OCR
Oxford Cambridge and RSA

GCSE

Mathematics A

General Certificate of Secondary Education **J562**

OCR Report to Centres November 2016

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, 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.

CONTENTS

General Certificate of Secondary Education

Mathematics A (J562)

OCR REPORT TO CENTRES

A501/01 Mathematics Unit A (Foundation Tier)

General Comments:

The entry for this session was rather small with fewer than 200 scripts marked.

Marks ranged from 0 to 50 out of 60, with a mean mark of 31.4 suggesting that the paper was appropriate for the candidates intended.

General presentation by candidates was usually fine.

Comments on Individual Questions:

Question No. 1
Both parts of (a) and also (b) were well done by most candidates. In part (c), however, many candidates were unable to square –5 correctly with –25 being a common wrong response. Other errors included –5 or attempts at cubing.

Question No. 2
Although there were many fully correct solutions to part (a), there were some candidates who misinterpreted the instructions and were therefore only able to earn the SC mark.
Part (b) usually earned full marks, although in part (b)(ii) the mark was occasionally lost by a bar using the whole width between the tick marks.
In part (c), most candidates showed their working well and were able to score at least 2 out of the 3 marks. Despite this, some candidates did attempt to find the median so the nfww was needed in the scheme.

Question No. 3
Full marks were scored very often, although there were some interesting errors, including desks being 120 metres long or eggs weighing 80 kilograms.

Question No. 4
Part (a) usually earned candidates both marks. Answers earning just the B1 mark were very rare.
In part (b), it was extremely rare for full marks to be awarded, with most candidates earning just B1 for a partial explanation. There were a few candidates who incorrectly answered “yes”.

Question No.5
Nearly all candidates scored the mark in part (a), but fewer managed to earn both marks in part (b). A common error here was to use (–4,0) as the midpoint.

Question No. 6
Most candidates earned the mark for an answer of 8*c* in part (a). Fewer were successful in solving the equation in part (b). There were quite a few NRs for this part.

Question No. 7
Many candidates did themselves no favours in this question by totally ignoring the first line of the question where it stated that **exactly** 4.5 kg of vegetables were required. Many solutions contained random total weights of vegetables, and for this reason the SC marks were included in the scheme.

Question No. 8.
Fully correct solutions to part (a) were very rare. Many candidates earned only M1 when trying to calculate the median, usually for identifying either the 26 or 27.
Those who knew what the range was usually scored the mark but such candidates were in the minority.
The number of candidates earning the mark in part (b) was very small. An unexpected but surprisingly common wrong response was to say that Cerys' beans were more consistent in length because her range and median were closer together.

Question No. 9
Very few candidates managed to find the correct bearing in part (a)(i), with the common wrong answer being just the acute angle. Very few candidates realised that this angle then needed to be subtracted from 360 to obtain the bearing. In contrast, part (a)(ii) earned nearly all candidates both marks.
There were many good diagrams in part (b)(i). Unfortunately, these diagrams did not always lead to correct measurements in part (b)(ii). Indeed, such measurements were often not even attempted.

Question No. 10
A common wrong answer in part (a) was $\frac{5}{11}$, where candidates simply converted the ratio given in the question to a fraction, ignoring the phrase "total rent".
In part (b), although many candidates did manage to find the correct answer of 153, there was a fair number who divided 85 by 9 rather than by 5.

Question No. 11
Few candidates earned both marks in part (a) for the correct product of prime factors, although some did earn the M1 for a reasonable attempt at a factor tree.
In part (b) there was much confusion between highest common factor and least common multiple with an answer of 2 often being given by those who actually attempted the question.

Question No. 12
The correct answer of 29.7 was seen rarely in part (a), suggesting poor use of a calculator by many candidates.
Part (b) was equally unfruitful, with a common wrong response being just to swap the *c* and *M*. There were many blank answer spaces for this part.

A502/01 Mathematics Unit B (Foundation Tier)

General Comments

Many candidates seemed poorly prepared for this paper. Significant numbers were unable to perform simple numerical calculations and this caused them to lose marks across the paper. Point plotting was reasonably accurate.

Most candidates attempted all of the questions. The QWC question (Q2bii) was not done well this session. Geometric knowledge and understanding of polygons was poor. Many candidates did not appear able to construct an efficient strategy to solve a problem.

