RECOGNISING ACHIEVEMENT

GCSE

Applications of Mathematics (Pilot)

General Certificate of Secondary Education **J925**

Examiners' Reports

June 2011

J925/R/11

Oxford Cambridge and RSA Examinations

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General Certificate of Secondary Education

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EXAMINERS' REPORTS

Chief Examiner's report

For the first time all papers were available for these two specifications, Methods in Mathematics and Applications of Mathematics, which form the linked pair pilot GCSE. The largest entry was for Methods paper 1 with more candidates for Higher tier than Foundation tier. The entry for Methods paper 2 was higher than that for paper 1 in January, indicating that some centres entered candidates for both paper 1 and paper 2 this June. The entry for Applications paper 1 was significantly higher than in January whereas Applications paper 2 was only entered by candidates from 2 centres.

The papers proved to be accessible to all the candidates, although the Higher tier examiners felt that some candidates would have been more appropriately entered at Foundation level.

In general candidates performed less well on questions covering topics which are unique to the linked pair specification. In Methods 1, whilst candidates showed a greater understanding of Venn diagrams than had been demonstrated in January, they found set notation difficult to use. In Methods 2, tessellations and algebraic proofs were stumbling blocks. In Applications 2, candidates were not confident with finding the area under a curve and using AER to find total interest received.

The Methods 1 report draws Centres' attention to the fact that probability only occurs in this unit and, given the breadth of the probability statements, some aspect of this topic will almost invariably be assessed each series. In general, topics which are unique to a single unit are more likely to be assessed on a particular question paper than those which are repeated across several papers.

Centres will have noticed that, in the Applications papers, there are more questions set in context than there were in January – this should be expected in future papers.

In all papers there were a number of questions which expected candidates to be able to interpret and analyse problems and either to use mathematical reasoning to solve them (Methods) or to generate strategies to solve them (Applications). In general these questions did not have a greater omission rate than other questions, which is an indication that candidates were appropriately prepared to attempt these more novel questions. It was pleasing to see in a number of instances that these questions opened up an opportunity for candidates to select their own method to solve a problem. Unfortunately, all too frequently, candidates appear not to have considered a problem in sufficient depth, failing to consider all aspects or the different strategies that could be applied.

In those questions identified as QWC most candidates made an effort to show their methods clearly and to explain their results. Weaknesses in responses included a failure to use correct terminology including that for line segments (for example A to B used instead of AB) and for angles, and the use of incorrect mathematical language when, for example, describing shapes. Communication was always much clearer when candidates stated what their calculation referred to, for example 'area of semi circle, diameter BC, is ...', and when candidates avoided presenting their answers in continuous prose.

A number of centres failed to provide forecast grades for the units. These should always be provided.

Centres have adopted various entry policies for this pilot. Some are only entering a few groups within each cohort. Some are entering candidates for both Methods 1 and Applications 1 units in Y10 and then, presumably, the second units in year 11. Some are entering for all of Methods in Y10 and all of Applications in Y11. Some centres appear to be entering for all units for both qualifications in Y11. Almost all the candidates certificating the Methods qualification this summer were from Y10. Overall the results were encouraging. Although performance was slightly lower than forecast, examiners considered that this could largely be attributed to gaps in coverage of the specification. It is hoped that will be less of an issue in future years.

A381/01 Applications of Mathematics 1 (Foundation Tier)

General Comments

Meaningful comparison with the previous series is difficult as the number of candidates entered for the earlier series was small - about sixty. The number entering the present series was just over one thousand. Nonetheless, subject to the obvious caveats, there is evidence that the overall quality of the work submitted was less good than that of the previous series. This may have been the result of centres' entry policies regarding this new specification. Slightly more than a third of all candidates gained more than half the available credit whilst just under a fifth gained less than a quarter of the credit available.

In common with the previous series, the facility rates of the newer "applications" items were noticeably lower than that of the more "traditional" GCSE items. Performance on questions with an algebraic content tended to be less good than those involving number or geometry which was similar to the previous series.

