GCSE EXAMINERS' REPORTS

MATHEMATICS
GCSE

NOVEMBER 2019

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MATHEMATICS

GCSE

November 2019

Foundation: Component 1

General Comments

To do well in this examination, candidates need to interpret each question carefully and make sure they use all given information, particularly key words and phrases, in their solution. Where it is possible candidates should attempt to check their answers. Candidates should check to see if their answer is reasonable using logic and/or estimation. For example, it is not reasonable to suggest that someone has 360 grandchildren or that teachers can choose food from a table at a rate of 171 per minute. Those candidates who present their work in a neat and logical way are generally more successful as they are less likely to make simple errors such as miscopying their own figures.

Many candidates were able to access a good proportion of the questions and syllabus coverage overall seemed to be reasonably good. Candidates were not allowed to use a calculator. Many candidates were able to determine the correct method needed to answer most of the problems set, but were unable to carry out accurate arithmetic and therefore lost accuracy marks. These candidates could clearly improve if their basic arithmetic skills, particularly those involving division, arithmetic with decimals and with fractions were to be strengthened. Some candidates attempted to use partitioning methods to divide and multiply. Occasionally these methods were unsuccessful. For example, in Question 9(a), $2.20 \div 16$ became the sum of $2.20 \div 10 = ...$, $2.20 \div 5 = ...$, $2.20 \div 1 = ...$. For certain questions, some candidates provided many calculations/trials and did not identify their final answer. This was common in Question 8(a) and Question 9(a), for example. Candidates should be aware that they should indicate their answer in some way and are at risk of losing credit if their answer cannot be determined.

All candidates seemed to have sufficient time to answer those questions that were within their capability.

Comments on individual questions/sections

Q.1 Many candidates found this simple assessment of arithmetic skills to be a reasonable start to the examination.

(a) (i) – (iii) Parts (i) and (ii) were generally well answered. In part (iii), some candidates had issues with place value. It was not uncommon to see an answer of 1.061. A few candidates gained some credit by starting correctly with the right hand side, after correctly vertically aligning the decimals, but were unable to deal with the decomposition needed in the tenths position and commonly these candidates gave 1.126 as their answer. A few candidates ignored the decimal point in their working but these often omitted to reinsert it in their answer.

(b) A good number of candidates were able to use the information given and deduce the correct value, as expected. Those candidates who ignored the given information and decided to carry out the long multiplication for the one mark on offer were rarely successful.

(c) This part was generally well answered.

Q.2 (a) Again a good number of correct answers were seen to this part. On occasion, candidates marked the arrow at 0.5 or 0.75.

(b) By contrast, this part was not well answered. Some candidates focussed all their attention on the number line but were unable to make the correct deduction that two of the values on the spinner had to be less than 4. A very common incorrect answer was 1, 2, 3, 4, 5.

(c) This was very well answered with the vast majority of candidates offering the correct value. Occasional arithmetic slips were seen following 1 – 0.7.

Q.3 (a) Candidates struggled to find the correct solution here. A few candidates were able to complete the diagram correctly, but this was quite rare. Many candidates drew either a ⊢ shape or a ⌴ shape.

(b) Candidates found this part more challenging. Those who attempted to answer sometimes drew accurate ruled triangles, as expected. Others made freehand sketches that were not accepted, or reduced the size of the triangle in some way. Some candidates made an accurate drawing much more difficult than was necessary by not using the intersection of the grid lines to form the right angle.

Q.4 (a) A reasonably good number of candidates were able to apply the correct order of correct operations in this part and scored both marks. Some candidates had difficulty in dividing 800 by 5 and so lost the accuracy mark. Some other candidates applied an incorrect order of operations and the answer 180 was commonly offered in these cases.

(b) In this part, it was far more common for the wrong operations or for an incorrect order of operations to be applied. Answers of 1900, from $5 \times 400 - 100$ and 180 from $400 \div 5 + 100$ were often seen. Quite a few candidates resorted to trials. Some were successful but the vast majority trying this approach were not.

Q.5 (a) (i) – (iii) Most candidates were able to find correct answers to part (i) and part (ii). A reasonable number were also correct in part (iii). Occasionally, candidates used -3 as the input in part (iii) and offered -11 or -1 as answers. Sometimes candidates took the correct first step, adding 5, but then multiplied by 2 instead of dividing. A few candidates were unable to cope with $-3 + 5$ and some were unable to find $2 \div 2$, with 0 being common in these cases.

