GCSE

Applications of Mathematics (Pilot)

General Certificate of Secondary Education **J925**

OCR Report to Centres June 2014

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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A381/01 Foundation Tier

General Comments:

The great majority of candidates possessed the necessary knowledge and skills and were able to show what they could achieve. It was felt that candidates are becoming marginally more confident handling multi-step questions, including those designated as assessing QWC (quality of written communication).

The literacy demands of the paper did not have an obvious negative effect on any candidates. Presentation and clarity of number work was at least satisfactory. Intelligibility of working is especially important as follow through and method marks may only be awarded on the written evidence presented to the examiner.

Comments on Individual Questions:

Question No.1

(a) **(i)** Although the majority were successful, a noticeable number of candidates were insecure naming parts of a circle. This was evidenced by common wrong responses of “8” and “16” metres for the radius of the helipad. There were also attempts to find the circumference, as demonstrated by responses of “25.12 ...” and “12.56 ...”.

(ii) This was found challenging compared with similar questions in the past – errors tended to be “out” by at least an order of magnitude, suggesting wild guesses.

(b) **(i)** Almost three quarters of candidates gained full credit. Transposition errors tended to be very rare with most errors arising from careless/inaccurate scale reading. In many cases one abscissa was correctly indicated.

(ii) Transposition again particularly rare; overall a large majority of candidates gained full credit, with only a relatively small number plotting the point inaccurately. An unambiguous indication of the point was deemed an adequate response.

(iii) Most gained partial credit for drawing a line linking Bishop’s Rock and Round Island. There were very few instances of the supplementary angle being given as the answer, although a small but noticeable proportion used the complementary angle (40° to 45°). Some obviously confused bearings with compass directions. Only a small minority gained full credit.

(c) **(i)** Just over half of all candidates were successful here.

(ii) The most common error was “45 seconds”, resulting from the sum of the three given times. Nevertheless some good methods were seen, including the systematic listing of times for each lighthouse flash. About one third gained full credit, but just over a quarter of candidates failed to attempt this item.

(d) **(i)** Although the majority were successful over one third failed to gain credit with 600 being the most common wrong response - the result of “300 x 2” rather than “300 ÷ 2”.

(ii) Although most were successful the question attracted some outlandish responses; a significant number lost credit by failing to realise that a whole number answer was required.

(iii) Follow through was available from the two previous responses and a number of candidates availed themselves of this. Disregarding the square root, as might have been foreseen, was a popular error. Occasionally the "3.8×" was taken to operate within the square root.

Question No.2

(a) Well done by a very large majority; there was no logical pattern in the errors, although "12 and 8" were noted on several occasions. One of the most accessible items on the paper and throughout the ability range.

(b) **(i)** Very well done. "1.2" was a common error, probably from "4.2 − 3.4" calculated as the difference between individual digits.

(ii) The most common error was "week 3 and week 4", although just one of the correct weeks given was not uncommon. However, over three quarters of candidates were successful.

(iii) A significant number of answers did not quote numbers from the table – despite the rubric. Nevertheless the majority did gain full credit.

(c) Partial credit was given for "32" and a number of candidates gained this. The most common errors were "4" (from 64÷16?) and "8" (from the square root of 64?). Over two thirds gained at least partial credit.

(d) Many, but not all, candidates were able to make an initial start, but the unstructured nature of the problem proved too great a challenge for many. However from the evidence it appeared that most candidates recalled the basic time facts. A number of candidates wrongly assumed that the question involved halving after each audition (as for shows in the previous part question). Partial credit was available in such cases.

Question No.3

(a) Quite well answered, a "strict" follow through mark was available for the correct area attached to the relevant shape.

(b) Although three quarters were successful a significant number did not apparently realise that more than one response was required – many wrote just one.

(c) The same general comment applies as to part (b), but in this part question the majority gained no credit, making this one of the most challenging items on the paper.

(d) Just over three quarters gained full credit. Sometimes the second shape was omitted. This item was found more accessible than the previous two.

