OCR
RECOGNISING ACHIEVEMENT

GCSE

Applications of Mathematics (Pilot)

General Certificate of Secondary Education **J925**

OCR Report to Centres

June 2013

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.

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OCR REPORT TO CENTRES

Overview

This is the third June award for the pilot specification. The total number aggregating was broadly similar to June 2012. Entries for Unit 2 at both Foundation and Higher levels were similar to June 2012, but there was a decrease in entries for Unit 1, possibly because some candidates had entered for an earlier session. Most candidates were appropriately entered and were prepared to tackle all the questions. Higher tier candidates generally performed as expected on individual questions. The exceptions were questions involving interpretation or explanation of results, particularly of geometrical statements, and questions on two topics on this specification only: flow diagrams and linear programming. Similarly Foundation tier candidates generally performed as expected, although dips in performance were evident whenever they were expected to extract data from text or a diagram to use for a calculation. Even the most able candidates struggled with fraction calculations and avoided using algebra to solve a problem.

There was little evidence of candidates misreading or misunderstanding questions, despite the nature of the specification meaning that all questions were in context and various scenarios had to be interpreted. It was pleasing that most candidates were prepared to tackle questions involving novel situations and many good solutions were seen. However, too often candidates presented their working in a jumbled fashion with no indication of what they were calculating. As a result it was difficult to award method marks.

There were a substantial number of questions which required candidates to interpret diagrams or their results. Often candidates wrote very general comments with no clear reference to readings or calculations and as a consequence they lost marks.

Overall results for Methods and Applications were broadly similar, although clearly many candidates were stronger in one specification than the other. For all papers performance was reasonably close to the forecasts at most thresholds, although unfortunately there was a substantial reduction in the proportion of Centres submitting forecast grades. Centres are reminded that these are a useful guide in the awarding process.

To improve standards further Centres are encouraged to focus on the aspects raised in the detail of the reports. Centres are reminded that they are able to analyse the performance of individual candidates and of groups, comparing results to that achieved by all candidates, using the Active Results service.

A381/01 Foundation Tier

General Comments

Overall this paper was marginally harder than that of the June 2012 session. Fewer candidates than usual were able to gain the highest marks. Nevertheless candidates made every effort to show what they could achieve, as evidenced by the relatively small number of questions not attempted.

The literacy demands did not appear to have a significant effect on candidates' attainment. The quality of number work was satisfactory or better. The use of headings might perhaps have supported candidates' progress in some of the longer multi-step questions.

As in previous sessions, algebra – more particularly using algebra - was found by many candidates to be a challenging topic. However the majority of candidates could successfully substitute into a multi-step linear equation. To gain full credit, it was important for candidates to use correct units where necessary and, in the case of dealing with estimates, to consider whether their answer was reasonable.

Comments on Individual Questions

Q1(a) This question was generally answered well. In part (i) a common error was to give more than one answer. 4 was a common incorrect answer in part (ii).

Q1(b) Many candidates found this to be a challenging question. Most gained some partial credit, but candidates needed to realise that there were several rough diamonds shown in the picture.

Q1(c) In part (i) the majority of candidates were able to gain at least half the available credit. 21 was a common error when identifying a prime number. 5^2 equated to 10 was another common error.

There were some good responses to part ii) with clear and precise calculations shown (usually annotated). A number of candidates gave purely verbal explanations without any calculations shown. Most gained some partial credit by doing an initial calculation needed to solve the problem, for example calculating the number of minutes or hours in a year.

Q1(d) Most candidates gained at least partial credit here. There was sometimes a lack of clarity in labelling. Part (ii) attracted the most correct responses and part (iii) the least – but the difference was marginal.

Q1(e) Over two thirds of candidates were able to measure the angle to the required accuracy. Most errors involved reading the incorrect scale, although responses of 45° tended to suggest that an estimate had been given.

Part (ii) which involved recall of alternate angles was correctly answered by the majority of candidates. Common errors were 43° (from part (i)) or 130°.

Part (iii) involved two steps and was found by the majority of candidates to be challenging. Some gained partial credit.