(b) This was generally very well answered. Few candidates selected an incorrect rule. Those who did so usually chose $x = \frac{y}{2} + 3$ or $\frac{x+3}{2} = y$.

Q.6 This question was very well answered.

(a) (i) – (ii) Candidates usually showed good understanding of what was needed for the range, with very few candidates offering 22 – 12 as their final answer. A few candidates did not select the maximum and minimum values and a few others found an average rather than the range in part(i). In part (ii) candidates commonly correctly added all 6 values and attempted to divide by 6. The division was often carried out successfully, although a few errors were seen.

Q.6 (b) (i) – (ii) Again, most candidates were able to indicate a correct order of values for part (i). In part (ii) many were able to calculate that 1100 extra people needed to be housed. Many knew that they then needed to divide this by 4. A good number were able to do so correctly although, again, a few errors were seen at this stage. A few candidates misinterpreted the question or table and chose either the population of Copley or Pinestow in this part. These candidates could gain partial credit for correct method and a correct answer following their error. This included rounding the number of houses needed up to the next integer.

Q.7 (a) (i) – (iii) This question was a simple assessment of working with directed numbers. Part (i) was very well answered, with few incorrect selections made. Candidates found part (ii) to be a little more problematic in terms of arithmetic, with the answers -2.5 or 2.5 being fairly common. They were more successful in part (iii), although a few answers of 5 or -6 were seen.

(b) (i) – (iii) A good proportion of candidates were successful in all three parts. A few candidates chose the wrong option in part (iii). Some were not sufficiently accurate with their reading of values to be credited. It was only necessary to convert one value so that both were in same unit. A few candidates converted both and made an unfortunate error with one.

Q.8 (a) Candidates found this to be the most challenging of all the money-based questions on the paper. A few fully correct answers were seen, but these were not common. Several misinterpretations and miscalculations were seen. A few candidates found £320 as the reduced cost of the tablets but did not attempt to add any postage. Some of these candidates made comments such as 'no delivery charge as it is not included in the offer.' Some candidates found the cost of posting one laptop only. Other candidates reduced the cost of one laptop by a third and then added £240 to that, and then the postage. These candidates misinterpreted the offer as 'buy one and get a third off the second' and may have benefitted from rereading the information given. Many candidates did not appreciate that finding the discount as $\frac{1}{3}$ of 480 meant they needed to calculate $480 \div 3$. These candidates resorted to using percentages. Whilst this was not accepted as equivalent to finding $\frac{1}{3}$ of 480, candidates who did this could gain credit for dealing successfully with the postage if they had used a reasonable percentage such as 33%, for example, instead of $\frac{1}{3}$. A fair few candidates found $\frac{1}{3}$ of 480 = 160 and then added the postage to this value. This was not reasonable, as they were adding the postage cost to the discount and this was not accepted. A few candidates added the postage to £480 and then attempted to find a third of this and subtract. This was not common and rarely successful as the arithmetic required defeated most that attempted it.

(b) A reasonably good number of candidates found £432 and doubled their answer. However, many candidates, after finding £432, halved it and gave the answer £648 or halved £108 and gave the answer £486. Weaker candidates tended to divide £108 by 4 as an initial step.

Q.9 (a) It was expected that candidates would use common factors or multiples of 16 and 24 when answering this question. For example, it was relatively easy to find the cost of 48 tablets using each size of bottle and compare. However, very few candidates used this kind of approach to give a complete answer. Many candidates attempted to find the cost of 1 tablet from each bottle. Whilst this was not an incorrect approach, it made the solution more difficult and many candidates who tried it were not able to carry out the divisions required sufficiently accurately enough. Some candidates tried to use partitioning methods here but, instead of using the factors of the divisor 16 for example, candidates were using values that summed to 16, as described in the general comments.

(b) Whilst a good number of candidates seemed to have determined a correct method, there were many arithmetic slips in this question. It was more common for candidates to try to use the volumes of the boxes to find a solution, rather than looking at how many of each small box could fit along each edge of the larger box, which was a little more sophisticated in thinking, but easier arithmetically. Those using volumes often were unable to find, for example, $40 \times 60 \times 10 = 24000$. Commonly 2400 was offered. Some candidates stated $40 \times 60 \times 10$ and $8 \times 3 \times 5$ but made no link between the two calculations and were unable to score. A few candidates offered the number of small boxes as their final answer. These candidates may have realised, if they had reread the question, that they had made no use of the 3600 given. Those who were able to derive the number of small boxes which could be packed into the large box often were unable to complete the necessary division correctly.

