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RECOGNISING ACHIEVEMENT

GCSE

Mathematics C

General Certificate of Secondary Education **GCSE J517**

Report on the Units

June 2008

J517/MS/R/08

Oxford Cambridge and RSA Examinations

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Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

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GCSE Mathematics C (J517)

REPORT ON THE UNITS

Chief Examiner's Report

General Comments

The trend towards higher modules which I have been reporting in earlier sessions this year has continued for J517 as well as for J516. However, what was different this summer compared with the last two years of syllabus change was that centres were able to enter year 9 candidates for their first module if they wished, two years before final aggregation – and a considerable number of them did. Some year 9 candidates may of course be aggregating before June 2010, but once again centres have been able to use the flexibility that this specification offers, to help structure their teaching and to give motivation and feedback on progress.

As expected in June, the entry from year 10 candidates was the main focus of the entry for modules, so that J517 entries were in the majority, with the J516 modules being used mostly for a last attempt to gain more uniform marks for those aggregating at this time, or possibly in January 2009. With a view towards summer 2009, centres may wish to refer to my comments in the J516 report concerning revision for the terminal papers.

B271: Module Test M1

General Comments

There were a pleasing number of candidates who scored high marks on this paper. Many candidates demonstrated reasonable understanding of basic numerical processes but very few of them wrote anything in the way of evidence for the methods they had used. Where jottings were recorded, usually in Section A, these were for elaborate counting methods rather than standard calculations, eg circles with dots in for division.

Many candidates did not possess a ruler and most drawings were completed freehand. Coordinates seemed quite well understood, with few reversals, but where these were placed in a context, as on the map, candidates were nonplussed.

Very few candidates seemed to have a calculator or, if they did, know how to use it correctly.

Comments on Individual Questions

Section A

1 **(a)** Usually correctly answered with the occasional 31 seen.

(b) Often correctly answered although some candidates required counting techniques to reach an answer.

(c) Usually correctly answered, although 100 was a common error.

(d) This part of the question was often the least well answered. Many candidates did not know their tables and attempted lengthy techniques to divide by 9, or did not attempt the question.

2 Most candidates responded well to both parts.

3 **(a)(i)** A significant minority gave the incorrect response of “hexagon” and a few, “polygon” but many gave a response that could be understood as “pentagon”.

(ii) 4 was often seen on the diagram and the answer line, but 20 was less frequently seen.

(b)(i) Many candidates gained 1 mark by choosing one of B and C. Few chose more than two of the diagrams.

(ii) 9 was a frequent wrong answer but many candidates did not show any clear understanding of what was required to find 3/4 of an amount.

4 **(a)** This was often well answered.

(b) This was often well answered, although some selected more than the four multiples of 5.

(c) This was often well answered.

(d) Part (i) was frequently correct, although (ii) was equally often wrong with the most common incorrect answer “subtract 3”.

5 A pleasingly large number of candidates scored well on this question although some answers to the parts seemed rather random. A very few gave embedded answers by rewriting the original questions with their values replaced. Inverse methods were rarely seen with many using trial and improvement (guesses) to achieve answers.

(a) Candidates often required counting techniques or a variant of trial and improvement.

(b) 42 was a frequent wrong answer.

6 **(a)** Many interpreted the pictogram correctly although a small number gave the incorrect response 2, which resulted from counting the symbols.

(b) Many candidates answered correctly. Those who answered part (a) as 2 were able to gain a follow through mark when they answered 6·5.

7 **(a)** This was often well answered although some gave the answer 18, which resulted from counting the visible indentations in the tin.

(b)(i) Many candidates were unable to write the correct time, with 5:40 a common error (or 20 to six) although some answers bore no apparent relation to the clock shown. Some candidates drew arcs on the clock as an aid to finding times.

(ii) Candidates who gained the right answer to part (i) usually answered this part correctly. Many scored a follow through mark for adding 30 minutes to their wrong start time. However, many who gave wrong answers were unable to correctly add 30 minutes to their stated time in part (i).

Section B

8 **(a)(i)** Usually well answered, although 605 was a frequent wrong answer.

(ii) Usually well done.

(b) This was often answered incorrectly, with 70 a frequent wrong answer.

9 **(a)** Many candidates correctly chose Lou but the reasons were frequently general rather than specifically referring to numbers. Consequently, “It looked bigger” and “Phil had a hole in his” did not score; whereas “Lou used 15 and Phil only 13” scored full marks.

(b) This question differentiated acutely, with the vast majority of stronger candidates able to give the correct answer. In contrast, very few of the weaker candidates answered this correctly.

10 **(a)** Many candidates listed three new arrangements and scored 1 mark. A few candidates misinterpreted the question and listed repeat items such as “Jazz, Jazz, Pop” or introduced other music types such as Classics.

(b) Few candidates scored 3 marks. The most common error was to omit “evens” for grunge.

11 **(a)** Most candidates answered correctly with a minority reversing the coordinates.

(b) Placing the point where the Lusitania sank was poorly done with many candidates not attempting the question. When attempted (12, 5·5) (12, 5) and (13, 5) were common.

(c) Many candidates were unsure about this question.

(d) Most candidates answered correctly.

(e) Most candidates answered correctly.

(f) Most candidates answered correctly.

(g) Many candidates added the two distances rather than subtracting them. Those who attempted subtraction often, though not always, achieved the correct answer. There was significant evidence that many candidates did not have, or could not use appropriately, a calculator.

(h)(i) A surprising number of candidates answered incorrectly, often giving 20 knots as the wrong answer.

(ii) Candidates who answered part (h)(i) incorrectly struggled with this and many left the graph blank. Few candidates used a ruler to draw their lines.

12 Many reasonable attempts were seen, although most were sketched rather than drawn with a ruler. Usually the left hand upright and the top horizontal were correct, though completely correct drawings were not so common. A few candidates attempted an enlargement scale factor 3 and a few failed to use the given line. A small number of candidates attempted tessellations.

B272: Module Test M2

General Comments

The majority of candidates made a serious effort to show what they could achieve. About ten percent of candidates gained less than 25% of the available marks, with five percent more than 75% of the available marks.

Performance was close to that on the similar but not equivalent module sat last summer. There was a wide spread of marks seen in both sections of the paper, but overall, candidates tended to do better on Section A than Section B, with an average margin of about 2 marks.

There were relatively few instances of questions not attempted. In terms of omissions Questions 4(b), 10(b)(ii) and 11(b) were the worst questions with omission rates of about one tenth. There were no obvious instances of candidates misinterpreting the rubric. The overall standard of presentation was generally satisfactory, both number work and handwriting were readable. Candidates completed the paper within the time allowed.

Areas of content in which most candidates overall demonstrated good levels of success included: reflection symmetry (Q.2c), basic addition of money without a calculator (Q.4c), interpreting charts and tables (Q.12).

Areas of content in which candidates appeared to have particular difficulties were: converting simple decimals to fractions (Q.4b), conversion between different metric units (Q.5a) and estimating lengths (Q.10a).

The less capable found reading charts, reflections and elementary algebra accessible, but had difficulty with fractions, converting between different metric units and negative numbers. The most capable achieved high levels of success with finding the value of an unknown in a simple situation and reflections, but sometimes found converting between different metric units challenging.