Comments on Individual Questions:

Question

Question No. 1
In part (a) many candidates incorrectly added 3.16 and 2 to get 3.18 and in part (b), 8.85 and 9.15 were common errors. (Aligning questions to the right and subtracting smaller digit from larger.)
In part (c) many correct answers were seen but 8.20 was not uncommon. 5^3 was frequently 15, 75 or 100. In part (e) candidates did just better than random choice from five.

Question No. 2
2(a) was well done although 18% of candidates were not able to subtract a number from 100 correctly.
2(b)(i) usually saw 1 mark being scored although many candidates then repeated the given rule about adding to 9, rather than realising that the 7 had been chosen and was no longer available from the 8 remaining cards.
2(b)(ii) was very poorly answered and only 10% of candidates scored 3 or more marks. Most either invented their own rules and ignored the given ones or gave a few examples but gave no explanations as to the significance of these. The general impression was that candidates were not able to explore a situation and reach conclusions.

Question No. 3
Parts (a) and (b) were generally well answered with only a few candidates reversing the coordinates. In part (c), few were able to give the equation of the line and many chose the option (1, 3) to (8, 3) as their answer.
Around 20% of candidates made no attempt to answer part (d). Those that did clearly did not understand gradient and "positive" and 45° were among the varied responses seen.

Question No. 4

Part (a) was often correct but few candidates could correctly calculate $1\frac{1}{3}$ right angles in part (b).

Generally no meaningful working was seen.
In part (c), 180 ÷ 3 was sometimes shown but candidates were not always able to calculate the answer. 180 was a common wrong answer but 360 ÷ 3 was also seen.
In part (d), it was surprising not to see 90° identified and many convoluted calculations were presented, many with no mention of 90 at all. When 90 was given, 90 – 67 was not always evaluated correctly.

Question No. 5
This question was disappointingly answered. Very few candidates realised that the extra cost was £1.80 per hour and that, as this was for 100 hours, the increase was £180. Most began multiplying £8.10 by 30 and then by 35 and then did the same with £9.90 and subtracted. Most got lost in the calculations and made errors. Many gave up before they finished the method. A great number did not appreciate that "EACH" in the question indicated that Manjit worked 35 hour AND Ana also worked 35 hours. Clearly, candidates did not read the question correctly and were not able to analyse the information to create an efficient strategy.

Question No. 6
Part (a) asked, effectively, for the size of one exterior angle of an octagon. Only 25% of candidates could answer this correctly. It was not surprising then that few could get anywhere with part (b). Sometimes 90° was identified for a mark. Sometimes 360 ÷ 10 was seen for a further mark.

Question No. 7
Part (a) was generally well answered although very few could mark (or understand the requirements for) two corresponding angles. Possibly the absence of clearly marked parallel lines was disconcerting.
Part (b) caused many problems for candidates. Some were able to identify that a decagon had 10 sides but 8 was a common wrong number used. Very few realised that, with a perimeter of 10*a*, the number of sides had to be a factor of 10. Hexagon was a common wrong answer. The length of a single side in terms of *a* was rarely given. Most gave a number, not related to a factor of 10.

Question No. 8
Around 25% of candidates could answer this with any success. A common error was $x = 7$ or just 7 or 8. A lot of trial and improvement was seen.

Question No. 9
Many candidates correctly plotted the points in part (a). Most went on to describe the trend in sunspot activity. Some bizarrely used terminology to suggest that these became more popular, clearly not identifying with the context.
In part (b) no candidates realised that a calculation was required. Most again described the trend.

Question No. 10
Many candidates identified graph A as the correct graph.
A significant number of candidates also offered one or two sensible reasons for rejecting the other graphs. Not many realised that D was not a line graph.

Question No. 11
Part (a) was reasonably well answered but many candidates did not use working to convert the fractions to a common form. Those who used diagrams were generally successful. Those who attempted to convert to decimals or percentages could usually convert ½ and ¾ but were less successful with the other fractions.
Part (b)(i) was well answered. Candidates struggled to answer (ii). Some correctly calculated the difference but then gave an answer of 16, being unable to use significant figures.