Q.10 (a) This part was generally well-answered.

(b) Several candidates attempted to find sunrise times rather than sunset times. A few candidates stated an answer of 19:33. A good number of correct times were stated.

(c) (i) – (ii) A high proportion of candidates stated the correct answer, July, in part (i). In part (ii), fewer were able to derive the correct duration. Many earned a mark for an attempt to find the correct duration following the month they had selected in part (i). A few candidates needed to take a little more care when reading the values from the graph as, on occasion, the sunrise time for one month and the sunset time for a different month were used.

Q.11 (a) Most candidates were able to plot all points correctly. A few candidates lost concentration part of the way through and reversed the order of the last few points. Some candidates plotted points at (4, 0), (0, 7), (9, 0), (0, 9) and so on, misinterpreting the representation of bivariate data.

(b) The relationship stated needed to be ‘positive correlation’ or a narrative description of positive correlation, such as ‘the more it rained in Anstown, the more it rained in Beeham’. A small number of candidates were able to produce a creditworthy answer. Many answers, however, were a comparison of the amounts of rainfall in the two places or a description of how each increased and decreased in parallel, rather than a relationship between them.

(c) A reasonably good number of correct answers were seen. However, 5 was a very common incorrect answer. This seemed to arise when candidates boxed the bottom left hand side of the data using the vertical and horizontal lines at 11 and then counted the points remaining outside this box.

Q.12 (a) A reasonable number of candidates earned both marks, but many more earned one mark for a correctly converted length, usually $RQ = 2$ km. A few candidates needed to read the question more carefully, as some attempted to find the difference between RQ and PQ.

(b) Candidates seem to find bearings difficult to master. This question was no exception. Angles were not usually stated and correct bearings, although seen, were very rare. It was very common to see the answer 3.5 km here, this being the actual distance between P and Q.

(c) A good number of candidates were able to interpret the distance from R needing to be 5 cm on the diagram and earn a mark for a point which satisfied that criterion. Far fewer candidates were able to interpret the direction 'south-west of Q' correctly and fully correct answers were not common. The airport was sometimes on the extension of the line PQ, although other random directions were also seen.

Q.13 (a) Those candidates who showed understanding that the 15 children in Australia were $\frac{5}{7}$ of all the grandchildren were the most successful here. The many candidates who tried $15 \div 2 \times 7$ were not. These candidates should have been alerted to an error in their method by the non-integer answer they found. Some correct methods were spoiled by incorrect arithmetic.

(b) Candidates were much more successful in this part of the question. A good proportion of candidates earned all 3 marks. A reasonable number earned 2 marks and the lack of accuracy was usually caused by the inability to find 400×1.7 correctly. Most remaining candidates were able to earn a mark for stating that in 2016 she received A$800.

Q.14 (a) The key to this part of the question was to divide 560 in the ratio 5 : 3. Many candidates were able to do this successfully, although a few stated 5 + 3 = 7, possibly 'thinking ahead'. The most common method, from candidates making progress, was to then find the cost of each drink and sum. A good number earned all 4 marks this way, although accuracy was sometimes lost when dividing 560 by 8 or when finding 210×1.50. An alternative method, although less common, was to find the total cost of 5 cups of tea and 3 cups of coffee as £9.50 and then multiply by 70. Presentation of work was often poor in this part of the question, with calculations positioned haphazardly on the page. It would be helpful if candidates wrote down the calculations they were attempting to evaluate before they tried to find them.

(b) A good number of fully correct answers were seen, although, once again, some solutions were spoiled by arithmetic errors such as $5 \times 8 = 32$ and $5 \times 4 = 25$. The two possible approaches – first finding the number in 5 minutes and then changing to a rate per minute or first finding the rate for all teachers per minute and then subtracting the given rates – were equally popular. A few candidates muddled the methods and found 95 – 12 = 87. Checking how reasonable this is likely to be or comparing the rate to the given rates, for example, should have indicated that this was unlikely to be correct. A few candidates thought the numbers formed a sequence: 8, 4, 2 and gave 2 as their answer.