In common with previous years there appeared to be candidates without access to protractors or calculators. In a similar vein there were candidates who failed to write down working and as a consequence failed to gain any of the available method marks.

Comments on Individual Questions

Section A

1 A well answered question, found moderately accessible by the least capable. Common errors included “nine thousand, five hundred and one”, “nine zero five one” and variations on these.

2 (a) About one third of candidates were successful with this question. As might be expected, most errors involved giving the supplement of the correct angle. There were a small, but noticeable, number who gave a distance in centimetres; 3·5 was a common answer – which was about the distance from the angle vertex to the arc labelling the angle.

(b) Candidates were more successful with identifying types of angle. Many gained partial credit for identifying two out of the four correctly. There were instances of candidates measuring the indicated angles but no credit given for this.

(c) A very well answered part question, found accessible by the least capable. Problems, when they arose, tended to involve the identification of the bottom left-hand square.

3 **(a)** Correctly answered by about half the candidates. A prevalent wrong answer was 9051 – this together with the erroneous responses to part (b) tended to suggest confusion between mode and median (and in some cases mean).

(b) Not as well answered as part (a), particularly by candidates of average and above capabilities. As with part (a) common incorrect responses were 9051 (the middle value in the given list) and 3010. Partial credit was awarded for correctly ordering the scores.

4 **(a)** Only about a third of all candidates were successful with this part question. This proportion was considerably reduced for the least capable, but greatly increased for the most capable. Two very widespread errors were 75% (suggesting misreading this commonly used scale) or $\frac{1}{4}$ (not fully grasping "percentage").

(b) Found very challenging. Only about a quarter of candidates were successful. Many showed a poor understanding of simple decimal to fraction conversion, well illustrated by the prevalence of the wrong answers 0/7·5, 0/75 and 7/5. About one in ten candidates omitted this part question.

(c) A fairly well answered part question, easily accessible to the lower attaining candidates. There were several instances of candidates employing the strategy "£9 + £5·50", but them omitting to take off the penny for their final answer. There was also evidence of forgetting to "carry" across the decimal point. Partial credit was obtainable for realising that the calculation "8·99 + 5·50" was required; a number of candidates did not gain this as they gave no working.

5 **(a)(i)** A very poorly answered part question; fewer than one in ten were successful. It was found a challenge by even the most capable. There was a wide range of incorrect responses, but no obvious pattern or logic to them.

(ii) A poorly answered question, but marginally better answered than part (i). There was no obvious pattern to the wrong answers.

(b) The chance of partial credit for sight of 16 × 3 was denied to those candidates who failed to show any working. A variety of informal methods for performing the multiplication were noted and partial credit was awarded for a clear intention to do this, even if the final answer was incorrect. However, there were a notable number of candidates who attempted to solve the problem by calculating 16 + 3, showing a lack of appreciation of the process that the problem involved. Overall about two thirds of the available marks were scored for this part question.

6 **(a)** About a half of all candidates were successful, falling to less than a quarter for the least capable. A number of probability lines were left blank or showed evidence of being split up, but with no clear indication as to which mark corresponded to the answer. A large number indicated points were close to the half-way point.

(b) A similar proportion of candidates were successful with this part question as were successful with the first part. Partial credit was available for the realisation of one of the conditions. A popular error was to give equal numbers of £10s, £5s and £1s. Another was to have three £5s, two £10s and one £1. The vast majority of candidates attempted the question; there were very few omissions.

7 Most candidates gained at least partial credit for this question. A few had not fully understood what was required and gave 15 as their answer. Some credit was available for correctly adding terms to either number pattern.

8 Overall slightly less than one third of the available marks were gained for this question. The top line appeared to cause the most problems with the inverse (× ✓ ×) to the correct answer commonly given.

Section B

9 (a) Found very challenging by the least capable, and overall about a third of the available marks were achieved. There were a variety of incorrect answers, including: £192 (from £480 ÷ 25), £505 (from £480 + £25) and £455 (from £480 - £25).

(b) This part question was found accessible by all; over a quarter of the lowest capability candidates gained full credit. All commonly used time formats were acceptable. A common incorrect response was 1:55.

(c) A very well answered part question; about half of the least capable were successful. The most frequently observed wrong answer was 7 am, a result perhaps of misreading the question as giving the time in Poland and asking for the UK time.

10 (a)(i) A rather poorly answered part question; less than a third of candidates gave an estimate within the allowed range. The wrong answers were so wide of the mark as to suggest that these candidates had no 'feel' for units of length.

(ii) Slightly less well answered than the previous part.

(b)(i) This question was found too challenging for all but the most capable; partial credit was available for the answer of 5. There was some hint that poor literacy skills led candidates into using the "737" in Boeing 737 in their calculations. Working was, in the main, not shown and this no doubt lost some candidates potential method marks.

(ii) Some follow through was available from the first part, but even so this question was one of the worst answered on the whole paper.

11 (a) A well answered question, but one with a relatively high number of omissions. Almost two thirds of all candidates achieved full credit.

(b) There were very few correct answers, although some candidates did gain partial credit. Conversion was frequently given the 'wrong way round' in the explanation, eg "A £ is 6 zlotys, so 10 zlotys would be about £60", or sometimes comments were given about the cost of living in Poland or the numerical values of the respective notes as opposed to their value.

12 **(a)(i)** One of the best answered questions. In total more than three quarters of the obtainable marks were gained.

(ii) A number of candidates gave March only, having failed to read "months". This was a fairly well answered question; partial credit was available for giving two of the three months correctly.

(b)(i) A very well answered part question; over three quarters of all candidates gave the correct answer.

(ii) A well answered question.

(iii) This was found difficult by the least capable, but over thee quarters of the available marks were gained by the most capable. The most frequently observed incorrect working was 3 – 2.

13 **(a)** Almost two thirds of candidates were successful, with Kleparski or "K" the most common errors.

(b) A rather poorly answered part question. Many candidates lost all the available marks by getting the first direction wrong. Commonly observed incorrect responses were left, left, left or left, right, right.

14 About one quarter of the available marks were scored by candidates overall. Partial credit was available for this multi-step question. A popular answer which gained partial credit was 97·15 zlotys, from 150 – 38·50 – 14·35. This question was notable for the lack of working shown; many candidates just wrote an answer.

B273: Module Test M3

General Comments

A wide spread of marks was seen on this paper with candidates having sufficient time to complete it. Examiners felt that the paper was set at the appropriate level. A disappointing number of candidates scored below 15, suggesting that they were insufficiently prepared or entered at the wrong level.

Many candidates failed to show any working out, which caused them to lose available method marks if their final answer was incorrect. In questions requiring explanations, candidates need to be more precise in their explanation and make better use of mathematical language.

Candidates performed particularly well on the questions involving time and solving equations. Particular areas of weakness were interpreting scales and metric units.

Comments on Individual Questions

Section A

1 Candidates performed well on this question with the majority drawing bars correctly and using the obvious scale of 1 square per person. Many candidates omitted to label the vertical scale, so lost a mark. Those candidates who included a scale generally did it correctly with only very few losing the mark for labelling the blocks or using a non-linear scale. Use of a ruler would improve the presentation in questions of this type.