Q1(f) Only a small minority failed to gain any credit here. Selecting D was a common error. Candidates' clarity of choice was good and there were few ambiguous choices.

Q1(g) A significant number of candidates found this part question challenging. Given some of the responses it appeared that a number of candidates measured the diagram.

Q1(h) Part (i) was very well answered by candidates of all capabilities, showing that use of a two-step formula was secure for the majority of candidates. In part (ii) a number of candidates were able to perform the actual calculation, but some did not round their answer correctly.

Q2(a) Part (i) presented few problems. The main error involved choosing the wrong operation. Similar errors were observed in part (ii)

Q2(b) About half of the candidates were successful with this piece of recall of content. Overall, candidates' understanding of powers and indices could be improved.

Q2(c) This was one of the most challenging questions. Overall, candidates' understanding of fractions and how to apply them could be improved.

Q2(d) Although this was well answered by the majority of candidates, many failed to gain credit by missing the fact that the answer to part (i) was required in millimetres.

Parts (ii) and (iii) enabled the majority of candidates to gain at least half the available credit. Part (iii) followed through from part (ii) and almost three quarters of all candidates gained full credit.

Q3 The majority of candidates found this question to be a challenge. This was particularly evident in part (b), where candidates had to form an equation. However most gained a follow through mark for identifying the type of triangle – probably based on their observation of the diagram.

Q4(a) This question proved to be more challenging than had been anticipated. Candidates' estimates needed to be of an appropriate order of magnitude.

Q4(b) In part (i) almost three quarters of candidates gained full credit, but a noticeable number seemed to confuse multiplication by 0 with multiplication by 1, leading to 300.5 as a common wrong response.

Most candidates were successful in plotting the points in part (ii). In part (iii), 7 and 7.7 were common wrong answers.

Parts (iv) and (v) were not well answered.

Q4(c) This proved to be a challenging question. There was evidence of guessing and of truncating rather than rounding.

A381/02 Higher Tier

General Comments

Candidates were well prepared for this exam and generally performed to a pleasing standard. Most marks ranged between 20 and 55, with roughly equal numbers of candidates scoring above and below this range. Presentation of written work was often good with working that was easy to follow. There was no evidence to suggest that candidates were short of time on this paper, although some candidates made no attempt at some of the more challenging questions.

Comments on Individual Questions

Q1(a) Part (i) proved to be a nice start to the paper, with the majority of candidates manipulating the fractions in a sensible way in order to compare the marks. Roughly equal numbers of candidates chose to use either fractions (often with denominators of 10, 100, 120 and 600) or decimals.

Part (ii) was also answered well. Common errors usually stemmed from giving an answer of 3 for equality. Some worked with marks out of 40 and gave an answer of 7.

Q1(b) In this part the large majority of candidates were able to add the given fractions and go on to obtain the correct answer. Some candidates added the numerators and denominators, whilst others simply wrote numerators with denominators and + signs omitted. This sometimes resulted in the final answer of 9.

Q2(a) The majority of candidates were able to calculate the correct area of the kite. For many others, recall of the correct formula for the area of a triangle proved a problem; 14.7 was a common wrong answer for these candidates. Some candidates used the correct formula but doubled their answers, thinking they were calculating one of the four triangles.

Q2(b) & Q2(c) Candidates who did not earn all the marks in part (a) were able to earn the follow through marks in the remaining two parts. Most candidates earned the mark for the volume in part (b), although in part (c) some candidates failed to recall the density formula and simply multiplied the volume and the mass.

Q3(a) A large majority of candidates recognised a pair of similar triangles. Common errors included triangle QLM or triangle JQR.

Q3(b) This part proved more of a challenge, even for some of the more able candidates, with only a small minority earning the mark. Some had an appreciation that the sides were not in proportion, but failed to give a complete explanation; statements such as 'they have different lengths' and 'the sides are equal' were common. Other incorrect statements included 'because they are congruent', 'they have the same angles' and 'they have different areas'.