There were occasional instances of part-questions not being attempted. This peaked to a rate of almost 10% for candidates who did not attempt any part of Question 8. This fits the general insecurity regarding using algebra to solve problems mentioned above.

The literacy demands of the paper did not appear to deny candidates access to questions. The legibility of writing and number work was usually at least satisfactory although the clarity of working in Question 3(e) was sometimes found wanting.

Not all candidates seemed to be aware of the importance of showing working and specifically the instructions to "show all working", "show how you arrived at your answer", "justify your answer with working" etc. in individual questions. It is impossible to award partial credit without unequivocal evidence of appropriate working.

Comments on Individual Questions

1 Part (a) was found challenging by some candidates and particularly by the least able. Only a small minority of all candidates gained full credit, with about a third failing to gain any credit. "Clockwise", "up" and "down" were common wrong responses. In part (b)(i), over two thirds gained full credit. Errors resulting from confusion between area and perimeter/semi-perimeter were indicated by answers of "580" or "290". There were also some instances of incorrect multiplication. The conversion between metric units is always challenging to foundation candidates, part (b)(ii), was no exception as only a third answered correctly. Many different powers of ten times three were seen. What was perhaps most disappointing where those who gave an answer greater than 3000.

2 In part (a), a very large majority of candidates were successful, including just under half of the least able, however instances of correct calculation followed by a wrong answer, due to poor subtraction, were observed. Common wrong answers were "36" and "38" (the former very obviously a result of incorrect application of the subtraction algorithm). Part (b)(i), although found accessible by a large majority, saw some rounding; candidates may have been influenced by the next part of the question. In part (b)(ii), a majority were able to perform the correct rounding and almost a quarter of the least able were successful. Common wrong answers were, perhaps predictably, "98000", "9700" and "100 000". Part (c), was found difficult by a minority of candidates. Partial credit was available for those who initially obtained the correct fraction but incorrectly simplified it. A small but noticeable number of candidates focused on the number of games lost – 14. Only slightly more than a third of candidates failed to gain any credit at all.

In part (d)(i), the question required candidates to develop an equation, this was found by many to be too challenging and few candidates experienced any success. Only a small minority attempted to use any form of recognisable algebra as illustrated by the common answer of "111". There were many, seemingly random, different combinations of signs, letters and numbers. In part (d)(ii), even if there was little understanding of the previous part many candidates gained some credit (which strongly suggested that candidates could understand the situation itself). There was even some correct directed number work seen on the odd occasion. Overall "10 UFOs" and "100 Mother-ships" were the most common wrong responses. In part (e)(i), although correctly answered by the majority of candidates, there was sometimes confusion between percentages and fractions leading to a response of "¾". In part (e)(ii), correct answers were forthcoming from over three quarters of candidates which was gratifying given the involved nature of the problem. Common wrong responses were "30", "40" and "1 minute 20 seconds". Full credit was given to candidates who converted 120 seconds into 2 minutes and correctly stated the latter units.

3 In part (a), the most common correct answer was "120 cm" however there were many answers with the units missing and quite a few with unrealistic lengths in cm and m. About a third failed to gain any credit. In part (b), only a small minority were able to measure the angle given. Poor use of the scales on a protractor was obvious, with the answers being obtuse, rather than inaccuracies in the actual measurement. The question was not attempted by almost one in ten candidates which suggests perhaps some candidates lacked protractors. Part (c)(i), was a very well answered question with most of the least able gaining some credit. Partial credit was available for identifying the correct Bronze or Gold medallist but this was only awarded on a few occasions. This question allowed the weakest of the candidates to score, especially after a poor start. In part (c)(ii), A significant number of candidates explained perfectly well how to show that Balvinder was right but failed to gain credit by not supporting this with numerical evidence. The rubric does specifically state "Show clearly how you decided". The question was found especially difficult by the least able however just over a third of all candidates were able to gain at least partial credit. In part (d), only a minority were able to gain any credit; just over a third scored full marks. Many candidates attempted to use the standard speed formula distance/time to arrive at an answer of about "9.07" rather than use the given formula which worked in mixed units. In part (e), some candidates worked systematically through the question calculating the grants and the amount paid by Jezz but made calculation errors – usually part (b) where they calculated 5% of 1846 rather than 1346. Despite this they then managed to score 4 marks. A few candidates just stated which they thought was the cheapest and performed calculations around that grant. The mark scheme was effective in awarding marks for different levels of comprehension of the question and the quality of the pupils' written mathematical communication. However, overall about a half of all candidates failed to gain even partial credit.