2 **(a)** Almost all candidates answered part (a) correctly.

(b)(c) In parts (b) and (c) some candidates failed to score as they used probability words, such as unlikely, or the number of times the required card occurred rather than fractions. The stronger candidates could identify the correct probabilities, though there were a number of incorrect forms such as ratios; however candidates using these often scored the follow through mark in part (c). Few candidates used the incorrect denominator – those that gave the answer 1/8 in (b) usually followed with 3/6 in (c).

3 **(a)** Many candidates attempted to work out 0·4 × 3 either by multiplication or by repeated addition, although they often struggled with the positioning of the decimal point. Answers of 12 and 0·12 were common. A significant minority calculated 0·4 × 4 and so failed to score.

(b) This was less successful than part (a). Although a number of correct answers were seen, these often appeared to be from trial and improvement methods rather than division by 10. Very few method marks were awarded as often just an answer was seen. Answers of 5 were common from 15 – 10, as well as 150 from 15 × 10. Very few candidates lost a mark for writing 1·5 rather than 1·50.

4 In general, candidates answered (a) and (c) well. Part (b) caused more problems, with some candidates failing to understand the notation and giving an answer of 24 (from 3 + 24 = 27) or from errors in their 3 times table. Weaker candidates gave the answer of 2 in (c) from 9 – 7. Few candidates gave embedded answers.

5 **(a)** This was very poorly answered, with very few candidates having any idea of how to calculate a percentage. 10% was a very common answer, from subtracting the two numbers in the question. Some candidates halved and halved again to get 25% and then often rounded down to 7 as a guess at the answer for 20%. Very few attempts to work out 10% and then double it, or to use the fact that 20% = 1/5 and then divide 30 by 5 were seen.

(b) This was well answered, with most candidates being able to write a time correctly. The most common mistake was to add the 30 minutes on rather than to subtract it.

(c) Many candidates scored full marks here, although little working out was seen in part (i). The most common error was to fail to deal with the conversion from minutes to hours correctly, with 3 hours 5 minutes being seen frequently, although a follow through mark was often awarded for 2:05 seen in part (ii). Candidates need to take care with changing from morning to afternoon – some lost a mark for an answer of 2:45 am in (ii).

6 This was very poorly answered with many candidates failing to score at all. This was often because a single answer was seen with no working out. Candidates need to be encouraged to show workings in questions like this where there are several marks available and a large amount of working space has been provided. Those candidates who did show working often found one quarter of 200 correctly, although many had difficulty finding 3 tenths. In this case a clear layout in their working often led them to score 2 out of the 3 available marks. Some candidates tried to combine the two fractions given, rather than calculate fractions of 200, and answers such as 4/14 were not uncommon. Very few candidates scored for using the alternative method and getting to either 9/20 or 11/20.

7 **(a)** Candidates often seemed to know why the enlargement was not correct although they struggled to express themselves clearly. Those that identified which dimension was incorrect often scored by saying that it was too short. Those that referred to not multiplying by two often did not identify the required dimension, so did not score.

(b) The stronger candidates answered this well, and a significant number scored a mark for either using a scale factor of 2 or for getting two of the lines correct. Weaker candidates often just copied the original diagram or just added one or two squares to the sides of the original diagram.

Section B

8 **(a)** This question was very poorly done with the majority of candidates answering using imperial units – miles and pounds being the most common. More candidates were correct with kilograms in part (ii), although units such as metres in (i) and stones in (ii) were also seen, suggesting that candidates have very little idea of the meaning of different units of measure.

(b) This was poorly done with many candidates making the obvious errors and giving answers of 290 or even 230 in (i) and 3·3 in (ii).

9 **(a)** Most candidates appeared not to know what a square number was, with answers of 10 being common, although almost every number less than 20 was seen at some time.

(b) Candidates were more successful at finding the square root than the square, usually because they used the correct button on their calculator for the square root, but often mentally doubled for the square, leading to an answer of 42.

10 **(a)** In this question candidates' weakness at using metric units was demonstrated. Answers of 5 and 50 were common, indicating that candidates either did not know the conversion factor or were unable to multiply by 1000.

(b) This was done better than (a), although many candidates subtracted the 450 ml from 1 litre, leading to an answer of 550 ml rather than 1550 ml. Weaker candidates got answers of 448 by subtracting 2 from 450, or 225 by halving it.

(c) Many candidates answered this part well, although sometimes lost the mark for omitting the decimal point. Weaker candidates appeared to guess and commonly gave answers of 1 or 4.

11 **(a)** This was badly done, with the usual confusion between averages seen. Attempts at the median and the mode were as common as the mean. Some candidates knew to add, but then did not divide by 10. Some appeared to have multiplied by 10, but without working seen did not score.

(b) More candidates here knew how to calculate the range, although some ignored the 0 and calculated 22 – 2 instead of 22 – 0.

12 **(a)** Many candidates realised that the ladder would not fit, but failed to give an adequate reason. Reasons such as 'the ladder is too big' did not score as candidates needed to show that they were comparing its length with the correct dimension of the shed. Many just restated the scale in their reason and did not score. Those candidates who used the scale generally scored both marks, as they were able to calculate the real length of the shed as 2 metres or to say that the ladder was 0·4 metres too long.

(b) Many candidates did not attempt this question and a significant minority drew their diagram below the question rather than on the plan view. Candidates who understood what was required often got a rectangle with one side 5 cm, but many failed to convert the 0· 8m correctly to 4 cm; 0·8 cm was frequently seen.

13 **(a)** This was very poorly answered with very few candidates having any idea about how to substitute into this formula. Answers of 75 (25 × 3), 37 (25 + 12) and 28 (25 + 3) were very common. The method mark was almost never awarded, as those candidates who knew what to do reached the correct answer.

(b) Candidates performed better on this part, although problems with reading scales surfaced again, with answers of 52 very common.

(c) This was another question where far more candidates would have gained some credit if they had showed some working out, but it was too common to just see an incorrect answer on the answer line. Those who showed working often gained two marks: one for reading from the graph correctly and the second for showing the subtraction of their two values.

B274: Module Test M4

General Comments

The majority of candidates were able to attempt all questions. There were, however, a small number who appeared to have been entered at an incorrect level as they had difficulty in giving even basic responses. On questions which require reasons or explanation candidates should ensure that their answers are fully explained.

A lack of working out prevented several candidates from scoring marks, especially on questions where more than one mark was available.

There was also evidence on Section B to indicate that a significant number of candidates did not have access to a calculator.

Comments on Individual Questions

Section A

1 **(a)(i)** This question indicated that most candidates had a poor understanding of prime numbers. 8 was a common incorrect answer.

(ii) More candidates were able to answer this than part (i); however 12 was a common incorrect answer.

(b) Most candidates attempted this question. 0·14 was the most common incorrect answer. Some candidates wrote the list of numbers in order but failed to indicate which was the smallest. A small number of candidates did not attempt the question.

2 **(a)** Very few correct answers were seen. Many candidates reflected the triangle in the *y*-axis.

(b) More correct answers were seen in this part than part (a). A small number of candidates reflected their B rather than A. Another common error was to fail to label the reflections.

