incorrect answers such as 150 but most used their plots and extended the line sensibly.

8a A few candidates gave the correct "Pay in £" or some variant of this. A few gave "Pay in pence" and many just gave "Pay" or "Money". Some said "Number of weeks".

8b 560 was generally the answer given to earn the mark. 540, 580, 600 and 500 were all seen as wrong answers.

8c Few candidates understood the demand. 2.4 was amongst the wrong answers seen. Some did show $\frac{rise}{tread}$ or some version of this, but most could not supply the correct values. Very few triangles were drawn on the line. The most common response was to leave the space blank.

9a Obtuse was the most common response. However, isosceles, right angle and acute were among the responses seen.

9b(i) This was very poorly done. Sketches were of a poor quality. A common error was to sketch the net of a shape or some form of triangle.

9b(ii) Candidates had no techniques to respond to the second of the QWC questions. Very few marks were awarded. Occasionally a candidate correctly named a quadrilateral they had drawn. The best responses gave the correct "parallelogram" as a name and found the angle 105^{o}. This was disappointing.

10a This common question was well answered. Some candidates earned a mark for reaching a total of £15.45 without using 8 coins.

10b Some good work was seen with evidence generally given. The modal mark was 2 as the subtractions caused the candidate problems.

10c Some good checks were seen. Candidates rounded inconsistently but were allowed the mark for sensible approximations to £ or 50p. Some lost the mark for not rounding £15.45. A few repeated the calculation from (b) and some did this and rounded only the answer.

11a Most points were correctly plotted, though the same casual marking as in Q7 caused some candidates to lose a mark.

11b Candidates often misunderstood "strength" and appeared to interpret this as a comment of the veracity of the data. Thus, "The data is strong..." or "The strength is good as there is a lot of data..." appeared. Some said "Strong no correlation", thinking that the judgement was sound. Many said "Positive" to earn a mark.

11c This was reasonably well answered although some said a line of best fit could not be plotted as the correlation was negative. Many who earned a mark either noted that a line was inappropriate as the correlation was weak or there was no correlation. However, many did not use these terms and sorting out the diverse comments was often difficult. Candidates should be encouraged to use technical terms correctly.

A502/02 Mathematics Unit B (Higher Tier)

General Comments

The paper was generally accessible with most candidates scoring between 17 and 53 marks. There were a surprising number of higher scoring candidates suggesting resitting for grades higher than C. There were only a few candidates who scored fewer than 15 marks and who would have benefited from entering the Foundation Tier rather than the Higher Tier paper.

Generally candidates were showing the working used in order to obtain their answers and so were able to obtain part marks for questions even when their answer was incorrect. The question relating to the quality of the candidates written communication (Q2) showed the full range of quality and many candidates could have improved their solutions by showing working clearly. Most candidates used rulers where necessary.

Comments on Individual Questions:

Question No. 1

Nearly all candidates scored highly on this question. Errors were rare but included not estimating in Q1c.
Answer: £5, £5, £1, £1, £2, 50p, 50p, 20p, 20p, 5p 10.97, 15.50 - 2 - 2.50 = 11

Question No. 2

There were plenty of correct answers to this QWC question. Common errors included not showing a method for the fraction or percentage calculations and occasional minor slips on the index question.
Answer: 81, 664 ÷ 4 (oe) =166, 196, 1200 ÷ 5 =240

Question No. 3

In Q3(a)(i) Only the strongest candidates could use the conventions for including the end points correctly (the solid circle to include the ends and the hollow circle for the strict inequality). In part (ii) there was a good understanding of 'integers' but in (b) many struggled with dividing by a negative.
Answer: $5 \leq x < 10$, 5, 6, 7, 8, 9, $x < -4$

Question No. 4

All parts of this question were answered well with the best solutions showing their working clearly.
Answer: $360 \div 5$, 550, 192