Q3(c) The responses to this part produced a good spread of marks with more candidates earning the higher marks. Many candidates were able to calculate the missing angle, although it was also necessary to produce a structured response with full reasons. Some attempted to provide full reasons but there was sometimes confusion over corresponding and alternate angles. The most successful candidates chose to state angle ARQ = 38 and then use triangle JRQ. It was not sufficient to list some geometrical properties as reasons. It was expected that reasons would be identified with the appropriate step in the working.

Q4(a) It was common to see candidates attempting to find the cost of equal volumes, often 1ml or 100ml and sometimes a litre or a common multiple of 200 and 330. Others attempted to calculate the amount of conditioner for either 1p or £1. Many candidates picked up at least one mark. In some cases marks were lost through a lack of units or a misinterpretation of the calculation carried out. It was common to see errors such as ml per pence when it should have been pence per ml.

Q4(b) Candidates were expected to calculate the contents of the smaller bottle and obtain an answer that rounded to 75ml. Many simply worked with linear factors while others worked with height and cost. A minority of candidates worked from the answer and were able to score some marks for a complete calculation. Those appreciating the need for a volume scale factor usually went on to score both marks.

There were some candidates who made no attempt at part (b)(ii). Those that did attempt the question generally made good progress and scored most, if not all, of the marks. Candidates were asked to show that the cost per ml in the small bottle was twice the cost per ml in the large bottle. It was expected that the candidates would show this by performing a multiplication or a division, rather than just stating it. Some candidates calculated the amount of shampoo per £ or pence. In such cases candidates were required to give a suitable statement to justify that the cost per ml was doubled, in order to gain full marks.

Q5(a) A large majority of candidates picked up both marks for finding an expression for the sum of the three angles. Some lost a mark by going on to simplify their answer of $8x - 20$ by cancelling and giving final answers such as $2x - 5$. A small number went on and solved the equation ahead of time.

Q5(b) Candidates were usually less successful than in the previous part. Most candidates who wrote $8x - 20 = 180$ usually solved the equation correctly, but some wrote $8x - 20 = 0$. An answer of 20 was quite common following an incorrect rearrangement i.e. $8x = 180 - 20$.

Q5(c) Candidates were generally able to substitute their values of x to find the angles of the triangle and a large majority of candidates earned all the marks. Some candidates lost marks when their substitutions produced negative angles. In many cases candidates did not check the sum of their three angles.

Q5(d) This was generally well answered.

Q6(a) A large majority of candidates calculated the correct value of the house after three years. There were roughly equal numbers who did this annually as those who obtained the value by multiplying by 1.024^3. Some of those who used the annual method either tended to round numbers prematurely and lose the final accuracy mark or make numerical errors amongst the various calculations. Some attempted to calculate the increase in value by calculating 2.4% and multiplying by 3 whilst others had errors converting an increase of 2.4% to a multiplier, and so 1.24 was sometimes seen. In a small number of cases candidates multiplied 225 000 by 2.4^3 but had little idea that the answer was unreasonable.

Q6(b) Candidates often didn't recognise the need to use reverse percentage, with only a minority earning all three marks. Of the rest, slightly more reduced 171 000 by 5% than those who increased it by 5%.

Q6(c) A large majority earned at least one mark but many then lost the final mark by failing to round their answer to 3sf. Others struggled to cope with the order of operations on their calculators and obtained a wide variety of answers.

Q7 This was a challenging question. Some candidates attempted to work with prime factors of 300 or 10. Others chose to work with factors and multiples. In many cases it was more a case of trial and improvement, finding factors, etc. of random numbers. Some candidates attempted to use a Venn diagram approach but their understanding of LCM and its prime factors often let them down.

Q8 The question produced a good spread of marks, with only a few candidates unable to score any marks. The pictorial presentation helped most candidates to set up two equations. Once set up the majority attempted the elimination method. Many were successful but the occasional numerical slip resulted in wrong values for the square and circle. Some stopped at this point, failing to evaluate the value of all nineteen symbols. Others carried on and obtained the correct value but some mistakenly added up the values of the rows and the columns and then added these results.

Q9(a) It was rare not to award a mark in part (a).

Q9(b) A large majority of candidates drew the correct flight path, but a common error was to draw the flight path 30º north of east.