3 **(a)** Generally well answered; some candidates still reverse coordinates.

(b)(i) This was fairly well answered, although several candidates appeared not to know what a parallelogram was. D was often plotted at (1, ¯1) making a trapezium.

(ii) Generally well answered. Many who had incorrectly plotted D were able to give the coordinates of their point and score the mark.

4 **(a)** Poorly answered, with many candidates appearing not to understand that percentage is out of 100. 2/3 was the most common incorrect answer.

(b) This was rarely correct; many candidates did not attempt this question. Of those who did, 104 and 52 were often given as answers. Some appeared not to understand fractions and gave an answer larger than 208.

(c)(i) Generally correct. Of those who did not give the correct answer, the most common answer was Friday and 290.

(ii) Generally correct.

5 **(a)** Many candidates were able to identify 3/8; some however then wrote this incorrectly, for example 3:8. Many weaker candidates wrote word answers.

(b) Not as well answered as part (a). Several gave the probability of yellow rather than not yellow. Many of those who used the incorrect denominator or form in part (a) correctly followed this through in part (b).

(c) Generally well answered.

6 Most candidates attempted this question and a variety of methods were seen. Fewer errors were made by candidates using a grid method than by those using the traditional method. Place value continues to be a problem for many candidates.

7 Few candidates realised that the question required an expression, and often gave a numerical value, usually 8.

8 **(a)** Generally correct. The most common incorrect answers were 408 or 500.

(b)(i) Well answered.

(ii) Generally correct. The most common incorrect answer was 8, as candidates just counted the squares along the flat section of the graph.

(c) Better candidates were able to give the correct answer. Many candidates had written 300, but failed to realise the need to divide by 3.

Section B

9 Many candidates gave the correct answer, although a significant number had not written down any working and were unable to score the method mark. The most common error was to calculate the perimeter.

10 **(a)(i)** Reasonably well answered, with the majority of candidates correctly finding the first number. Some appeared only to have looked at the last 2 numbers in the sequence and subtracted 3 twice.

(ii) Some candidates were unable to give a correct explanation despite having correctly answered part (i). The most common reason was ‘subtract 1’.

(b) The majority of candidates were able to correctly answer this question.

11 Very poor. The majority of candidates appeared not to know the comparison between litres and gallons.

12 **(a)** Many candidates gave the answer 35. Better candidates were also able to give the correct reason. Weaker candidates often wrote ‘it’s the same as *y*’, but did not give the reason.

(b) 110 was often seen, which scored 2 marks. Very few candidates stated that the triangle was isosceles. Many erroneously stated that B and C were the same due to parallel lines. Many candidates had written it 'all adds to 180', but failed to mention that 'it' was a triangle.

13 **(a)** Better candidates were able to answer this correctly. Weaker candidates often worked out the mean. Others were unable to correctly identify the largest or smallest number, or correctly subtract.

(b) A lack of working out, and obvious computational errors, prevented candidates from scoring marks on this question. The common errors were to give the range or median.

14 This was well answered by better candidates. A significant number of candidates appeared not to have a calculator. A lack of working again prevented method marks being scored. Many were unable to multiply decimals. The majority of candidates were able to give the correct units for their answers.

15 **(a)** Generally well answered. A small number of candidates had not realised the original recipe was for 12 and multiplied 80 by 48.

(b) Generally well answered.

(c) Generally well answered.

B275: Module Test M5

General Comments

A varied range of scores was seen from candidates, and there was sufficient time for them to complete the paper. Many candidates did not have the required equipment, especially a calculator in Section B. Working was not always seen, and it was particularly essential in Section B.

The algebra questions were usually answered well; the candidates had problems with number. Knowledge of multiplication tables and equivalent forms was patchy; however, most candidates had been well prepared for this unit.

Comments on Individual Questions

Section A

1 **(a)** Those who used a systematic approach, eg AD BA BC BD and so on were almost always successful. Some missed out one choice due to their list not having a logical order. Some assumed from the examples that the first choice had to be A so they repeated most of the given arrangements. Some gave impossible choices such as AA.

(b) Most candidates counted each row as two choices so few obtained the correct answer.

2 **(a)(i)** This was answered well, with 30 000 or 30 400 as alternative answers.

(ii) Few gave the correct answer; many wrote 3 or 30.

(b) Despite the hint in part (a) few wrote down estimates; most attempted the long multiplication of 19 × 30 465.

(c)(i) Many did not order the numbers and gave 25 234 as the median.

(ii) Most did not know that they needed to compare the ranges and instead compared the medians, or the median to the range.

3 **(a)(i)** This question was answered well. Some embedded the answer in the equation.

(ii) A common response was 25 − 3 − 1, giving an answer of 21.

(b) The first term of 9*a* was achieved by many but the second was often added as 19*b*. Occasionally the correct answer was spoilt by a final answer of 20*ab*.

4 **(a)** A common answer was 4 from 4 × 10 = 40.

(b) The percentage was often given as 9 rather than 90. Indeed the zero was often written down then crossed out. The decimal was more often correct but 0·3 was seen, and the fraction was usually written over 1000.

5 **(a)** 2^4 was calculated as 2 × 4 = 8, and 3^2 was calculated as 3 × 2 = 6. Some tried to combine the powers and wrote 5^6.

(b) Few actually worked out the values of each calculation. The errors were usually in working out A or C or D as $^+8$ rather than $^-8$. It was obvious that many had changed some correct answers so that they would get three the same.

6 **(a)** Most tried to estimate the angle from the diagram and they would give an answer of 45, 60 or 80 as the common wrong answers. The length was usually correct.

(b) The most common response was 'Yes' and a confirmation that these are the properties of a rectangle. However this showed that they had misunderstood the question. The most popular answer was that it could have been a square.

Section B

7 **(a)** This was answered poorly. The angle caused the biggest problem and was usually inaccurate. Many candidates appeared to have no access to geometrical equipment and attempted the question freehand. The length was often measured too long.

(b) The line BC was often measured incorrectly; many measured the wrong line.

8 **(a)** A common approach was to write 4*z* as 47 or 4 + 7 rather than 4 × 7. The calculation was still executed incorrectly despite calculators being available.

(b) As in (a), treating 5*s* as 517 and 3*t* as 314 was a common approach.

9 **(a)** The measuring was often inaccurate and using the wrong scale on the protractor by giving answers of over 120º. Many were confused between the bearing and the distance, and many answers here were clearly intended distances. There were many who did not appear to have the correct geometrical equipment.

(b) The distance was measured inaccurately; clearly some did not start from zero. Many simply multiplied the angle by 5. Those who did measure correctly still calculated wrongly so examiners saw 5 × 6·5 = 30·5. This was despite the fact that calculators were available.

10 **(a)** The main argument was that the angle was over 180° or 'most chose French'. There were relatively few who showed that each person was represented by 4°.

(b) Little working was seen here yet the most common answer was 25. This could have been derived correctly from 100° by dividing by 4 or else obtained from 50 or 200. Those who did show that they had measured the angle or percentage correctly were rewarded.

11 There were few who used the correct formula for the volume. Candidates either added the three lengths or they multiplied each by two or four then added them in an attempt to find the surface area.