Question No. 5

A well answered question. Points were plotted accurately and many could give the strength and type of correlation. Possibly the wording in this question should have suggested to candidates that examiners were not looking for the one mark answer 'no correlation' which was condoned. In part (c) examiners wanted a comment about how the correlation made it relevant or not to draw the line of best fit rather than the mechanics of drawing the line.
Answer: 5 correct points plotted, weak positive, e.g. yes as there is a correlation

Question No. 6

Only a minority of candidates could make any inroads into this question on identities. Those that did tended to score all three marks.
Answer: $a = 7$, $b = -2$, $c = 14$

Question No. 7

The vast majority of candidates found this similarity question straightforward even with the added complication of unit conversions. The common incorrect answer was to leave the answer in inches scoring four out of five,
Answer: 2 feet 8 inches

Question No. 8

Gradient caused a number of problems for candidates with confusion over whether or not to put an *x* on the gradient and even how to calculate the gradient (with run/rise being common). Candidates understood about parallel gradients in (c) but only the strongest could describe 'negative reciprocal' in (d) with most only dealing with one of the two aspects.
Answer: Straight line crossing +ve *x* – axis and –ve *y* – axis, ½ , $y = \frac{1}{2}x + 6$, Neither, Not parallel as $m \neq \frac{1}{2}$, Not perpendicular as $m \neq -2$

Question No. 9

Only the best candidates were able to maintain the accuracy in their algebra long enough to get to the end of these simultaneous equations. Many candidates showed multiple attempts at solving and a few resorted to trial and error.
Answer: $x = 2.5$, $y = -2$

Question No. 10

There were many correct answers to part (a) with the common incorrect answer of 0 being quite rare. Part (b) proved more challenging. The best candidates used the laws of indices to simplify the given expression while most tried to evaluate each power at the first step. This method rarely led to success
Answer: 1, 1/9

Question No. 11

Examiners were pleased to see an increased familiarity with function notation this session. Many could score the mark in (a)(i) and then go on to at least score one in part (ii). Part (b) was more challenging and a common error was to rearrange correctly to f(*x*) = -5 but then to substitute *x* = 5
Answer: 25, $8\sqrt{5} - 6$, -0.5

A503/01 Mathematics Unit C (Foundation Tier)

General Comments

The majority of candidates were well prepared for the exam and it was encouraging again to see a large number of candidates making a good attempt at the work at this level. Work was generally well presented and working shown logically in many cases. The common questions with the higher paper proved to be challenging for many of the candidates particularly those questions that involved an element of problem solving.

Most candidates attempted all of the questions and there were a number scoring high marks on the exam but only a few very high scores. The weaker areas included the topics of unit conversion; simple calculations involving fractions; simple algebraic manipulation; the reverse circumference problem; money in a problem-solving situation; nets; volumes and surface area of cubes and cuboids; harder probability involving some problem solving, and reasoning with fractions. The stronger areas included the topics of coordinates; time; reading scales and metric measures; simple area and perimeter; simple probability, and the probability scale and unitary ratio.

A calculator is allowed for this unit and the use of calculators was more evident in this session with only a very few attempting non-calculator methods for calculations or failing to interpret the answer on the calculator correctly, although there is an issue for some in using a calculator effectively with fractions in calculations.

Comments on Individual Questions:

Question No.1

Parts (a) and (b) provided a straightforward start for candidates and these were very well answered. A few plotted a point at (-1, 0) for (b) rather than (0, -1)

Part (c) proved more difficult for some with the most common error being to use AC as a side of the square rather than a diagonal. Partial credit was awarded for this and most were able to give the coordinates of their plotted points for B and D.

Question No.2

Generally this was very well answered with accurate readings in part (a). There were a few giving 22 rather than -22 for the reading on the thermometer.

Part (b) was also well answered. The most common error was to give the imperial unit miles instead of the metric unit kilometres for the distance.