Q9(c) Part (c) produced a good spread of marks, with more candidates earning marks at the higher end. Those who measured the appropriate distance generally went on to calculate the correct time, usually involving distance ÷ speed. As always, some treated the decimal hours as hours and minutes and lost the final mark. As an alternative, some candidates calculated that 120mph was equivalent to 2 miles per minute and used this approach to calculate the time in minutes, usually converted to hours and minutes correctly. A surprising number of candidates calculated the time taken before the aircraft was within range but, with appropriate working, were able to earn most marks.

A382/01 Foundation Tier

General Comments

All candidates appeared to have sufficient time to complete the paper. It was encouraging to see that candidates remain able to apply their mathematical understanding to both familiar and unfamiliar situations. It was pleasing to see so many candidates showing their calculations and method to justify their answers. There was an improvement in the way students answered the QWC questions (Q2(b)(iii), Q5(b)(iii) (where students had to decide what they felt was a 'small' and a 'big' points value of diamonds) and Q7(c) (payback time)). Students seemed more confident in starting these questions without the need for full directions.

Comments on Individual Questions

Q1(a) There was a lot of success in this part question, with a good number of candidates being awarded full marks. In part (ii) a minority of candidates found the '6' but either added no units or the wrong unit, 'jin'. In part (iii) the majority were correct with a few losing the second mark by not cancelling down their correct fraction.

Q1(b) In parts (i) to (iii) many candidates simply measured the length of the rocket, rather than estimating the length by comparing it to the height of a person. Such candidates could still score full marks in parts (ii) to (iv). A significant number of candidates managed to compare their expected height of the rocket in part (iv), with reference usually made to the doubling aspect or the 500g which would be needed to reach 1km. In part (v) the vast majority of candidates gained full marks, with 75 usually being the value seen when one mark was awarded.

Q2(a) In parts (i) and (ii) virtually all candidates scored highly. There were also many accurate and carefully presented answers to part (iii), with lots of supportive calculations shown. In part (iv) some students clearly found it difficult to co-ordinate thoughts from a chart and a table comparing maize production in different countries.

Q2(b) In part (i) some candidates either doubled the \$135 or multiplied it by 4 rather than the necessary 8. A few candidates failed to express their answer as a probability in (ii), often leaving their answer as a ratio 14:6 or in some cases a vulgar fraction $\frac{14}{6}$. In part (iii) most candidates managed to successfully subtract the \$300 from their value in (i), though very few then went on to use their probability to compare expected savings after paying the \$300. A small number considered the next 20 seasons rather than simply 'next season', though these candidates usually presented logical solutions and they were well-rewarded. Parts (iv) and (v) were nearly always answered accurately.

Q2(c) In parts (i) and (ii) there were a lot of successful answers seen. Candidates are clearly a lot more comfortable now with the use of inequalities and writing their own inequalities.

Q3(a) A large number of correct answers were seen in parts (i) and (ii), with correct fractions being in the usual format. Correct decimals were also seen. A few candidates simply counted to '37' and '54', rather than trying to identify a probability.

Q3(b) Part (b) proved extremely challenging to all but the strongest of candidates. Common errors included finding the mean of the days to be delivered without reference to the number of letters, or finding the mean of the CAO column.

Q4(a) Some candidates seemed to be completely unfamiliar with spreadsheets despite them being common in several GCSE subjects. Part (i) was typically correct, though in part (ii) a wrong answer of £285.31 was regularly seen. In part (iii) there were a number of correct answers seen which was encouraging.

Q4(b) In parts (i) and (ii) candidates seemed to confuse themselves by being unable to follow the rule of 70. Some did correctly calculate the 7 months in part (i) but then made the wrong conclusion based on their value found earlier in part (a)(iii).

Q5(a) A pleasing number of correct responses were seen in parts (i) and (ii). Where errors occurred candidates either chose the wrong calculation to perform or they tried to use the inappropriate part of the comparison between carats, grams and points of diamonds. In part (iii) the best answers were found where candidates chose to use the same units, most commonly writing 100 000 kilograms as 100 000 000 grams, before proceeding to the correct ratio. If candidates failed to equate units then they still could achieve 2 marks for their calculation expressed as a ratio. The most common wrong answer was 1:1000 000, which was merely repeating the mass of the Kimberlite given in the question.