12 The main problem was to find 45%. A common approach was to divide 600 by 45 or to use the halving method to find 50% and so on. Often when a decimal was obtained it did make the task of finding one-fifth difficult. The most common response was to get 270 but then dividing by 5 was seen as difficult. The surprise was that although calculators were available, many candidates were doing the calculations without them.

13 **(a)** This was usually answered correctly.

(b) The points were not always plotted in the correct place, and when they were they were often not joined with a straight line.

14 As expected many gained the mark for the top right quadrant but struggled to get the other two correct. Candidates could have achieved more if they had used tracing paper.

B276: Module Test M6

General Comments

Nearly the whole spread of marks was seen on both versions of this module, with little difference in candidate performance between the two cohorts in terms of the mean mark.

As is often the case, weaker candidates failed to show working. In general, arithmetical skills were often very weak, as evidenced by the first two questions, with candidates often having no sure methods for multiplication, division and subtraction. Some candidates clearly did not have basic equipment with them and were unable to gain marks for constructing the triangle in question 6, for example.

Some examiners commented that good or poor papers tended to come in batches, which suggests that candidates from some centres were well prepared but others less so, with some candidates well out of their depth. The vast majority of candidates attempted the whole paper within the allocated time, although the more difficult algebra at the end of each section was sometimes omitted by weaker candidates – examiners felt that this was because they did not know what to do, rather than their running out of time.

Comments on Individual Questions

Section A

1 **(a)** Many candidates were not aware of the need to consider the correct order of operations, it seemed. There were far more answers of 20, from adding the 6 and 4 first, than the correct answer of 14.

(b)(i) This was poorly answered, mainly through inability to place the decimal point correctly.

(ii) Again, although candidates knew 30 divided by 6 is 5, most were unable to get the answer 50, giving 0·5 or 5 as their answer. A few saw the question as an invitation to multiply so that figures 18 appeared.

2 Many candidates gained all three marks here, but poor arithmetic was evident from others. The setting out of work was often the main cause of their problems. For instance, the cost of 3 scarves was sometimes attempted as 3 × 7, 3 × 50 and 3 × 5, but in such a confused way that they were unable to achieve the correct answer. There are also problems with subtraction, with many unable to cope with the idea of borrowing from one column to another. £30 − £26·60 was often given as £4·40, for example. A considerable minority did not read the question and only accounted for one scarf.

3 Those who used a common denominator of 20 usually gained both marks but answers of 1/1 were popular. Some obtained the correct answer of 1/20 wrongly, from 4/20 − 3/20. Such answers were given no credit.

4 Answers for the size of angles were generally correct, although some candidates were not sure of the angle sum of a triangle, with 160° being fairly popular. The reasons were not so good, particularly for *b*, where many candidates simply stated ‘because the lines are parallel’.

5 **(a)** Most candidates have grasped the concept of positive correlation.

(b) Most drew a line of best fit, but too many lost the mark because they drew it through the corner of the graph space (130, 18), which took it outside the acceptable values. While this may look a reasonable line of best fit, it is too low. The examiners accept that, with hindsight, it might have helped if the *y*-axis had started at 17, not 18. Some candidates seemed to lack a ruler; some weaker candidates simply joined all the plotted points.

(c) This was usually correct, although a few misread their scales, eg 25·3 for 25·6.

6 The vast majority picked up at least one mark on this construction question. Arcs were not used in most cases. Some candidates made no response and it was not clear whether this was due to lack of knowledge or lack of mathematical equipment.

7 **(a)** Few candidates coped correctly with the negative number substitution. The most common wrong answer was −2.

(b)(i) Many candidates had some idea of inverse operations in solving equations and those who could use them successfully often gained both marks. 11 ÷ 2 = 5r1 was one of the errors. Some made an error in the first step of solution, such as $2x = 5$ instead of $2x = 11$; those who went on to solve their equation successfully were given partial credit.

(ii) If the students set out their work clearly, they were generally able to gain some credit. However, in many cases working and/or equations were not shown, so that $x = 3$, which was often seen scored 0, but when it was with working it often achieved some method marks. Some candidates had no idea of solving equations using algebraic manipulation.

Section B

8 **(a)** Order of operations with a calculator was a problem here, with many failing to use brackets, or to add the numbers first before finding the square root, so that 32·41 was a common wrong answer.

(b) Few candidates were able to covert 3·7 hours into hours and minutes correctly. 4 hours 10 minutes (from 3 hours 70 minutes) and 3 hours 7 minutes were popular wrong answers, but some had answers exceeding 6 hours, for example.

9 This probability question was well-answered, with many correct answers seen. Those who did not get full marks often gained partial credit for 0·7, obtained from wrongly adding 0·4 and 0·26 as 0·3. Some lost both marks by writing down wrong answers of 0·66 or 0·44 without showing any working.

10 **(a)** There were a good number of correct answers, but 5, 3, 1 was the most common error.

(b) Most were able to plot their points and gain the follow through mark. Many who plotted the correct points did not join them up.

11 **(a)** This was very often correct. A common error was to choose 74 instead of 78.

(b) Many gained part marks for getting as far as identifying 54 or 56, but considerably fewer went on to give the median as 55. Some gave an answer of 4 or 5 (the leaf number without the stem number). There was much crossing off from the ends of the diagram to find the median, with evidence of miscounting on some occasions. Some candidates took the leaf numbers, ordered them and found the median value of these without reference to the stems. A few confused the median with the mean.

(c) One mark was often gained by spotting that the lowest value had not been used. Fewer were able to explain clearly the need for subtraction, for instance some suggested that the largest value should be subtracted from the smallest.

12 **(a)** The correct answer was seen quite often, but a very popular wrong answer was 78, as candidates wrongly added the ratios and divided by this answer.

(b) Many candidates were successful here, even when they had part (a) incorrect, since this was the standard 'sharing' ratio method. Some reached 129 but failed to multiply by 3. Others divided by 3 and gave 172 or 516 – 172 = 344.

13 Many correctly described a rotation of 90° clockwise but failed to give the centre of rotation. Many used a translation, usually 2 down, as well as a rotation, but fewer instances of this were seen on B276 than B246. The word 'turn' was frequently used. Very few candidates gained all three marks.

14 Very few candidates gained all 3 marks here. Some found the circumference or used $(\pi \times r)^2$ or simply gave the diameter. Units were often missing or incorrect.

15 **(a)** Some had this correct, but a very common error was to partially simplify to $6 \times p^3$. There were also some instances of $6p3$ or $6 \times 3p$, amongst other errors.

(b) This was more successful than part (a). A common wrong answer was $-5x$ from $5 \times 2x = 10x$, $5 \times (-3) = -15x$, then $10x - 15x = -5x$. Others found the correct expansion but then went further and so lost the mark. $10x - 3$ was also common.

(c) As expected, candidates found factorising harder than expansion, and many did not know what was required, with usually only the better candidates getting this part correct. An answer of $28x$ was a common error. Some gave $1(7x + 21)$ or a partial factorisation of $2(3{\cdot}5x + 10.5)$ or $3{\cdot}5(2x + 6)$.