4 In part (a) only a minority – a third – experienced success. It was apparent that a proportion had very little idea of how to approach the question. Either a simplified or factorised form of answer was acceptable. In part (b)(i), most responses were correct. Fully embedded answers (e.g. "2 x 8 = 16") were acceptable. The occasional "14" and "7" were seen as the answer. Part (b)(ii), was mostly correct with instances of correctly embedded answers. Three quarters of the least able were successful here.

5 In part (a), a large majority were able to correctly identify C as being congruent to A. Part (b), was the more challenging part of the two part questions relating to the recognition of the properties of shapes. Only a very small minority correctly indentified the proper triangle. In part (c), a majority successfully gained at least partial credit. Some diagrammatical answers were seen showing the triangles fitting together. Many correct answers of "4" were seen without any working (possibly because the most common length of the triangles was 4). Some credit was available if "4" was seen clearly as an area and not a length in the working. For full credit "4" had to clearly be intended as the final answer.

6 In part (a), a small majority gained full credit for this 'puzzle'. It was generally poorly answered with any three acute angles being chosen quite frequently. There was very little evidence of working seen, especially any attempt to use 180° (the angle sum). In part (b), a large majority gained at least partial credit but only a quarter gained full marks.

7 In part (a), only a minority were able to correctly identify the two prime numbers required. Some candidates wrote down just one of the products whilst others put primes on either side of 65. In part (b), the majority of candidates correctly gave the two primes. This was better answered than the previous part but "19 and 2" was a very common wrong answer – a misinterpretation of "factor" for "sum" perhaps. In part (c), the majority of candidates correctly answered the question. A common wrong response was 7 – some misunderstanding of "division by three" with "finding the cube root" perhaps. In part (d), almost two thirds of candidates correctly wrote down the square root of 13. In part (e), some good clear answers were seen explaining the reason the number was not a prime. There were several statements made which were true but did not answer the question whilst others were mathematically incorrect. Overall a minority gained full credit. In part (f), only just over a quarter of candidates gained any credit. A number of candidates just responded with "no" and ignored the instruction to "explain carefully ... and give some numbers to support your answer"; these gained no credit. In part (g)(i), the majority of candidates were successful. There was the odd transcription error or truncated number. In part (g)(ii), a small minority were able to answer the question correctly. As might be expected the lowest ability candidates found this question particularly challenging.

8 The whole of Question 8 was found challenging by all candidates with only a small minority gaining any credit at all. Almost one in ten candidates did not attempt the question. In part (a)(i), only a very small minority of candidates were able to set up the appropriate algebraic expression. A significant number merely wrote algebraic expressions. In part (a)(ii), almost no candidates succeeded in finding an expression for the perimeter of the rug. In part (b), the very small minority who gained credit for the correct answer did so mainly by trial and improvement with "5 m by 4 m" being the common wrong answer.