A503/01 Mathematics Unit C (Foundation Tier)

General Comments

The majority of candidates were well prepared for the exam and could access the majority of the questions. Work was generally well presented with working shown clearly in many cases. A few of the common questions with the higher paper proved to be challenging for some.
Most candidates attempted all of the questions and there were a number scoring high marks on the exam. The weaker areas included the topics of unit conversion, interpreting a probability scale, using area and perimeter in a context, simple fractions in context, problems with capacity and time, probability sample spaces and expected outcomes, area and circumference or a circle, quadratic graphs. The stronger areas included directed number, money, language of probability, expressions and simple equations, problems involving time and costs. It is clear from this paper that the basic algebra skills are well embedded but some key facts such as unit conversions are not. The use of a calculator was evident for most but some were attempting non- calculator methods for calculations this was particularly evident with the fractions in calculations in question 2 and 8 for example which led to unnecessary errors and loss of marks.

Comments on Individual Questions:

Question No. 1
All parts of this question were well answered. A few misinterpreted part (b) and gave an answer of 35°C, the temperature in London add 6°C.

Question No. 2
This was well answered generally and candidates were able to understand the instructions for finding the missing values. The parts involving fractions caused difficulty for a number of candidates even though the use of calculators is allowed. In part (a)(ii) a common incorrect answer was $\frac{4}{15}$ and in (a)(iii) a number gave the answer 2 rather than -2.
The first part of (b) was very well answered, but parts (ii) and (iii) involving fractions caused problems and were omitted by a few.

Question No. 3
Part (a) was well answered and the majority of candidates were able to give pyramid. The common error was prism.
In part (b), most were able to give the number of faces correctly but the number of edges was often incorrect with a common error of 12 by counting the edges on the net.
Almost all gave the correct answer to part (c).

Question No. 4
This question involving a simple money problem was well answered and all managed to score marks here. Most gained full marks but some, having calculated the money left over correctly, did not write any units with this amount. Others found the correct number of chocolate bars but were unable to convert the decimal left from the division to an amount of money.

Question No. 5
Part (a) was usually well answered. Common errors included giving the answers in part (i) certain and in part (ii) likely or unlikely.
Most were able to score at least one mark in part (b) by giving either two numbers that were less than 10 or two numbers that were odd. Fewer candidates were able to combine both of these conditions however.

Question No. 6
The conversion of units of metric measures remains an area that is weak for many candidates. Knowledge of the conversion facts is not secure.
Part (a) gave a variety of answers and knowledge that 100 cm = 1 m and 1000 m = 1 km was required. A minority were able to use these facts to convert correctly, but for others this basic knowledge was absent.
Part (b) was answered very well by those that knew 1000 ml = 1 litre. Most then converted 2.4 l to 2400 ml to carry out the calculation and almost all who did this gave the correct units. Many used a wrong conversion fact, typically 2.4 l = 240 ml and were unable to gain any credit.
Part (c) was answered well in the first two parts, although a few gave 7.80 rather than 7.8 in part (ii). Part (iii) involving one significant figure was less well answers and answers of 3300 and 3270 were common errors.

Question No. 7
Part (a) involving simple substitution was answered very well by all.
Part (b) required some interpretation and reasoning and was well attempted by many. Most who were correct, gave the expression $p + t – r$
Some of the weaker candidates gave a numeric answer here and not an expression in p, t and r. A few gave an expression in two of p, t and r and were able to gain partial credit.

Question No. 8
Some used non-calculator approaches to this question and lost unnecessary marks.
Part (a)(i) was well answered. In part (ii), many tried to use a numeric approach with £240 and another value, which was sometimes related to the previous part. The concise approach used by a few was to subtract $\frac{1}{8}$, the fraction he spends, from 1 to give the fraction remaining.
Part (b) was not well answered and many did not read the question carefully enough and chose not to use 100 and 240 given in the question to form the fraction. Some included the answer to part (a) in the spending as well to give £130 and others subtracted £30 and £100 from £240. Of those that used £100 and £240 in their fraction, a small number gave $\frac{240}{100} = \frac{12}{5}$.

Question No. 9
This question on interpreting the probability scale caused problems for a number.
The first three parts involved arrows that did not point at exactly ½, ¼ or ¾ and these were answered poorly as candidates did not use the proportions of each colour of handkerchiefs to inform their judgements.
The final part was answered very well and candidates recognised that impossible was equivalent to a probability of 0.

Question No. 10
This question involving simplifying expressions and solving simple equations was very well answered and candidate's skills have shown improvement in basic algebra. Almost all understood the correct conventions for writing expressions. The only errors of note in this question were in part (a)(ii) where an answer of 2 was sometimes given and in part (b)(i) where an answer of 4 was given by a few.
In part (b)(iii) a few candidates did not use the inverse operation in the first step and gave $3x = 26 – 7$.