B277: Module Test M7

General Comments

A significant number of candidates coped well and were able to attempt a good proportion of the paper and apply their knowledge to a worthwhile effect. Unfortunately many candidates appeared to be badly out of their depth, faring very badly, often with scores in single figures. In general, good scripts were characterised by the presence of some working, allowing examiners to award method marks even when the final answer was incorrect. The vast majority of the marks were between 10 and 30 with far more scoring under 10 than over 40. The responses to questions involving estimation, forming an equation and giving reasons were very poor. Algebra is clearly an area where many candidates feel uncertain. For many it was rare to see an algebraic solution to equations and instead numerical trial and improvement was a common method.

Comments on Individual Questions

Section A

1 **(a)** Many candidates used 40 and 16 or 20 but √65 caused a problem. Some common estimates used included 7 and 8·5. Some squared 65 or just worked with it as 65. Getting a correct answer from an acceptable fraction proved difficult for many with division by 16 often treated as division by 10 and then by 6. A few slips with answers of 2 or 200 were also seen. Approximating the denominator to 15 was a common error.

(b) Candidates achieved more success with this question with a significant number achieving 2 marks. √144 and 4^3 caused trouble more or less equally with 12 appearing for the latter alongside 32, 24, and various others clearly coming from lack of multiplication skills. √144 was also interpreted as 72 or even 144^2. Even when 12 and 64 were seen many answers were spoilt by errors like 12 + 64 = 78 or 86.

(c) Although many candidates struggled to express themselves about one half provided some convincing explanations. Common errors included, 'too many figures after the decimal point' and 0·8 × 0·92 could not be 0·656. Others wrote about 'multiplying by a decimal' without mentioning that it was less than 1 whilst some attempted to evaluate 0·92 × 26·8 exactly.

2 **(a)** Many achieved $x = 60$. Corresponding, opposite or assumptions about the triangle being equilateral or isosceles were common incorrect reasons, often alongside 'z-angles' being mentioned. Some measured the angle with a protractor.

(b) About a half of candidates picked up one or two marks but few could go on to earn all three. Many candidates simply showed their calculations whilst others gave incomplete geometrical reasons, often missing out angles in a triangle.

3 Better candidates often earned full marks. However, many others earned a method mark for 180/15 but were unable to correctly divide and so correct angles were not found. Many attempted division by 15 as division by 10 and then by 5. Common errors included 180/3, 180/5, 180/7 and also 15 parts so 3 × 15 = 45, 5 × 15 = 75, 7 × 15 = 105. Random guesses included 60,60,60 50,60,70 and 40,60,80.

4 Only the better candidates had any idea of what was required and completely correct algebraic solutions were rare. However, many were able to obtain the correct answer by use of trial and improvement. Of those who had some idea the main error was not to double the given sides (or halve the given perimeter). Some confused perimeter with area and $15(3x + 10) = 86$ was often seen.

5 (a) Many correct answers were seen but it was also common to see a list of factors in the answer space. Poor numeracy skills often resulted in the failure to score marks even when it was clear that candidates knew a correct method. Some confused the term product with sum starting with $63 = 60 + 3$. A surprising number of no responses were seen even in cases where a good attempt was made in (b).

(b) Some good answers were seen usually from listing multiples of both numbers but these were rare. Less common was a correct solution using prime factors. Most candidates had no idea, often confusing LCM and HCF or giving answers of 3, 7, 21.

6 (a) Many candidates seemed unprepared to use algebra. Some good solutions were seen (about one in every four) along with many correct solutions obtained by trial and improvement. Common errors in the first step included $12x – 5 = 15$ and occasionally $12x – 15 = 45$. These candidates often picked up a later method mark. The final step $12x = 30$ was often followed by 2·6. Also, $12x – 15 = 15$ often led to $12x = 0$.

(b) Many disappointing responses were seen with only about one in four candidates scoring both marks. Many failed to obtain four terms from the expansion with two only quite common. A small number picked up one mark, with sign errors the likely cause of loss of marks. A few had all signs positive so weren't thinking of –4 as a negative number. A common error was $x^2 – 1$, confusing multiplication in the first term with addition in the second. Many gave $3 + {}^{-}4$ as 7 or –7.

Section B

7 (a) Most candidates were able to pick up the mark for 'positive' even if they didn't know how to spell it correctly. Weaker candidates wrote things like 'heartbeat', 'weight', 'scattered', 'close' etc. Only a few gave a description of the relationship rather than the technical term.

(b)(i) The vast majority of the lines of best fit were ruled, and most fell within the levels of tolerance. There was a tendency, however, for some candidates to draw a line through the bottom left hand corner of the graph, which was just outside the acceptable range.

(ii) Most candidates realised what they needed to do in this part but a significant proportion misread the scale and took the reading from 61 rather than 62. A few got the answer and then doubled it, probably because of the reference in the question to two minutes.

8 (a) About a half of all candidates obtained the correct answer. Others struggled, with all vertices appearing as the answer at one time or another, although G was the most common wrong answer.

(b) Candidates fared less well on this part, with only one in five obtaining the correct coordinates. Many appeared to make a wild guess and 0, 4, 5, 9 and 12 were frequently seen as any of the three coordinates.

9 Many candidates spotted that the terms went up by 4 each time and often gave an answer of 26 as the next term in the sequence. A significant number of candidates misinterpreted "nth" as "ninth" and gave the answer 38. Others thought that n + 4 was the answer required. Only a minority realised the significance of 4n and of those most were able to complete the expression by adding the 2. Other wrong answers included $2n + 4$ and $6n + 4$ and less often $4n - 2$.

10 Over half of all candidates scored full marks. Many others managed to work with 23, 37 and 60 and most managed to go on to get at least one mark, either for the numerator or denominator. Most gave their answers as a fraction, with few marks being lost for incorrect notation.

11 A majority of the candidates seemed to have a reasonable idea of the sort of calculation required, though they did not always start with the correct midpoints. Few used the endpoints of the intervals, but some seemed to think that the mid-interval values should be integers and so some worked with 42, 47, 52 etc, others with 43, 48, 53 etc and others with a combination of these eg 42, 48, 52, 58, 62. There were still a significant minority who didn't understand the method required and gave the middle interval, or added the mid-interval values and divided by 5. A few got as far as finding $\sum fm$ but then divided by 5. A common answer from weak candidates was 40/5 = 8.

12 **(a)** Many candidates did not understand what they were expected to do in with many making no attempt and in other cases some very poor algebra was seen. There were very few attempts at substituting the values 1 and 2 and often when they were used very simple errors such as 8 + 6 = 12 and $1^3 = 3$ were seen.

(b) The attempts in part (b) were better and often suitable trials were done, but a correct conclusion was not always drawn with the final answer often being given to an inappropriate number of decimal places. Others offered $x = 11{\cdot}232$ showing a lack of understanding of the question.

13 Many candidates failed to identify the use of Pythagoras' theorem, possibly because the right-angled triangle was not obvious. Weaker candidates simply fiddled about with the figures whilst the better candidates usually managed the Pythagoras' theorem part but rounded incorrectly. A number of other candidates did a correct Pythagoras' theorem calculation, but used the wrong sides/figures, often 22·6 and 18·6. Many candidates just added the base and the height with others dividing the total by 2. Some picked up a consolation mark for obtaining 11·3, or for rounding to an appropriate degree of accuracy after an attempt at Pythagoras' theorem was seen.