A381/02 Applications of Mathematics 1 (Higher Tier)

General Comments

Overall the standard was variable with a significant number of poor papers and some very good papers, with the majority scoring marks in the range 10 to 45. At the top end, it was encouraging to see candidates coping with content of a higher demand and displaying an excellent knowledge of the topics and showing full and accurate working throughout. However, at the lower end, some candidates were clearly unable to cope with the demands of a higher level paper and working was often unclear making it difficult to award method marks. The level of algebra seen varied considerably with many using trial and improvement to solve equations. Presentation of work was generally good with clear working shown although answers requiring reasons or an explanation of the mathematics were less well answered. At this level, candidates should be reading questions carefully, checking their work to identify where errors have been made and making sure their answer is reasonable in the context of the question.

There was no evidence that candidates were short of time on this paper although weaker candidates left some questions unanswered.

Comments on Individual Questions

1 A majority of candidates were able to earn both marks with many showing intermediate steps in their calculation. Some clearly attempted the calculation as a whole and the omission of brackets around the numerator and/or the denominator was a common cause of error. Some candidates with these errors earned a mark for correctly rounding their wrong answer to one decimal place.

2 A large majority of candidates earned at least two marks for this equation. Many were able to expand the brackets correctly but collecting terms proved to be problematic and $6x = 5$ was a common error at this stage. These candidates were able to pick up the final mark for solving this equation but an answer of 1.2 was a common error. Common errors in expanding the brackets included –1 and +4 not being multiplied and occasionally –2 being multiplied by 3. However, these candidates were able to earn two marks for satisfactorily solving the equation following this error. A significant number of attempts at trial and improvement failed to produce the correct solution and so earned no marks.

3 In part (a), most candidates were able to identify the correct congruent triangle. A common error was to pick D, the similar triangle, and occasionally B. In part (b), candidates were less successful in identifying the similar triangle. If wrong it was usually E or B that was picked. In part (c) a small minority used the grid to fit the triangles together to make the square, some tried but could not complete it successfully. Others summed the areas of the triangles and square rooted. A significant number gave the correct answer without any working. In practice it was usually 0 or 3 marks that were awarded.

4 A small minority of candidates rounded correctly and evaluated a valid estimate. Others tried but experienced difficulty with the cube root of 60 which was often given as 20 and some rounded 289.4 to two significant figures. It was evident that a minority of candidates had not read the question carefully as no attempt was made to write the numbers to one significant figure. Many of these simply used a calculator and then rounded the answer.

5 In part (a), most candidates earned both marks on this part of the question. Slightly more used multiplication by 1.15, or its fraction equivalent, than calculated 15% and then added it on. The second method led to the occasional error when adding on to the previous value. Some of the weaker candidates attempted to find 10% followed by 5%. In part (b), only a small minority were able to deal with the reverse percentage calculation and earn both marks. Many of the others used the incorrect method of finding 8% and then subtracting with slightly fewer adding on the percentage. Candidates should be encouraged to check that their answers are reasonable in the context of the question.

6 In part (a)(i), only a minority of candidates appreciated that the width of the border would appear twice in their answer. A common wrong answer was $7 - x$. In part (a)(ii), only a small minority picked up both marks for obtaining and simplifying an expression for the perimeter. Some with the correct answer in the first part of the question went on to ignore their answer and instead used $7 - x$ and $5 - x$. Some candidates used their expressions for length and width once only. Many of the incorrect simplifications involve terms in x^2. In part (b), only a minority of the candidates with an expression for the perimeter went on to set up an equation and solve it. Many of the others attempted to use trial and improvement or simply gave an answer without any working. Some of these were correct but 5m by 4m was a common incorrect answer.

7 The modal mark on this question was 2, most commonly for obtaining a mass and a volume in the correct ranges. Some candidates went on to calculate an estimate for the density but in many of these cases no units were given or they were often incorrect. Other common errors included misreads of the mass or volume and applying the wrong operation, usually multiplication, to evaluate the density.

8 Good responses involved clear labelling of the sides and angles needed to evaluate the area of the triangle, followed by the appropriate calculation. In most cases the calculation involved ½ × base × height and in a small number of cases $\frac{1}{2}ab\sin C$. Most measurements that were shown were usually within allowed tolerances. The most common error was to measure all three sides and then use one of these as the height – this earned no marks. Overall, a large majority made no attempt, gave inappropriate or inaccurate measurements or used an incorrect method.