(e) There was some evidence of measuring and/or guessing. A follow through mark was available for the second angle, but instances of full credit were care. Angles of 45° were a not uncommon response to part (ii). About two thirds of candidates were successful in part (i), but this dropped to just over a third for part (ii).

Question No.4

(a) (i) A well answered item, almost all candidates were correct. It was found accessible throughout the capability range.

(ii) This was well answered, one of the most accessible (throughout the capability range) items on the paper. There were no literacy problems involving the mountain names.

(iii) Well answered with common incorrect responses of 9 and 99. A large majority gained full credit, one of the most accessible items on the paper.

(iv) Several different successful approaches employed including "calculating 5 miles as 8000 metres" and converting each metric mountain height into miles. This item attracted some well written responses. In order to gain full credit candidates had to "Show clearly how you arrived at your answer", this was not always the case.

(v) Some quite thoughtful and valid reasons given, set against a majority of some rather strange and incorrect ones. Found challenging with some two thirds failing to gain credit.

(vi) Many gained partial credit with responses involving the figure 2, but a third gained no credit. This was somewhat surprising given the moderately direct nature of this "rate" question.

(b) A large majority gained at least partial credit, 150 was a very common wrong response. This probably originated from merely subtracting the two dial readings, when this was clearly the case supported by working partial credit was given. Many candidates seemed to attempt the question in their heads thereby failing to arrive at the correct response.

(c) (i) A well done item with two thirds gaining full credit. Most errors originated in candidates' inability to understand brackets. However judging by the lack of actual working in a noticeable number of cases some candidates were obviously making effective use of the bracket facilities on their calculators.

(ii) Follow through was available and quite a few gained this for correct rounding.

(d) (i) Well done across the capability range, overwhelmingly so, the best responded to item on the paper.

(ii) Well done by a large majority, the most common incorrect response was "-16".

(e) (i) The rules of indices proved too great a challenge for the majority. Less than one in ten were successful. The most common wrong responses were "6" and "54". The latter was probably the result of "3 × 18". This part question was the least well responded to on the paper.

(ii) Surprisingly somewhat better answered than part (i) with almost a quarter of candidates gaining credit, but with about one in five candidates failing to attempt it.

(iii) A few correct responses, slightly more than one in ten, with a number of candidates gaining partial credit for “10 000”. This was one of the least accessible part questions on the paper and was omitted by one third of all candidates.

(f) Quite well done, “-14” was a common error, but partial credit was available for evidence of “800 ÷ 200”.

Question No.5

(a) **(i)** Some very poor measurements also reading from the actual sketch as evidenced by responses of 5 and 4 or 3 was not uncommon. Although penalised here these measurements were followed through for the rest of the question.

(ii) A full follow through from part (i) was available. Somewhat disappointingly only a minority were able to perform the centimetres to metres conversion required here, in fact a significant number performed the conversion the “wrong way round” – assuming there to be 10 or 100 metres in a centimetre or even in a noticeable number of cases a “1 to 1” correspondence.

(b) This attracted a very high omission rate of almost one in four and was one of the most challenging items on the paper. There was a great deal of misunderstanding regarding perimeter and area i.e. summing two or more lengths then multiplying the answer by 80 or squaring each individual dimension. Another common error was to “÷ 80” rather than “× 80” possibly the result of seeing “... that weighs 80 g a square metre”.

A381/02 Higher Tier

General Comments

There was no evidence to suggest that candidates were short of time on this paper with most candidates attempting the vast majority of questions. Yet again, many candidates were well prepared for this exam and, in general, performed to a pleasing standard with most gaining a mark in the range 25 to 55. Presentation of written work was disappointing with working that was often haphazard and difficult to follow, making it difficult to award method marks when the answer was incorrect. One disappointing feature of the working was the need for candidates to use inefficient mental processes for questions involving percentages. Yet again this year, some candidates lost marks for incorrect final answers following premature approximation of values in the working.