Question No. 11
This question involving using information on costs and time was generally well answered.
In part (a), almost all were able to interpret the information given on the table correctly and gave the correct answer £54. Only a few used the first class fares instead of the standard class. Some showed their method but made processing errors by not using their calculator.

In part (ii), many gave the correct time interval for the journey. The most common error was an answer of 3h and 3 minutes.
The majority gave the correct speed in part (a)(iii) and worked with miles and hours to give a speed in miles per hour, the common error was to convert 3 hours to minutes and then divide the distance by 180 minutes to give 1.2.
Part (b) was very well answered generally with clear method shown in calculating the cost of the first class tickets and then subtracting this from the total fares for the journey before dividing by the cost of a standard class ticket. Errors made were usually in dividing the total cost by £75 first and not taking into account the first class tickets sold.

Question No. 12
This question proved very challenging to most of the candidates. Most were able to gain one mark by showing understanding that 9 litres was 9000 ml, but the process of dealing with the time and the proportion was challenging. The most successful candidates worked in seconds, multiplying 9000 by ½ and then dividing by 60. Where candidates had made an error in their unit conversion they were still given credit for the rest of the method.
Where candidates attempted to scale up, credit was given for scaling up to 1 hour correctly. This method seldom led to a correct answer as candidates usually lost their way.

Question No. 13
There were some good answers but for many others, this question proved challenging.
The first part was the best answered but there were some common errors such as 30 + 18 = 48 cm as the final answer and others that did the perimeter of the inside frame, or the inside frame and the outside frame added together.
In part (b), many scored one mark by finding one of the relevant areas either 540 cm^2 or 288 cm^2, but fewer completed the calculation by subtracting 288 from 540.
Part (c) proved the most challenging. The best answers calculated how many frames fitted horizontally and vertically and then multiplied these values. Some found that 6 fitted horizontally and 7 fitted vertically but then added to get 13. The most common error was to use areas within the calculation and to divide the area of the picture wall by the area of the picture.

Question No. 14
There were many correct answers to part (a). Some candidates, however, divided 140 by 3 instead of dividing by 4.
It was common to see the table completed correctly in part (b)(i). A few misunderstood the demand of the question and thought that all entries had to be 1, 2, 3 or 4.
Most knew how to find the required probability though some miscounted either the number of 4s in the table or the total number of entries. $\frac{1}{4}$ was sometimes seen as the answer where candidates gave the probability of getting 4 in one spin rather than in two spins.

Question No. 15
Candidates were not put off by the format of the question and many performed well. There were a large number of fully correct answers seen. Of those not achieving a fully correct answer, most correctly found the value of *a* and the value of *b* but a number either omitted the negative sign to the value of *c* or failed to find the value correctly.

Question No. 16
Candidates found this the hardest question on the paper. Only a handful of them were able to use the given area to find the radius or diameter and then to correctly use the circumference formula for the circle. Of the few that were able to find the correct circumference, some gave decimal answers rather than an answer is terms of π.

Question No. 17
Part (a) was invariably answered correctly.
In part (b), many candidates found one pair of lengths and stopped. Some others went on to find two or three pairs of lengths but only a few found all four pairs. A few found that 24 cm^2 was the area of the base but then tried to find numbers with a sum of 24 rather than a product of 24.

Question No. 18
Candidates had little trouble finding the value of y when $x = 1$. However, substituting -1 into the formula caused lots of problems with many incorrect answers.
In part (b), candidates could accurately plot their points on the grid but many failed to join their points. Those who did join the points often did so with straight lines. Any curve drawn was, in general, of poor quality.
Very few understood the question in part (c) and there were many who made no attempt at an answer. When correct answers were given, invariably it was the positive solution only that was supplied.

Question No. 19
All candidates made an attempt to answer this more open question but with varying degrees of success. Most commonly was for candidates not to give enough detail in their answer. Even though the question referred to two cases, some pursued just one. Others failed to use probabilities or some other means to compare the likelihood of an outcome. A number incorrectly thought that a larger number of white counters guaranteed the greater chance of a white counter being chosen. The best answers, gave the arrangements first and then recorded four probabilities of the two sets of arrangements to justify their decisions.

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

OCR Customer Contact Centre

Education and Learning
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