Q5(b) Parts (i) and (ii) were answered extremely well, showing that candidates have a good understanding of how to use a scatter diagram. The best answers in part (iii) were exemplified by candidates usually choosing a 'big' diamond to be 100 points and then using a variety of 'small' diamonds to make the same points value. This usually meant either 5 @ 20 point diamonds or 4 @ 25 point diamonds and finding the corresponding monetary values of their 'big' or 'small' diamonds. A very small number of candidates found the value of a 'big' diamond and an equivalent points value of 'small' diamonds but then made the wrong conclusion. Candidates who did not manage to equate points values often managed to find the value of either a 'big' or a 'small' diamond.

Q5(c) A significant number of candidates found the actual increase between gold and diamond between 1990 and 2011, rather than attempting to consider the rate of increase. Very few candidates could see beyond simple subtraction sums. A few fully correct solutions were seen involving the percentage increase found for diamond and an understanding of index numbers shown for gold, in addition to the correct conclusion.

Q6(a) A good number of candidates managed to find the correct 20% increase figure. A minority of candidates found the 60,000 (20% value) and then either subtracted it from the original amount (300,000) or failed to do anything with it.

Q6(b) A lot of correct answers were seen here, with 1 metre being a very common correct answer. A few candidates wrote 3 metres which was the width of the last wider section rather than the diameter of one circular watered area.

Q6(c) A lot of fully correct answers were seen in this part, though answers of $\frac{1}{3}$ in part (i) did not score as they seemed to be the fraction shaded in the 13:00 diagram rather than reflecting the amount of land watered within the five hours.

Q6(d) A minority of candidates showed a correct method for $\pi \times 400^2$ but then spoiled their answer by equating 400^2 with 800. A significant number of correct answers were pleasingly seen.

Q6(e) In part (i) a few correct answers were found by subtracting the area of the circle from the area of the square. Others correctly estimated the light grey area in one corner and then multiplied by 4 and then by 10,000. A small minority of candidates successfully found an estimate of the number of light grey squares in one or all four corners but then did not go on to multiply by 10,000, thus securing only one mark. In part (ii) many correct answers were seen, though occasionally answers in the range 55 to 59 were seen by candidates who failed to subtract the length inside the circle.

Q6(f) Most candidates managed to use the graph correctly to answer part (i). A minority of candidates managed to successfully use the graph to find the 0.6 required, but this then needed to be multiplied by 50,000 to reach 30,000. A few inventive candidates divided the 30,000 by 50,000 to get 0.6 and then said this was the value associated with 3mm on the graph. A small minority of candidates were successful in finding the correct equation connecting the number of millimetres of rain and the number of gallons of rain. A common error in part (iii) was for candidates to arrive at g=5r or equivalent; this showed some understanding but not how the variables were correctly related.

Q6(g) In part (i) few candidates managed to correctly complete the formula in the cell. Values of 30 and 26910 were regularly seen in the formula rather than cell references. Few candidates knew how to use trial and improvement in part (ii), and very few totally correct answers were seen. Some candidates arrived at the correct answer with no working out shown. A common error was to find the cube of their chosen value and then subtract 0.1 squared rather than 0.1 times their v-squared. Many fully correct answers were seen in part (iii), with only occasional lapses into a full or part surface area. Part (iv) was usually well done with lots of correct answers, though some candidates added a top to their water tank with a sixth rectangle or equally had four correct faces.

Q7(a) In this part few marks were seen at Foundation level. Marks were usually awarded for twelve rectangles placed within the roof with essentially two rows of six panels. Very few candidates followed the advice to 'include all relevant measurements on your diagram'.

Q7(b) Candidates were highly successful in this part of the question, with the most common error being to lose accuracy with an incorrect answer of 10 hours.

Q7(c) There were a number of candidates who successfully found the 20 years required and then made a comment as to whether Evan should buy the solar panels. Very few managed to refer to an assumption which was usually along the lines of the price of electricity being sure to rise in future years. Some candidates made errors finding the 40% of £1000 or confused themselves by using the expected cost per year of £600 to estimate the payback time. Such candidates did then gain credit if they divided the £8000 by their annual saving and they could still gain the conclusion and assumption marks.