Comments on Individual Questions

1 Several methods were seen in part (a) with a majority of candidates gaining at least one mark. Those using the cost per ml were generally successful. Some compared the costs of a fixed volume of wine, usually 750ml. This often led to the 175ml glass only being compared to the bottle and hence marks were lost. Others attempted to use a constant of proportionality but were rarely able to use it correctly to gain the marks. Candidates were generally more successful in part (b) and many gained a minimum of two marks. Premature rounding such as $19.50 \div 750 = 0.03$, $750 \div 175 = 4.29$ or 4.3 led to inaccurate answers for one or more of the glasses. A small number lost a mark for incorrect notation by writing 6.5 for the large glass.

2 In part (a)(i) only just over half gained the mark for the correct power of 10. An extremely common wrong answer was 54. Part (ii) proved less of a challenge and most candidates were successful. Having two operations to contend with in part (iii) resulted in more errors and only a minority gained both marks. Many of the rest gained one mark for reaching 10 000m, but either did not, or could not, change this into kilometres successfully.

In part (b)(i) most candidates gained both marks, although a few, following a correct substitution, changed the 18 to 20 and lost the final mark. These had probably read the word ‘estimate’ and rounded the 18 up to 20, not fully appreciating that the formula given was for estimating the temperature. Just over half the candidates were able to calculate the height of the mountain in part (ii). Many of the others were able to earn one mark for substituting into the formula but all too often rearranged it incorrectly, usually as a result of multiplying incorrectly by 200. In part (iii) a majority of responses earned both marks. Few candidates realised that for every 200m ascended the temperature dropped by one degree and 9×200 was rarely seen. Most preferred a trial and improvement method by choosing two temperatures differing by 9°. For some this produced two temperatures differing by 8, such as 1 and 9 or –1 and 7. Many of those that substituted two temperatures into the formula lost marks when rearranging the formula.

3 Part (a) was answered well by most candidates. Any errors were usually a result of 0.18×1000 incorrectly calculated. Both parts (b)(i) and (ii) were answered well with only the occasional slip resulting in a loss of marks. Part (iii) was also testing the communication skills of candidates and it was expected that candidates would show their annotated calculations. Few gained all four marks, largely due to a lack of annotation and the failure to show some of their calculations. It was disappointing to see so many candidates attempting 80% of 215 (or other possible values) by listing values such as 50%, 10%, 5% and 1% rather than use the simple multiplier of 0.8. A small number gave the total revenue, forgetting that the profit was required. In part (c) a majority of candidates gained all three marks by showing a clearly laid out solution. Yet again, a significant minority displayed a lack of understanding of percentages, trialling a variety of percentages of £51.56 to get as close as possible to £27.56. These attempts ended in failure as answers were never in the acceptable range to award the marks. Most of these candidates did gain a mark for the cost of the taxi.

4 A bearing was required in both parts of part (a). In part (i) a majority obtained the correct (acute) bearing but in part (ii), where the bearing was reflex, only a minority gained the mark. In part (b)(i) the majority of candidates correctly multiplied the speed by the time to obtain the distance but many of those with an incorrect answer calculated $26 \div 1.5$ or, to a lesser extent, 26×90. Almost all of those with a correct answer went on to calculate the correct scale in part (ii). Part (iii) provided a good spread of marks, the modal score being 5. Common errors in this part included using 39 miles, or the distance AL, as the flight distance for the helicopter, measuring the distance AB incorrectly and using an incorrect formula to calculate the speed. For some candidates, working was often haphazard, making it difficult to award marks when the final answer was incorrect.

5 Better candidates found this question relatively straightforward and most scored full marks. The same could not be said for weaker candidates, many of them multiplying £113.40 by 36. Several calculated $1000 \div 36$ and rounded this to 27.7, 27.8 or 28 which led to an inaccurate final answer. Part (ii) proved far more challenging and it was clear that many did not have a clear understanding of density. A majority of candidates either made no attempt or could make no progress and scored no marks. It was common to see calculations such as 36×8.92 and $8.92 \div 36$ and others, where a change of units had been carried out incorrectly. At this level it is expected that candidates know that there are 1000g in a kilogram. Candidates fared better in part (b) and a majority gained all three marks. Most attempted this by repeatedly calculating 6% of the value and adding it on, far more than using a multiplier of 1.06, sometimes given as 1.6. A significant number counted the months as 4, including September as a monthly increase. Others treated this in the same way as simple interest and others failed to round their final answer to the nearest penny.