Question No.3

Part (a) was well answered and the majority of candidates were able to give the correct areas for A and B. A few found the perimeters of the shapes and there were occasionally very large incorrect areas which arose from the product of all of the lengths of each shape.

Part (b) was very well answered. A few gave the area rather than the perimeter.

Question No.4

Part (a) involving interpreting the probability scale was very well answered. The only common error was to give the second response as 'evens' rather than 'likely'.

Part (b) was less well answered but almost all candidates were able to score some marks on this question. The most common correct answer for the number of tees was orange 1, red 5, white 1, yellow 3, but there were other correct combinations. Most were able to score marks by giving the number of red as 5 or giving a value from 1 to 4 for the number of orange or for giving more yellow tees than white tees.

Question No.5

This was generally well answered in both parts. A few candidates were one hour out in one or more of their values for part (a) on the table, more often with the Thursday and Friday values.

Part (b) was answered well even by those giving a follow through answer having made an error in part (a). Some gave answers such as 37 hours and 140 minutes which they either could not convert to hours and minutes or which they left as their answer.

Question No.6

This question on simplifying algebraic expressions was answered quite weakly by many.

Part (a) was often correct but errors such as leaving the multiplication signs between the terms were made. Others gave answers of 11y rather than 18y.

Part (b) was also often correct, but many struggled with the concept of x being 1x.

Part (c) was often correct but a very common error of 4 was seen.

In part (d), the errors were in collecting the directed terms, and answers such as 5a + 7b were common. However the majority were able to get one of the terms correct. Some collected terms correctly but then left a partially unsimplified final answer such as a + - 3b.

Question No.7

Part (a) involved interpreting a probability scale. B was usually correctly given for the first response. The second response for the 20p coin was less well answered with C being a very common error. The final part for the value of less than £1 was usually answered correctly as F.

Part (b) was a challenge, with only a few candidates answering correctly. Some candidates earned partial credit for showing in working that there were seven 50p coins in the change or eight 50p coins in total from the 16 coins that Samantha now had.

Question No.8

Part (a) involving the use of a calculator and reasoning with units had mixed responses. Many scored well on parts (i) and (ii) but there were also many answers showing that candidates were unfamiliar with the fraction facility on their calculators for part (i). In part (ii) many were able to process the calculation but some failed to round their answer correctly to 4.8 with 4.7 being a common error. Part (iii) was done poorly, those that realised that the mixed units needed to be converted to a common unit before the subtraction did very well. Some tried to convert, but answers such as 144m illustrated issues with conversion factors. Some arrived at the correct digits 3024 or 3.024 but did not record a unit with their answer.

In part (b) a minority scored 3 marks. Most were unable to explain the procedure of dividing by a fraction for this question.

Question No.9

This question on equations was generally well answered.
The first three parts, involving a one-step equation were all well answered although in part (c) a few gave answers of 5 rather than 45.

The final part involving a two-step equation was also well answered by many who used inverse operations and the balance method. A few attempted trial and improvement but were usually unable to get their answer to the exact value 4.75.

Question No.10

This question involving unitary ratio was very well answered. A few, having shown a correct method, left their answer as £12.1 rather than in correct money notation as £12.10 . Some were able to divide by 7 but then multiplied by a number other than 10.

Question No.11

This question involving simple single event probability and expected values was very well answered.

In part (a), almost all gave the correct fractions or equivalents for the probabilities. A few gave word responses such as unlikely or evens which were not acceptable.

In part (b), most gave 15 as the correct response. The common error was to give and answer of 20 from 60 ÷ 3.

Question No.12

Part (a) proved to be challenging to almost all candidates. Interpreting the information given in the question into a series of procedures was the issue. The most efficient method was either to work out the distance travelled in one hour as 4000m and then multiply this by 12 hours before converting to kilometres. Some calculated the total distance without rests correctly as 57.6 km but then did not consider the rest breaks of 10 minutes per hour. For many, working appeared random and not systematic and a score of one mark for a relevant time or distance calculation was the most common score. There were many variables in the question and this was a contributory factor in some candidates failing to get to grips with what was required.