9 Good responses involved consideration of more than one square number greater than 100. The most common approach was to find $\frac{5}{8}$ of a number, $\frac{1}{4}$ of the same number, add the results and subtract from the original number. Overall a large majority were able to earn at least two marks. Using 121 as the square number was a common error as was using 100 or numbers that were not square numbers. Some candidates attempted to add the two fractions and subtract from 1 to find the proportion that were boys. This sometimes led to the error $\frac{5}{8} + \frac{1}{4} = \frac{6}{12}$. Many of the answers simply involved a series of calculations which would have benefited from some wording to explain their calculations.

10 In part (a), only a few candidates were able to set up an equation linking *L* and *M*. For those that could, the majority were able to go on and evaluate the constant of proportionality to complete the equation. Many incorrect responses involved direct proportion. In part (b), many of those with the correct formula in part (a) correctly calculated the petrol consumption in this part.

11 This question also tested the quality of written communication. Many of the better responses set out the angles used with clear unambiguous reasons given at each step. For these candidates the use of three letters to define an angle presented no problem. However, many other candidates used single letters or incorrect combinations of three letters and this made the working very difficult to follow. Others simply described the method used rather than give reasons at each stage. Some simply stated a list of reasons separately from the angles making it impossible to know which reason went with which angle. The use of terms such as 'Z angles' and 'F angles' were unacceptable for full marks. A small number were able to calculate angle FGC but could not explain their method. An answer of 105 was a common error usually accompanied by reasons such as 'opposite angles' or 'corresponding angles'.

12(a) In part (a), most candidates obtained the correct answer. Calculating 500 ÷ 1.16 was the common error. In part (b)(i), a few candidates earned all four marks with solutions that were clearly set out with working shown. Many of the others showed some but not all of their working. For these candidates it was difficult to award method marks when errors occurred. Some showed the calculations such as 548 ÷ 120 but did not show the decimal answer instead giving a time in hours and minutes that was incorrect. Some gave the incorrect times without the calculations. A small number preferred to calculate the time taken to complete one kilometre and use this to calculate the journey times. Premature approximation, or truncation, of the answers caused many to lose a mark. For example, 548 ÷ 120 = 4.5 hours was fairly common. Many of those who earned three marks lost the final mark by failing to convert their time correctly to minutes and 8.91 hours = 9h 31 minutes was very common. In part (b)(ii), a minority were able to set out their calculations clearly and correctly and earn all four marks. Again, some candidates were reluctant to show all working and premature approximation caused problems again. Despite having the use of a calculator many did not attempt calculations such as 548 ÷ 100 × 11.3. Instead they would employ a method of repeated addition to work out the number of litres for 500km and then estimate the amount required for 48km. Others rounded the distances to 300 and 500 or 400 and 600. Some missed the significance of litres per 100km and treated it as litres per km and obtained answers in the thousands. This was another question where candidates might have benefitted from checking that their answers were reasonable in the context of the question.

13 In part (a)(i), only a small minority were able to give the correct answer. Common wrong answers included 5^1 and 1^5. In part (a)(ii), fewer candidates achieved success when compared with part (i). The two most common wrong answers were $\left(\frac{1}{25}\right)^5$ and $5^{\frac{1}{25}}$. In part (b), a majority of candidates knew what to do and went on to earn both marks. It was an extremely rare event to award a mark for a partially correct answer. Common wrong answers included 17½ and sometimes 24.

14 Only the most able were able to set up a pair of simultaneous equations and make headway in their attempt to solve them with the result that few were awarded full marks. A wide variety of starting points was seen but only a minority were able to set up at least one equation. Several of those with two equations made errors when collecting terms. Many employed the use of trial and improvement either from the start or in solving their two equations, almost always without success. A common incorrect starting point was to assume that opposite angles added to 180°.