6 In part (a) roughly equal numbers scored two marks as scored one mark. Many were able to evaluate the given calculation but many of these failed to give their answer correct to three significant figures. Other incorrect answers included 1420.0 and 142. Only a few evaluated the calculation incorrectly and then went on to give their answer correct to three sig. figs. As has been the case in previous years candidates still struggle to come to grips with areas and volumes of similar objects. Only the strongest candidates gained all three marks. Some of the others picked up a method mark for working correctly with a wrong linear ratio.

7 In part (a)(i) a small majority appreciated the need to use LCM or work with multiples of the given dimensions and had no trouble in gaining all three marks. Anyone not working with multiples or factors usually scored no marks. Some simplified 5, 10 and 18 and took the cube root of the result. Candidates were only slightly less successful on this part of the question, some dividing 90 by the dimensions of one packet and finding the product. Others simply worked with the volume of the box and the volume of a packet. Part (b) produced a fairly even spread of the marks available. Some opted to work with the volume of 48 packets and come up with dimensions that gave this volume. Some realised that one dimension had to be 36 and with some trial and improvement attempted to find the last two dimensions. Throughout the question many candidates had numerous calculations and figures dotted around the working space, making it difficult to award method marks when the final answer was incorrect.

A382/01 Foundation Tier

General Comments:

The candidates who sat this paper were largely well prepared and were able to demonstrate their skills in computation, reading and interpreting charts and situations and then make general statements based on sound reasoning and evidence. In this session there was a further improvement in the way candidates were recording both their working out and their calculations. Best practice included showing a calculation to justify an answer. Candidates clearly made good use of their calculators but understood that answers alone are seldom acceptable in real life situations. An increasing number of candidates managed to demonstrate their understanding of using formulas, using averages for comparisons and explaining their assumptions as part of their work.

Comments on Individual Questions:

Question No.1

In part (a) there were a lot of fully correct answers. Candidates with errors usually added the three lengths but could still score the second method mark for dividing their volume by 3.

Candidates were largely successful in reading from the graph in part (b) though a few candidates thought 4 minutes 30 seconds would become 4.30 minutes when expressed in decimals.

In part (c) there was a considerable amount of correct answers though some candidates thought that 'to the power of 4' was the same as 'multiplying by 4'. Full marks were available to them in part (ii). Best answers to this part were where students wrote down their calculation rather than simply writing down their calculator value. Candidates are always encouraged to show their working and those who did were rewarded even if their actual answer was incorrect. In part (iii) it was pleasing to see more candidates stating their assumed weight of an average adult and this again was key to seeing correct answers and the awarding of full marks.

In part d (ii) there were improvements in the way candidates were able to accurately use the graph to support their argument. They usually managed to use at least one value from the graph as evidence. There was greater sophistication in the way they expressed their thoughts which again showed a healthy level of understanding of what the graph was actually showing.

Part (e) was again a source of good answers with virtually all candidates realising that they needed two causes to sum to 25%. An impressive number of candidates could also spot the link between matches and candles on the pie chart and correctly discover how many accidents were caused by candles each year.

Candidates tended to find part (f) challenging. The stumbling block was a failure to appreciate the fact that the solution had to be made with <u>both</u> concentrate <u>and</u> water and that therefore a multiplier of 25 was required rather than 24. Part (ii) required candidates to convert between two metric units, work out the volume of foam generated by one fire engine and then compare the two measures. Only a small proportion of candidates managed a full correct answer here with part marks usually being awarded for correctly converting 5250m^3 into 5 250 000 litres.

The majority of candidates were successful in finding an estimated area of forest. Best answers were exemplified by either counting on the picture and then by multiplying their value by 4 or by counting in 4s on the picture. A few candidates simply counted the squares on the whole grid rather than focusing on the forest fire area as the question indicated. The vast majority of candidates found the 1.5 hours in part (ii) though again a few answers of 1.30 were seen – presumably from a 'one hour 30 minutes' approach.