The conversion from kilometres to miles in part (b) proved to be beyond most candidates. Many attempted a division by a multiple of 10. Only a very small number had any knowledge of the relevant conversion facts. Even when the conversion factor was known, candidates multiplied instead of dividing.

Question No.13

This question was answered well by a minority who correctly identified the correct formula and were able to complete a reverse calculation successfully. A few having done this did not then round their answer to the nearest metre as requested. The most common error was to use $\pi \times 424$ to give an incorrect answer of 1332 m for the diameter. A number did not attempt the question.

Question No.14

Part (a) involved a calculation that required knowledge of the number of weeks in a year and it was surprising how many candidates struggled with this. Many used 48 weeks from 4 weeks in a month and 12 months in a year to arrive at an answer of 2352. Others multiplied by 365 or just 12.

Part (b) required candidates to show a clear strategy and explain their reasoning before deciding on the car with the greater fuel economy. There was some good work seen in this part and although few achieved the full 6 marks, many were able to achieve a mark of 3 or 4 by completing a relevant calculation correctly and explaining how this determined the answer. Most calculated the number of miles for £1 or the number of litres used by each car but did not complete the method to find the number of miles per litre used.

Question No.15

There were many fully correct interpretations of the graph in part (a). A few thought it to be a speed/time graph and consequently made errors.

In part (b), most knew the formula required and could use it successfully. Some, however, multiplied by 45 (minutes) and others divided by ¾ (or 45) instead of multiplying.

Question No.16

Again, as in question 12, the number of variables confused many candidates. The most common error was to assume that there were three friends instead of four. Some, after correctly working out the cost of the games for each person, divided by four thinking there were four games, not three. There were a good number of correct answers.

Question No.17

Few knew how to approach this question. There were many spurious attempts. Better candidates reached a correct form but then left x in their answer or added one in at the end. There were a number who omitted this question.

Question No.18

Most candidates knew that three more sides were required to complete the net and knew the dimensions of those sides. However, the rectangles were not always arranged in the correct positions. A small number drew the net for an open top cuboid. Drawings were invariably neat and accurate.

It was common to see candidates finding the volume of the cuboid rather than the surface area in part (b). Those who did try to find the surface area did not always find the area of all six faces, some only finding the area of one or two. A small number found the area of the net and failed to scale up to the full size area.

Though there were many correct answers to part (c)(i), a surprising number could not find the volume of the cube. These candidates spent their time finding an area, or areas, of the surface of the cube. Many used their answer to part (b), the surface area, to answer part (c)(ii), instead of finding the volume of the cuboid. Despite this there were a good number of correct answers seen.

Question No.19

There were very few correct answers to this question. Candidates failed to equate the difference in the fractions to the increase of petrol in the tank. A number omitted this question

A503/02 Mathematics Unit C (Higher Tier)

General Comments

Many candidates performed to a high standard on this paper showing an excellent understanding of the module content. The paper gave everyone the opportunity to show what they knew, and could do, and the candidates responded positively to this.

Presentation continues to be good, though, where a structured answer is required, candidates should take more care to show their method clearly, with notes added to explain their approach. Calculators were used appropriately, accurately and efficiently. Candidates had sufficient time to complete the paper with very few questions not being attempted.

Comments on Individual Questions:

Question No.1

There were many fully correct interpretations of the graph in part (a). A few thought it to be a speed/time graph and consequently made errors.

Most knew the formula required in part (b) and could use it successfully. Some, however, multiplied by 45 (minutes) and others divided by ¾ instead of multiplying.
In part (c), most realised to use the lower bound of 15 in their calculation.

Question No.2

This question was answered well by many though a few mistakenly left their answer to one decimal place. The most common error was to assume that there were three friends instead of four. Some, after correctly working out the cost of the games for each person, divided by four, thinking there were four games, not three.