A382/01 Applications of Mathematics 2 (Foundation Tier)

General Comments

Entries for this unit were made by just one centre and candidates' performance was good.

Examiners were pleased to note that the question assessing quality of written communication (QWC) was answered confidently by the majority of candidates. It was particularly pleasing to note the number of good solutions in this question where candidates used text to explain what they were doing in their calculations. These candidates showed that they were very aware of the need to show full working and solutions in this QWC question and throughout the paper.

Examiners felt that many candidates were familiar with the contexts in which the questions were set. Candidates showed that they could apply methods of mathematical working that they had learned in a variety of real-life contexts and situations.

Comments on Individual Questions

1 Most candidates found this question to be straightforward and scored highly. However some candidates did not understand what was required for part (c) and a few candidates left their answer as $3\frac{3}{4}$ pence without realising that 'to the nearest p' was asked for.

2 The great majority of candidates answered this question extremely well. The only error seen was to reverse their coordinates.

3 In general this question was answered well with candidates showing all steps in their working. A good variety of methods were seen to arrive at the correct answer.

4 Many candidates scored full marks on this question. They seemed familiar with the context of the UK map and usually arrived at sensible and relevant explanations, especially in part (a)(ii).

5 Examiners were pleased to see candidates could generally apply their knowledge of graph plotting to an unfamiliar setting. In part (a) 1591 was a common error – it being the *y*-coordinate for Islamic Year 1000.

6 Almost all candidates scored full marks on this question. It was pleasing to see that candidates were very aware of how tins are stacked and the link with volume. Candidates were highly successful in finding factor pairs of 60.

7 The majority of candidates were able to obtain virtually all the marks on part (a). Nearly all managed to use the information in the bar chart to complete the pie chart. Best answers also showed clear and accurate labelling of the pie chart. In part (b) candidates need to be aware that a pie chart shows proportions and not the actual number of, in this case, birds seen at the bird table.

8 It was clear that many candidates have excellent knowledge of grid references and they used their knowledge to good effect with many perfect answers seen. In part (d) it was pleasing to see candidates using their estimating skills even though some forgot to round their answer appropriately as requested.

9 Part (a) was successfully answered by most candidates despite the long lead in to the question. Examiners were highly impressed by the work of candidates who used words to explain carefully what they were about to work out. These candidates showed they could clearly communicate their method. Most candidates usually got as far as finding the saving in buying the new energy-saving bulbs as opposed to the old bulbs. The best answers then went on further to factor in the cost of buying the energy-saving bulbs as part of the overall saving for the Lee family. Weaker responses merely worked out the cost of using either type of bulb or both bulbs with errors in their calculations. Such responses did gain partial credit.

10 All candidates made an attempt at this question with encouraging levels of success. It was clear that most candidates had a good level of understanding of probability and how it applies when using a spinner.

11 Candidates usually tackled this from an area perspective rather than seeing how many tiles could fit along each side of the square board. Those candidates did have access to part marks. Best answers worked out how many times the length and width of the tile could fit in the square and some candidates then realised that their number of tiles across had to be an integer.

12 Some candidates worked through this question ignoring the fact that each fence panel was 2 metres long – such responses usually did gain part marks. A majority of candidates did manage to use Pythagoras' Theorem to find the correct length of the diagonal path.

13 Most candidates managed to find the statistical measures from the stem and leaf table in part (a). In part (b) candidates should be aware that their comparisons should be about the spread, range or distribution of times as well as comparing the median times as a representative average. Candidates did not score if they simply referenced either the slowest or the fastest swimmer.

14 Examiners were very impressed with the ingenuity used by many candidates to think of situations where this algebraic situation could occur. A few candidates forgot to define their n but overall candidates did really well on this question.

15 Candidates dealt confidently with this time-graph question. Some forgot to include the initial part of the journey. Lots of accurate answers, usually involving the word steepest, were seen in part (c).