Question No.2

Candidates generally were comfortable with the context of cranes on building sites. In part (a) they were largely successful in accurately measuring the maximum reach and then multiplying it by 10. A few candidates thought that 7.2 x 10 was 70.2 despite candidates all being encouraged to use a calculator. There was less success in identifying A as representative of the height of an average man.

A pleasing number of fully correct answers were seen in part (b) with accurate constructions using a pair of compasses. Most candidates could correctly identify the intersection of their three circles in part (ii) though the construction of the perpendicular bisector required in part (iii) was only achieved by the stronger candidates. The most common error was to either identify the pipe by a dot or to physically draw a short pipe within the intersection of the two given circles.

An encouraging number of correct answers were seen in part (c) though there were a small number of candidates who tried to express the views using the letters X, Y and Z. Candidates who did use the right pictures for the views in the wrong way usually mixed up direction X with direction Z. Such candidates managed to score 1 mark out of 3.

In part (d) candidates were better at identifying the correct inequalities than in previous exam sessions. Some candidates only identified one inequality despite there being two marks available.

There were some good responses in part (e). A good percentage of candidates managed to find a correct percentage for the probability and they usually gave this fraction in simplest terms even though this was not required for the marks. Candidates were usually able to turn their fraction into a decimal even if sometimes they prematurely rounded it. In part (ii) candidates were expected to find the expected loss by multiplying their probability by £100,000 and then comparing this to the cost of purchasing the crane for £20,000. Only a small proportion of candidates were successful in this. A minority of candidates considered the likely costs across a multitude of years – usually a multiple of 20; these candidates did have access to full marks. Most candidates talked about how likely their probability was and used this to influence their decision with no reference to likely costs. Such candidates often gained the one mark available for considering the relative likelihood of their probability.

Question No.3

Candidates seemed to enjoy the athletics context here and they used their knowledge to use a formula correctly and then make the correct conclusion as to whether the suggested formula was valid or not in part (b). The rearranging of this formula in part b (ii) proved much more problematic with only the strongest of candidates correctly making *h* the subject of the formula. In part (c) some candidates erroneously failed to take note of the fact that they had to reference to the total time even though it was in bold in the question. Such candidates often did manage to reduce their $\frac{80}{160}$ into its lowest terms of $\frac{1}{2}$. It was very pleasing to see that almost all of the candidates who did correctly identify $\frac{80}{240}$ then went on to simplify it to $\frac{1}{3}$.

In part (d) most candidates failed to incorporate the fact that they needed to use 45 strides so that a multiplication of 45 were usually omitted. Such candidates could only score 1 mark for making the correct conclusion about the world record by comparing the new time with the 9.58 seconds. A small number of candidates simply found 10% of 80 milliseconds and then said he would break the record. Best answers were typified by multiplying the 45 by 8 milliseconds and then subtracting this from 9.90 seconds to get 9.54 seconds which would see Marvin break the world record.

Most candidates managed to read off the correct speed in part (i) though virtually all the other wrong values were seen. Part (ii) required careful examining of the speeds in the table and very few candidates were able to correctly identify the $60 < d \leq 80$ section for the biggest improvement from Barcelona to Berlin. The best answers in part (iii) mentioned the fact that in Barcelona the speeds began to slow in the $60 < d \leq 80$ section whereas it was the $80 < d \leq 100$ section where slowing down occurred for Berlin.

Question No.4

Parts (a) and (b) were generally answered well and candidates often came up with good reasons why a telephone survey would or would not be a good idea. The advantages usually mentioned the speed and ease of doing the survey. The disadvantages often spoke about people not answering the phone, putting the phone down or technical issues such as a poor phone line.

Candidates were fairly happy with part (c) though a few misread the scale and wrote 530 rather than the correct answer of 560. A large variety of correct observations were seen in part (iii) indicating that candidates can make general statements from given data.

In part (d) it was hoped that candidates would realise that collecting numerical data would be beneficial for processing such as finding averages which would be useful for comparison purposes. Only a small number of candidates alluded to this in their response.