A382/02 Higher Tier

General Comments

There was no evidence to suggest that candidates had insufficient time to complete the paper.

Good use of calculators was evident throughout, with relatively few marks lost due to errors in rounding or truncating. Graphical work, including accurate reading of scales, has generally improved. However there was evidence that some candidates either did not have all the correct geometrical equipment for a mathematics examination, or that they did not know how to use it.

Candidates should be aware that method marks are awarded where their method is shown. This means that they should write out their calculations clearly so that examiners are able to follow them. Clear working greatly adds to demonstration of a candidate's mathematical knowledge and understanding and allows them to gain valuable marks where they have not managed to reach a fully correct solution. Finally, candidates should consider their final answers and/or part answers with respect to the context and whether or not these answers are sensible.

Clarity of explanation and mathematical justification is an important skill required for this paper. There was evidence that some candidates avoided all questions where an explanation or justification was required. Interpretation of results is equally as, if not more, important than mechanically calculating values. Where reasons are required candidates need to be aware that in a mathematics paper this could mean calculating values and/or comparing values they have just calculated and giving a brief explanation.

A very small number of candidates would have been better suited to the Foundation tier paper, as they did not demonstrate the knowledge and skills required for the demand of a Higher tier specification. Examiners also noted that some candidates appeared not to have covered all of the content of this specification, in particular flow diagrams and linear programming, both of which are topics specific to GCSE Applications of Mathematics.

Comments on Individual Questions

Q1 Many candidates did not appreciate that different information was being given in the table and the graph. There were a number of different, equally valid, approaches. The best answers calculated the 2011 gold price and compared this to the 2011 diamond price, or calculated and compared the relative increases in value. Common errors included not appreciating the meaning of index value, not knowing where to read the scale and poor communication.

Q2 There were very many good responses to this question, with candidates showing a good understanding of what was required.

The answer to part (e) involved one team overtaking another. It would have been advisable for candidates whose graph did not show this to revisit their answers to an earlier part of the question and check their work thoroughly.

Q3(a) Parts (i) and (ii) were generally correct.

Q3(b) Candidates found this part more challenging. Those who knew how to calculate a mean generally did not make any arithmetical errors. The most common error was 40÷6.

Q3(c) This required a written response. The best answers referred either to their calculated probabilities or comparison of means and linked this to a reason. Poor answers just restated a probability or an average.

Q3(d) The best responses in part (d) recognised that repeating an experiment or investigation does not generate identical results. Whilst most candidates chose 'no', they usually gave social issues such as traffic, weather, volume of letters, time of year etc. A small but noticeable number changed the variables of the experiment by stating fewer or more letters and different destinations.

Q4(a) Candidates did not seem to appreciate that a "sketch" simply means not to scale. A clear diagram with dimensions of both panels and gaps was still needed. A number of candidates scored 0 as they had 3 rows of panels. The majority were able to score 1 mark by drawing either 12 panels without dimensions or 12 panels the wrong way round. A common error for those who scored 2 marks was either omitting the gaps or just having 0.3 on all sides. Just a few diagrams with 10, 11, 13 or 14 panels were seen. A small but pleasing number of full and complete diagrams with both 0.9 and 0.8 were seen.

Q4(b) Parts (i) and (ii) were generally correct.

Q4(c) Part (i) was generally correct. The best responses in part (ii) showed the method used to find the required area and most candidates broke the area into chunks. In some cases the working indicated that candidates made the question more complex than necessary. A very small number simply repeated their 10.5 from part (i).

Q4(d) Good responses to part (i) explained their reasoning and included figures from dates across the month as evidence. It was important not only to concentrate on the day(s) in question but also to look for trends with the rest of the graph. Both 'no' and 'yes' were acceptable if the reasoning was sound, with the majority of candidates choosing 'no'. Those who tried to justify 'yes' rarely gave sufficient or relevant examples.