14 This question was not well done. Although many candidates found the area of the square, only a small minority dealt with the subtraction of the area of the circle correctly. Some didn't seem to have heard about π, and gave results such as $15 \times 15 \times 10$, $15 \times 15 \div 10$ or $15 \times 15 - 10 \times 10$. Others didn't know the formula for the area of a circle and used the formula for the circumference, leading to common wrong answers around 193·6.
Many candidates made no attempt to state the units, though a small minority did pick up this mark.

B278: Module Test M8

General Comments

The vast majority of candidates were appropriately entered at this level and scored reasonably well on the paper and there were a number of very high scoring candidates. Standards of written work were variable however with the higher scoring candidates showing appropriate working, usually vertically, and recognising that marks were available for correct written methods. A few of the lower scoring candidates showed a choice of methods to some problems and were prone to showing more random jottings than structured working particularly on question 5. Where methods are contradictory for a question, examiners will mark the worst method shown unless a clear choice is made.

The questions on transformations, adding fractions, box plots, solving linear equations and moving averages were the best answered. The most challenging topics were sketching graphs of reciprocal and cubic functions, simultaneous equations, factorising and solving quadratics, and trigonometry.

All candidates had time to complete the two sections of the paper and where questions were left unanswered it was owing to difficulty with the content.

Comments on Individual Questions

Section A

1 **(a)** This was well answered. Most recognised rotation by 90°, although some did not specify the direction. Fewer were able to give the centre of the rotation and some reversed the co-ordinates although they did attempt to identify its position. Few gave more than one transformation, for example, rotation followed by translation and sacrificed marks as a consequence.

(b) Fewer were able to answer this part correctly. The most common answer was to give a half size drawing of triangle A, but in the wrong position. Some attempted the 'ray' method but were inaccurate with their measuring and others had drawn the lines of enlargement but did not make use of them. A few enlarged triangle A by a scale factor of 1·5 or even 2.

(c) This was not well answered. Answers such as 'it contains a right angle', 'the angles are similar', 'it is the same shape', 'it is half the size', were very frequent. Candidates most commonly gave vague statements that simply repeated the original information. A specific reference to angles being the same, or to lengths being in the same ratio, was required.

2 **(a)** Many candidates found this challenging although a number were able to score marks on this question. Linear graphs were common errors in parts (a) and (b). Some also drew a cubic or a parabola in this part. Those that recalled the shape of the graph were sometimes unable to make a reasonable sketch and had the curves curling at the ends or crossing the axes. In this context candidates should be aware that the graphs should be drawn smoothly with special consideration being given to their behaviour at the extremities. Care should also be taken when the graphs approach or cross the axes.

(b) This was tackled better than the reciprocal graph but there were similar errors to those detailed in part (a). Some drew a positive cubic graph but it either had a maximum and minimum, or did not cross the *y*-axis in the positive part of the graph, and they received partial credit as a result. Negative cubic graphs were also seen. If possible, some indication should be given of any numerical values when an axis is crossed.

3 **(a)** Answers were generally good here, with the most common error being an answer of 12×10^8.

(b) A minority were able to use the population of China and the UK to show that the statement was incorrect. A considerable number of candidates gave answers such as 'it would be too big', 'there's not that many people in the world', or 'it's double' with no quantitative evaluation. The best answers stated that the population of China was 20 times bigger. or gave the values for the population of the UK multiplied by 200. or the population of China divided by 200. It was essential that candidates showed that the statement was incorrect with a clearly evaluated calculation.

4 **(a)** There were many very good answers to the addition of the fractions, where the most successful method was to deal with the integers first before adding the two fractional parts by finding a common denominator. Others attempted to convert to improper fractions first before adding but this caused arithmetic errors, often in the conversion to improper fractions, and for others $\frac{13}{4} + \frac{7}{5} = \frac{20}{9}$ was a common error.

A number who made progress could not change $\frac{93}{20}$ to the correct mixed number.

Some struggled with the fraction addition and had limited knowledge and recall of the appropriate method.

5 There were mixed answers here, with the vast majority of candidates unable to obtain a fully correct solution to the simultaneous equations. Many recognised the need to equate a pair of coefficients and attempted to multiply the original equations by appropriate values. There were sometimes arithmetic errors at that stage and also cases where only one or two terms in the equation were multiplied. The next stage caused the most errors, with candidates often choosing the wrong operation to eliminate a variable, for example adding when the equations should by subtracted. Arithmetic errors often occurred at this stage too, with candidates being unable to correctly deal with the directed values when adding or subtracting. A correct answer for either *x* or *y* from a correct algebraic method was rare as a result. A number attempted trial and improvement and a few obtained the correct solutions. In these cases only one mark was given because of the lack of an algebraic method.

This was the most poorly presented question of all by candidates, which could reflect a lack of confidence in the algebraic process required.

6 **(a)** The correct value for the interquartile range was seen very frequently. Other answers included giving a range for the answer 159 – 168. The median was also given sometimes as were the lower quartile reading or the upper quartile reading.

(b) The example given in (a) obviously helped many with the conventions of drawing the box plot, and virtually all that attempted the question drew a recognisable box plot representation. The majority made an accurate drawing and there were many others that were partially correct in placing the five key values. Most common errors were made in misplacing either the maximum or the minimum values or in confusing the median with one of the quartiles.

Section B

7 **(a)(i)** The majority of candidates correctly chose 25000 × 0·68 with most able to give a convincing reason for their choice. A small minority chose 25000 × 0·78 due to an arithmetical slip. The most common wrong answer was 25000 × 0·32.

(ii) Most candidates were able to find the correct value of the caravan after 3 years and used $25000 \times 0{\cdot}68^3$ in 1 or more steps. A few failed to use the hint given in part (a)(i) and used repeated subtraction of 32%, arriving at a value of £1000. Some calculated the value after just one year (£17000).

(b) There were many good answers here, with candidates well prepared with appropriate methodology of division by 1·08 and then able to calculate this reverse percentage. Others made the mistake of multiplying by 0·92 to end up with £1788·48. A few candidates multiplied by 1·08 instead of dividing.

8 **(a)** The majority of candidates were able to give a correct solution to the equation although a few did not show the correct algebraic steps a small number preferring to show a numerical justification. Some were able to gain part marks for correct follow-through of one or more algebraic steps after failing to remove the fraction correctly. It should be emphasised to candidates that correct algebraic steps shown in working on equations gain method marks, even when the answer is incorrect.

(b) There were a number of excellent answers to this but overall, this was slightly disappointing for a standard quadratic equation. Many did try to factorise and often obtained the correct factors but then either did not consider the solutions or gave answers with sign errors. Some attempted to use the quadratic formula and made sign errors in the substitution with the b value of –12. Weaker candidates also showed a trial and improvement method but usually obtained only one of the solutions.
A surprising number of candidates attempted to rearrange the equation to make x the subject and then take a square root and showed little recognition of the quadratic equation.