There was a healthy level of success in part (e), where candidates did show their impressive knowledge of how to calculate a mean, mode, median and range and then make comparisons across two age ranges. Finding the median usually proved to be a big challenge – candidates often managed to find the middle pair of values as a 7 and an 8 but failed to correctly state that the median was 7.5. Virtually all candidates gained some marks in part e (ii). Part (iii) was done very well; the best answers referenced both the mean and median in deciding which age group was happier. A small minority of candidates had all the correct statistics at their fingertips but then made the wrong conclusions.

The vast majority of candidates managed to add their points to the scatter diagram though some made errors, usually with the point (38, 7.1). In the last part candidates often gave a generic word description of positive correlation rather than using the word ‘positive. Very few candidates talked about the strength of the correlation despite the word “fully” being included in the question.

Question No.5

In part (a) some candidates chose to consider only the basic price of the two fuel types which was the intended approach. Others found the cost of various amounts of both petrol and LPG and they were given full credit if their values were accurately worked out with the correct conclusion. Some candidates did lots of excellent working out but were then denied the mark as they did not answer the question as to whether the headline was correct.

Some candidates scored full marks in part (b) by correctly working out the typical amount of LPG used in a week and by then correctly working out what his petrol expenditure would have been, followed by his expected saving. It was pleasing again to see candidates who wrote down all their steps of working here rather than simply stating a final answer which may or may not have been correct. Some candidates failed to realise that Josh would be using the 10% increased litres of LPG and their marks were restricted by this. Candidates who showed their calculation in part (iii) were rewarded and the need to round up for the number of weeks was appreciated by a good number of candidates.

In part (c) the vertical scale not starting at 0 was seldom noted by candidates.

A good proportion of candidates could work out a fraction of an amount in part (d). Once again, a pleasing number of calculations were written down rather just giving the final answer.

A382/02 Higher Tier

General Comments:

There was no evidence to suggest that candidates had insufficient time to complete the paper. Only a small number of candidates did not demonstrate the knowledge and skills required for the demand of a higher tier specification. In general graphical work was good.

Use of calculators was evident throughout, but candidates need to be aware of the need to show the calculations they are performing on the calculator. This was particularly important in Q1(e), Q1(f)(ii) and Q5(a)(ii). Method marks cannot be gained for a final answer that is incorrect where the calculation is not written down. It is even more problematic when numbers simply appear, without evidence, and are used in subsequent calculations, see in particular Q5(b)(iii), Q6(b), Q6(d) and Q7(c).

Additionally, it is difficult for examiners to follow calculations presented in a haphazard fashion. Methodical working, clearly set out, adds to the demonstration of candidate's mathematical knowledge and understanding and allows candidates to gain marks where they have not managed to reach a fully correct solution.

Finally candidates should consider whether or not both their final answers and/or steps in the working are sensible with respect to the context of the question, see particularly Q1(b).

Answers to questions requiring mathematical justification could be improved. Clarity of explanation was often poor and sometimes ambiguous. 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 with a brief explanation, but is unlikely to be just a paragraph of random thoughts. Too often responses to these types of questions just quoted results of new calculations; candidates need to also show the actual calculation as part of their explanation.

Comments on Individual Questions:

Question No.1

Q1(a) was in general answered well with most candidates attempting to find the volumes of two cuboids then adding. A significant minority made arithmetical errors in calculating the missing length.

The majority of candidates scored at least 3 marks in Q1(b) and did use calculations appropriately. Where a mark was lost it was often for a lack of consideration of the suitability of dimensions such as giving one of the lengths as 100cm, highly impractical for portability of a fuel can.

A very high proportion of candidates scored full marks in Q1(c)(i), Q1(c)(ii) and Q1(d)(i). There were many excellent solutions in Q1(d)(ii), however a significant number of candidates chose to subtract £270 from £510, giving £240 as the answer.

Many candidates gave figures to support their explanation in Q1(e), but a significant number chose not to show how their figures had been derived. Candidates should be aware that in mathematics papers questions involving an explanation will often require full calculations to be seen as part of that explanation.