Question No.3

Invariably, a correct answer was seen here, with just a few making a sign error.

Question No.4

A correct fraction, with correct cancelling, was seen regularly. A few candidates reached a correct form but then only cancelled the numbers and not x, while others added x back on to their originally correct answer.

Question No.5

Most candidates knew that three more sides were required to complete the net and knew the dimensions of those sides. These rectangles were usually arranged in the correct positions. Drawings were invariably neat and accurate.

It was common to see candidates finding the volume of the cuboid rather than the surface area, in part (b). Those who did try to find the surface area did not always find the area of all six faces, some only finding the area of one or two. A small number found the area of the net but failed to scale up to the full size area.

There were many correct answers to part (c)(i). However, some used their answer to part (b), the surface area, to answer part (c)(ii) , instead of finding the volume of the cuboid. Despite this there were a good number of correct answers seen.

Question No.6

A large number of candidates failed to read the question carefully enough and did not equate the difference in the fractions to the increase of petrol in the tank.

Question No.7

Part (a) was answered well, with the vast majority realising that an integer answer was required.

There were several ways to approach part (b) and candidates successfully explored them all. A common error was to assume there were two ways to get 2 on both the spinner and the dice.

Question No.8
Some candidates found it difficult to describe how the formula could be derived and resorted to giving a numerical example. Others gave a clear and succinct explanation.

The table of values was always completed correctly and many good graphs were seen in part (c). All could correctly use the graph to find the length of the edge of the cube.

Question No.9

Algebraic methods continue to be well understood. Many were successful with every part of this question.

Question No.10

Though candidates were fully aware of the method required, some failed to show a more accurate value than three significant figures for either the area of the semi-circle or their final answer.

In part (b), it was common to see candidates finding the area scale factor correctly but then failing to take the square root of this to find the linear scale factor.

Question No.11

Many found the increase in weight for one month and multiplied this by twelve. Some, however, did appreciate the compound nature of the question and did use the appropriate multiplier.

Question No.12

The tree diagram was most often completed correctly and many went on correctly to find the required probability in part (b). There are still a few who do not understand how to combine the probabilities in a tree diagram and interpret these in the context of the question.

Question No.13

There were many fully correct and nicely presented answers here. The method of solution of simultaneous equations is widely known and understood. Even so, there are still those who make arithmetic slips when equalising coefficients and others who are unaware as to when to add or subtract their equations.

Question No.14

All three parts of this question on standard form numbers were answered well. Part (b)(i) caused the most problem to candidates where some failed to reach the required final form.

Question No.15

Those who recognised this as a reverse percentage question performed well. Less aware candidates just decreased the given amount by three percent.

Question No.16

This question was an attempt to get candidates to appreciate the correct setting out of the solution to a quadratic equation using the 'completing the square' method. It was clear that many were unaware of this method and many poor attempts were made. +25 in the second row was a common error as was the omission of ± when taking the square root in the fourth row. Some, with a negative value on the right of the equals in row three, failed to realise their error when moving to row four and just discarded the negative sign.

Question No.17

There were many pleasing applications of the cosine rule seen in part (a).

In part (b), some thought the triangle to be right-angled when working out the area.

Question No.18

Solutions here fell into two camps: those who had come across this type of question before and those who had not. The first group performed well with clear, concise solutions often scoring highly. It was pleasing to see these candidates not being put off by a multiple x^2 quadratic equation to be solved and successfully using different approaches to its solution. The second group floundered somewhat, trying numerous spurious algebraic techniques.

Question No.19

Though many found the curved surface area of the cone correctly, few thought to add in the area of the circular top.

Question No.20

Key here was identifying the triangle to be used to find the angle required. Many could not do this. When this was done, candidates often correctly went on to use Pythagoras' theorem and trigonometry. Once again, marks were lost by candidates who failed to explain clearly with a diagram, with labelling to identify lengths and angles and with a written explanation, the solution they were following.

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