16 This question tested candidates' knowledge of monetary conversions. Many excellent and carefully constructed solutions were seen to the delight of examiners. Some students tried to multiply by the exchange rates rather than dividing. If candidates managed to multiply consistently then partial credit was given. Best answers seen were written by candidates who gave their values to the nearest cent rather than with many decimal places.

17 Many candidates showed they had a sound method for working out a mean value and then showed they knew what effect the new assistant managers would have on the average value and how it would then attract new employees.

18 In part (a) candidates often tried to find multipliers without fully understanding what effect this would have on how much concrete mix could be made. A pleasing number of correct solutions were seen in part (b) with candidates showing that they knew that they had to find the area of the shed first and further that depth equals volume divided by area. Examiners were pleased to see such thought in candidates' answers.

A382/02 Applications of Mathematics 2 (Higher Tier)

General Comments

Entries for this unit were made by just one centre. Examiners were pleased to note that the question assessing quality of written communication (QWC) was answered confidently by the majority of candidates.

However, examiners felt that many candidates were not familiar with all the 'new' topics in the applications specifications. Furthermore examiners felt that a significant number of candidates did not have the knowledge and skills to respond to questions in the higher tier specification and should not have been entered at this level in this series. In particular, the trigonometry question and the locus question produced very poor responses. For some candidates the Foundation tier would have been a more appropriate examination and much less of a negative experience.

Comments on Individual Questions

1 Most candidates found this question to be straightforward. To gain the marks in part (b)(ii) it should be emphasised to candidates that examiners are looking for comparisons between summary values for statistical data, such as median and range, and not comparisons between individual values. In part (b)(iii) the best answers considered all the data giving an interpretation of possible scenarios before and after training.

2 The majority of candidates answered this question well.

3 This question was answered well with candidates showing all steps in their working. Good responses saw candidates aware that calculations involving money had solutions given appropriately for the context, to the nearest pence.

4 Parts (a), (b) and (d) of this question were answered well. Common errors in part (c) included using the upper bound, rather than midpoints, or a division of estimated total frequency by 4.

5 In part (a), good responses showed an appreciation that the quantities given in the question were the maximum available and these needed to be used in conjunction with the given ratio.

In part (b), candidates used trial and improvement or did not show any working. Answers very different from the acceptable range suggested that candidates did not account for the sizes of lengths given in metres and/or consider the appropriateness of their solution with respect to the information given in the question.

6 There were many excellent responses with full working and solutions in this QWC question.

7 This question differentiated well. To get all the marks candidates needed to calculate and state the function value for the x value being trialled and give an answer to the required degree of accuracy, clearly showing an answer just above or just below would not be correct.

8 This question required candidates to have an understanding of basic trigonometry.

9 This question produced a wide range of answers. Candidates were able to interpret both the table in part (b) and the graph in part (e)(i) with greater confidence than the graph in part (a). Finding probabilities was answered well. Interpretation of probability with reference to the graph was a challenging question.

10 It was necessary to use a pair of compasses to gain full marks in this question.

11 Part (a) and part (b) caused no difficulties. To get the marks in part (c) candidates needed to identify the lines to draw.

12 This question differentiated well. Good responses successfully used the formula for area of a trapezium, given in the formula sheet on page 2, to calculate an estimate of the required area.

13 This was a challenging question. Candidates needed to recognise that Pythagoras' theorem was needed to find the lengths of cable. Some candidates approached the question using trial and improvement of a point for F, and marks were given for this. Where candidates did not achieve higher marks it was usually because they did not answer the question set.

14 It was clear that the majority of candidates have little understanding of this topic. The context of this question was 'new' and required candidates to have an understanding of routine compound interest calculations.

15 This question required candidates to have an understanding of histograms.

16 Part (a) caused no difficulties. Part (b) produced a wide range of answers. Good responses sometimes made use of the graph to find the answer.

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