In Q1(f)(i) many candidates did not appreciate the need to use error bounds. Some who then went on to round their answer showed understanding of significant figures, but often incorrectly rounded up. Candidates who did use the correct bounds of 209.5 and 86.5 usually did so correctly and accurately and were able to score full marks.

A high proportion of candidates did use their answer in Q1(f)(ii) and showed method to gain follow through method marks.

Question No. 2

Responses to Q2(a) showed that most candidates were familiar with two-way tables scoring 2 or 3 marks in part (i) and full marks in part (ii). Missing labels on the table was generally the reason for the mark lost in part (i).
In Q2(b) the best responses explained how they would use a calculation involving the number of bedrooms and the number of people in each house. Common incorrect responses either referred to 'using the average' or suggested 'a comparison', but then did not go on to say how comparing the values would show unused bedrooms. A smaller number of candidates suggesting adding extra questions or linking to type of central heating used.

Question No. 3

The correct answer to Q3(a) was generally seen, although a significant number used trial and improvement rather than an algebraic method. Arithmetic errors were more common when candidates used trial and improvement.
In Q3(b)(i) a significant number of candidates gave an embedded answer, commonly using 44 for x, with no preceding algebraic inequality. Other common errors involved using 100x or >.
Q3(b)(ii) saw many correct solutions, and again trial and improvement was frequently the chosen method.
Candidates generally gained full marks in Q3(c)(i) and Q3(c)(ii); however Q3(c)(iii) showed the standard of written communication to be generally poor, with a number of candidates making reference to irrelevant external factors. The best responses focused on the graph itself and other information given in this question part.

Question No. 4

In Q4(a) candidates more often scored 1 mark than 2 marks as the relation of speed and thinking distance was not fully described.
In general in Q4(b) candidates had difficulty expressing their reason clearly.
In Q4(c), part (i) was invariably correct, while in part (ii) candidates commonly compared one or two values. The best responses highlighted the value that was different and stated that it was very close. Q4(c)(iii) highlighted candidates' competence at plotting points, but a significant number did not actually draw a smooth curve to complete the graph.
Q4(d) was generally answered correctly, the most common values chosen were 10 and 15.

Question No. 5

Candidates performed very well in Q5(a)(i), Q5(a)(ii) and Q5(b)(i); and approximately half the candidates understood how to interpret the graph and correctly read the value from the axis.
A lack of clear method meant that examiners were often unable to award part marks in Q5(b)(iii). Where a division sum was shown there often was no indication of how candidates had found the values used; scale misreads used in these sums could only be rewarded if there was clear working shown on the graph.
About half of candidates gave a correct response to Q5(b(iv) 'speed' being the most common response. However this was sometimes incorrectly embellished, for example 'average speed' suggesting that not all candidates understood that it was the speed at that particular instant.

Question No. 6

Q6(a) showed that most candidates were able to interpret the net correctly, although a few lost the mark through placing '*t*' in the centre of the triangle or as an angle rather than a side.
Candidates found Q6(b) challenging. The best responses used a trigonometry ratio or cosine rule and working that led to the angle 67.5°. Responses using sum of angles on a line / in a triangle generally lost some marks through not giving reasons for steps in their working. Responses that began with the angle of 67.5° were often circular and did not show anything, although it was possible to give some credit where this approach led to the side length 8.9.
Q6(c) was a good discriminator between abilities. Several approaches to a correct solution were possible and candidates tended to use an approach that involved repeated use of Pythagoras. However some candidates using this approach stopped when they reached the value 8.22(…), using this as the pyramid height. This question part highlighted the need for candidates to set out their work clearly, showing the sequence of calculations and some indicating of the lengths or angles they were calculating.
In Q6(d) the best responses revisited the net, appreciated that no further calculations were required for the width and used trigonometry to find the 'missing' part of the length. Although the width of 8.9 was often given although it was disappointing to see some candidates performing unnecessary long calculations leading to an answer 8.88. Various calculations were seen to find the overall length and again clear method would help to gain part marks.

Question No. 7

Q7(a) and Q7(b) were generally correct.
Some good attempts at Q7(c) were seen with a variety of methods used to find the required proportion of 12000. A small but significant number of candidates confused frequency and frequency density.

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