In part (ii) the best responses showed the method used to find the median date. A significant number gave the 16th as the date (indicating that they understood what the median was), but did not try to order the bar heights / dates. The 9th, 11th, 21st and 25th were all common answers but tended to only score 1 mark as it was rare to see any working, in either the space or on the diagram, to be able to award the method mark.

Q4(e) A good number of excellent, well written and clear answers were seen here. Common errors included 1750 × 3.1 and using 43 in place or 43.3 or 3 in place of 3.1. In these cases the fourth method mark could often still be awarded. A relatively small number of candidates made arithmetic or unit errors.

Q5(a) Candidates who understood the situation either applied the correct method or used a sketch and generally did so correctly. A common error was (32, 32), with many failing to use their correct sketches appropriately.

Q5(b) The best responses used Pythagoras theorem with good sketches and clear working. Common errors included a final answer of 32 or 64. Weaker candidates failed to realise that a triangle and Pythagoras were needed. Only a minority of candidates attempted a scale drawing and these were often too inaccurate to score any marks.

Q6(a) Good responses usually showed clear working of 4 or 5 trials and their outcomes to the required degree of accuracy. A small number of candidates did additional work to a greater degree of accuracy than was needed. Common errors included $(0.6x)^2$ or ignoring the x^2. Attempts to solve the equation algebraically were unsuccessful.

Q6(b) Part (b) demonstrated that the majority of candidates had a good understanding of calculating with ratio. Common errors included misunderstanding how much space there was in the tank or using either 16 or 64, but these often gained all the special case marks.

Q7 This whole question proved successful with almost all the candidates who answered it. A small number of candidates omitted to answer it. The question topic is specific to this mathematics GCSE only.

Q7(a) A common error in part (a) was to give income tax paid as the final answer.

Q7(b) In part (b) a small number of candidates made careless errors with either the figures or the signs.

Q8(a) It was evident in part (a) that candidates either did not have the correct equipment or were not prepared to use it.

The best responses to part (i) showed construction for at least two angle or line bisectors, demonstrating an understanding of geometry, with C correctly marked. Candidates who chose to draw only one bisector appeared to place C at random somewhere on this line.

Part (ii) was generally correct or missing.

Q8(b) In part (b) a high proportion of excellent solutions were seen, with the sine rule being the preferred method. Some chose to split x into 2 parts and used right angled triangles; 8cos27 to find 7.128 was the most successful approach here. Others began by using the sine rule to find the third side of the given triangle (opposite to 27 degrees) followed by the cosine rule. In a few cases the sine rule was applied with an incorrect angle/side pairing. Finding 117° was the limit for some candidates.

Q9(a) This was generally correct.

Q9(b) This was less well-answered, although M1 was often given for 9/120. Another common error, 69/120, did not achieve any marks.

Q9(c) There were a number of possible like with like comparisons to use as justifications. The most successful justification was comparing 0.15 with 0.01. Common errors included comparing either 0.15 or 126 with just one day; finding 126, 8.4 or 42 but not making a like with like comparison; calculating probabilities out of 802, 815 etc., rather than out of 840, or failing to deal with the sample size of 120 and the whole school number of 840.

Q9(d) A simple two way table was all that was required, but some candidates gave frequency tables instead. In two way tables the use of ages for year groups was a common error.

Q10(a) & Q10(b) This question was poorly attempted by a significant number of candidates who did not appear to have been prepared for questions on linear programming, in particular parts (a) and (b) where the common error was to substitute numbers into the inequality.

Q10(c) Well-prepared candidates were able to give a fully correct response with almost no arithmetic errors seen. Of the remaining candidates some showed some understanding by choosing values in the correct region and calculating profit, while others chose non–integer values or values outside the incorrect region.

Q11(a) This was consistently well answered.

Q11(b) In part (i) candidates who recognised that Pythagoras theorem was needed were generally successful. Common errors tended to be circular arguments involving the use of area, circumference, arc length or surface area.

Part (ii) highlighted the need for candidates to set their working out in a coherent manner. There were some excellent responses seen. The most common incorrect answer was 270 with no working, showing a lack of appreciation that a 4 mark question will require something more. Other incorrect solutions attempted to use trigonometry.

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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