Q.15 (a) Solutions to this problem were varied. A reasonable number were able to find $\frac{3}{5}$ of 45. Far fewer candidates were able to use the information in the second bullet point correctly and a common error was to divide 45 by 2 rather than by 3. Some candidates found 18 and 27 in the bottom row of the table and then, using the information in the third bullet point incorrectly, found $\frac{1}{6}$ of 18. Very few candidates understood that, as they had been asked for a proportion, the answer should be given as a fraction. Many candidates offered a frequency instead.

Q.15 (b) Candidates were far more confident in this part and many seemed to have a good understanding of what was needed. Again, some candidates were unable to find $18 \div 3$ or 6×8 correctly, but their method was otherwise correct. A few candidates found the number of swimmers as 48 and offered that as their answer and were able to gain some credit. Weaker candidates sometimes tried to find 3×18 and gave the answer as 72.

Q.16 Candidates found this very challenging, with very few able to earn any marks at all. Although rare, correct answers were seen and a few candidates were able to earn at least a mark for one correct operation. The answer $y - 3 \times 4 = x$, from an incorrect order of operations, was very common, as was $x = \frac{y+3}{4}$, from simply swopping the *x* and *y*.

Q.17 Candidates found the whole of this question to be very challenging and very little progress was made in any part. Many candidates made no attempt to answer any part.

(a) (i) – (ii) Part (i) was the most successfully answered part of the question with a fairly reasonable number of correct answers seen. Common misinterpretations of the notation were 0.00048, 0.048, 000.48, 4800 and 48000. In part (ii), a few candidates summed 2.5 and 9 correctly but then wrote 11.500000000..... as their answer and could not be credited. Other common answers, when seen, were 11.5×10^{40}, 34×10^{40} and 3.4×10^{40}. A few candidates attempted to write each value as an ordinary number. This was not an efficient approach and met with very little success.

(b) Again, candidates found this question to be challenging. Of those candidates that attempted to answer, most did not estimate the values given, as required. Those that did sometimes wrote the values as 3×60 and 2×60. Few candidates determined the correct method was to divide the volume by the surface area and, commonly, candidates added, subtracted or multiplied instead. Candidates could have gained some credit for understanding that the depth of the ice, being a length, would be measured in kilometres, the volume and surface area having been given in km^3 and km^2 respectively. However, very few candidates were able to take advantage of this opportunity.

Q.18 (a) – (b) This question was very well answered, with the majority of candidates able to produce sensible reasons and criticisms. On occasion, comments were not sufficiently clear or were repeated. A few comments were not specific to the plan given, as was required, and could not be credited.

Q.19 Responses to this question were variable. Many candidates were able to identify the side elevation as a rectangle, although few drew an accurate rectangle with correct dimensions. Many found the plan to be challenging, with some attempting to draw elliptical shapes. Few circles were attempted. Other candidates drew a 'rectangle' with curved top and bottom edges, copying the image in 3D. A few candidates attempted to draw diagrams that resembled nets. There were many freehand sketches, the key words 'draw accurately' being overlooked.

Q.20 (a) A small number of candidates gave fully correct solutions to this part of the question. Commonly, these candidates subtracted 27 as a first step and then found $725 \div 25$, sometimes using a build-up approach. Some candidates attempted trials. This was a reasonable approach in this case. It was notable however that many candidates deleted trials that were unsuccessful rather than just indicating that they did not work. This is not sensible when trying to solve using this approach, as all the trials form part of the solution. Weaker candidates tended to multiply 752 by either 25 or $25 \cdot 27$ or 52 (from 25 + 27).

Q.20 (b)(i) Good candidates understood that as the number of guests increased, the number of days for which the food would last should decrease. Candidates who were experienced in assessing the reasonableness of an answer should have found this to be a simple deduction. The explanation needed to be complete and clear. Comments such as 'You have to multiply not divide,' were unclear and not accepted. Some candidates focussed on the values used rather than the general concepts and these often gave insufficiently clear explanations to gain credit. Weaker candidates tended to restate Huw's working or comment on it. For example, comments such as 'He thinks that with 10 guests it will be 3 days extra,' or 'How can it last 10 guests 3 days when it lasts 20 guests 6 days?' were made. Some candidates thought that Huw's working was correct and indicated this.

Q.20 (b)(ii) A few candidates were able to earn both marks. A few other candidates were able to earn one mark for a correct statement, such as 10 guests would be 12 days or a correct method, $\frac{20\times 6}{30}$. Very commonly, the answer 3 was offered by weaker candidates from the calculation 6 – 3. Even though candidates had been told in the previous part of the question that the answer 9 days was incorrect, many stated that as the answer in this part.