9 Many of the candidates correctly chose ‘volume’ although fewer of those candidates were able to justify their choice. Some were confused by the inclusion of π and thought this was always part of an area or volume. Some explanations, such as 'there are 3 lengths', were not explicit enough, and others merely observed that there were '3 letters'. A few recognised the similarity to the volume of a cone formula.

10 The stronger candidates tackled this question reasonably well and showed clear written methods and appropriate accuracy. Many other candidates were not able to do this trigonometry question and the multi-step nature of the question was found difficult. Some wrongly tried to use Pythagoras' theorem to find the third side by adding the squares of 6 and 6. A few assumed that the triangle was equilateral, giving an answer of 18. Others did try to use trigonometry but without dividing the triangle into two right-angled triangles, so sin 44, cos 44 and tan 44 were equally likely to be used. Those who used cos 68 rarely used it correctly. A few were able to gain a consolation mark by attempting the perimeter by adding 12 to their BC after using some trigonometry.

11 **(a)** Virtually all candidates were able to score at least 1 mark for completing this tree diagram although some forgot to complete the word labels after the second branch, writing the products of the fractions instead.

(b) Over half of the candidates correctly used $\frac{3}{10} \times \frac{3}{10}$ but not all evaluated it correctly, with $\frac{9}{10}$ or $\frac{9}{20}$ being common wrong answers. There were many who just tried to add $\frac{3}{10}$ and $\frac{3}{10}$.

12 The majority of candidates scored 2 marks for this question but often showed little working. A few forgot to divide by 3, or divided by 4 instead. Some candidates continued adding 4000 to get answers of 96 000 and 100 000, or added 6000 then 8000. 97 000, 104 000 seemed to occur quite frequently, which presumably came from looking at where the given 88 000 and 92 000 came in the table and then repeating a similar positional pattern in the table to find a pair of answers.

B279: Module Test M9

General Comments

Candidates found this paper challenging, particularly the less structured questions and answers requiring explanations. Working was generally included but rarely as a set of logical steps.

All candidates appeared to have sufficient time to complete the paper.

Comments on Individual Questions

Section A

1 **(a)** Many fully correct solutions were seen but a significant number of candidates, having factorised, failed to find the solutions.

(b) Few candidates were able to simplify this expression. Many tried to simply cancel one term in the numerator with the denominator.

2 **(a)** Many candidates earned a method mark in this part for $\frac{3}{9} \times 10^2$ but failed to gain the second mark because they evaluated this as 300. Candidates who wrote both numbers in ordinary form were generally no more successful in simplifying the calculation.

(b) This question was answered well by the more able candidates. Others gained M1 for 121500 or 99350, but weaker candidates were unable to deal with the 3 significant figures and upper bounds of 121500·5, 121005, 12100·5, 121499 were evident. A few thought they needed to multiply the bounds as the question referred to area. Some added and then found the upper bound of their total.

3 This question was well answered, but some candidates needlessly lost marks through sloppy notation. The most common error was to take the square root before dividing by 3. Flow charts were seen on occasion but they were very rarely used successfully.

4 **(a)** This was generally correct. Wrong answers seen were 0 and 5.

(b) Candidates generally reached $1/5^2$ but some failed to record this as 1/25. Common errors were -25, -10 and 0·05

(c) Similarly, some candidates reached $\sqrt{400}$ but failed to record this as 20. An answer of 200 was common.

5 **(a)** Many candidates correctly substituted in the formula but various errors then arose. Some were numeric, eg 72/3 = 14 and 8 × 9 = 71. and many failed to simplify 72/3. Being asked to give the answer in the form $k\pi$ caused much confusion with k often appearing in the working and/or answer.

(b) Only the more able students recognised that this was a question about similar solids, but then they generally failed to use the area scale factor and answers of 218 were common. Some candidates tried to evaluate $\pi \times r \times l$ but they were rarely successful and certainly failed to include the base area.

6 Candidates rarely scored full marks on this question but the majority found the correct value *o*f *x*. Marks were lost because candidates failed to give adequate reasons eg '90 because it is the tangent to circle' with no mention of meeting the radius. A common misconception was to state that triangle ADC was isosceles, then angle DAC was found to be 64°.

7 Many correct solutions were seen but a significant number of candidates did not appreciate the area property of histograms, and simply used the heights as the frequencies. The graph was sometimes misread, particularly with the height of the last column taken as 10 not 9.

Section B

8 **(a)** Most candidates were able to complete the tree diagram but some needlessly used decimals.

(b) Only the better candidates were successful on this part. Others lost marks through including 2 on A and on B, omitting one case. There were also errors in multiplying and adding fractions and using decimals rounded to 1sf.

9 **(a)** Only the stronger students scored this mark. Many simply rewrote the equation.

(b) Some candidates realised that they were dealing with perpendicular lines but very few were able to find the equation. A common wrong answer was $-\frac{1}{3}x + 4$.

10 **(a)** A significant number of candidates scored full marks. Errors included $20x$ and -3.

(b) Stronger students recognised the difference of squares but $(4x - 3y)^2$ was a common error.

11 **(a)** Many candidates scored one mark in this part but were unable to find the *z*-coordinate.

(b) Most candidates recognised that they needed to use Pythagoras' theorem but this was generally in 2 stages rather than 1. Errors arose from miscalculation of the lengths of sides.

(c) Many candidates used the correct trigonometric ratio in this part but full marks were not frequently seen, as incorrect lengths were used.

12 The most successful method was to find the equation from 60 and 0·2 and then check the answer with 15 and 0·4. Few candidates checked with the 3rd pair.

13 This was quite well answered. Few candidates gave non integer answers.

Grade Thresholds

General Certificate of Secondary Education
Mathematics C (Graduated Assessment) (Specification Code J517)
June 2008 Examination Series

Unit Threshold Marks (Module Tests)

Unit		Maximum Mark	a*	a	b	c	d	e	f	g	p	u
B271	Raw	50								30	14	0
	UMS	59								40	20	0
B272	Raw	50							35	20	13	0
	UMS	70							60	40	30	0
B273	Raw	50							26	13		0
	UMS	79							60	40		0
B274	Raw	50						36	20	12		0
	UMS	90						80	60	50		0
B275	Raw	50						32	16			0
	UMS	99						80	60			0
B276	Raw	50					27	14				0
	UMS	119					100	80				0
B277	Raw	50				26	12					0
	UMS	139				120	100					0
B278	Raw	50			31	15						0
	UMS	159			140	120						0
B279	Raw	50		27	13							0
	UMS	179		160	140							0

Notes
The table above shows the raw mark thresholds and the corresponding key uniform scores for each unit entered in the June 2008 session.

Raw marks in between grade boundaries are converted to uniform marks by a linear map. For example, 28 raw marks on unit B275 would score 75 UMS in this series.

The grade shown in the table as 'p' indicates that the candidate has achieved at least the minimum raw mark necessary to access the uniform score scale for that unit but gained insufficient uniform marks to merit a grade 'g'. This avoids having to award such candidates a 'u' grade. Grade 'p' can only be awarded to candidates on B271 (M1) and B272 (M2). It is not a valid grade within GCSE Mathematics and will not be awarded to candidates when they aggregate for the full GCSE (J517).

For a description of how UMS marks are calculated see:
http://www.ocr.org.uk/learners/ums_results.html

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