Q.21 Candidates generally find working with fractions to be challenging and this question proved to be no exception to that. Some candidates were able to find a correct pair of improper fractions but were unable to combine them correctly. Most candidates were unable to convert to a useful form correctly. A few candidates gave the answers $-3\frac{8}{16}$ and/or $7\frac{10}{24}$. Most candidates only attempted one of the two possible calculations. Quite a few candidates attempted to convert to decimals, which often did not help them as the conversion was commonly incorrect.

Q.22 In order to make any progress, candidates needed to apply Pythagoras' theorem to triangle *ABD*. A very small number of candidates understood this and were able to find *BD* as 10 cm. Most of these candidates then went on, using the fact that triangle *BDC* was isosceles, to state that *x* was 45°. Most candidates made no attempt to use Pythagoras and either calculated the area of *ABD* or used angles only, making the assumption that *x* was 45°, without justification. This was not accepted.

Q.23 Candidates found this question to be very challenging and it was often omitted. Commonly, those candidates who made an attempt to answer, stated pairs of coordinates and then wrote $y = -3x + 9$ or similar.

Q.24 (a) This was a routine question and should not have posed too great a challenge for candidates. However, only a small number of candidates offered fully correct solutions to this part. Candidates who kept the equation form throughout tended to perform better than those who separated the terms whilst they collected them. Those candidates who collected the *x* terms and the constants separately, losing the equation form, tended not to recompose the equation in order to solve it.

(b) Very few correct answers were seen here. Those candidates who multiplied the second equation by 2 in order to eliminate the *x* terms made the solution more complicated than necessary and often made sign errors. A small number of candidates found the value of *x* but omitted to go on and also find the value of *y*. Candidates who attempted trials were rarely successful. Many candidates made no attempt to answer.

Q.24 (c) Some candidates gave neat and fully correct representations of the given inequality. A few candidates had lines of correct length and position but, as well as having solid circles at each end, also had arrows and this was not condoned. It was expected that candidates would use solid circles, as is conventional in representations of this type of inequality and vertical lines or empty circles were not accepted at the ends of the line.

(d) Again, a few correct answers were seen. Those who attempted a solution, on occasion, offered $6x < 12$ as a first step. Those candidates using '=' to solve often did not replace the '=' by the correct inequality sign. This method commonly resulted in candidates not gaining marks they might otherwise have earned.

Q.25 The key to solving this problem was to appreciate that the only possible numbers were 1, 1, 1. Very few candidates understood this. Some could not find any odd scores and gave the answer 0. Some candidates based their answers on one dart only and gave the answer $\frac{2}{4}$ or 50%. The few candidates who were able to deduce that 1, 1, 1 gave the only odd score often were unable to find the correct probability. The correct calculation, $\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}$, was rarely stated.

Summary of key points

- Candidates who make several attempts at a solution should take care to indicate which attempt is their final answer.
- When trials are attempted, it is important that trials that are unsuccessful are not deleted as they are part of the process. Candidates should simply place a cross beside any unsuccessful trial.
- When an explanation is required, some interpretation or justification is expected and a restatement of facts or figures is usually insufficient.
- Generally candidates had a reasonable understanding of what method needed to be used. However, their arithmetic skills were not always good enough for accurate answers to be given.
- Arithmetic skills were reasonably sound when working with integers. However, improvements might still be made in the areas of division, arithmetic with decimals, with fractions and with numbers in standard form.

MATHEMATICS

GCSE

November 2019

Foundation: Component 2

General Comments

The paper seems to have given candidates confidence, in that they were able to access many questions at various stages, whilst also being tested on more challenging questions throughout the paper. However, as this is the resit paper, there have not been the extremes in the marks, the weakest candidates seemed able to reach around 30 marks, but very few managed to score higher than 80 marks.

Comments on individual questions/sections

Q.1 This question provided a comfortable start for most candidates. Most were able to interpret the table, select the correct values and perform the necessary calculations. There were occasional slips in parts (b) and (c).

Q.2 In (a), many candidates gained one mark out of the possible two, for giving the correct name for two circle parts. It was common for candidates not to remember the 'chord'.

In (b), most managed to draw a triangle, but the accuracy was often disappointing, with either the 90 degrees or the 6.5cm incorrectly drawn.

Q.3 Parts (a) and (b) were straight forward, naming/recognising 3D shapes from a net or description. However, whilst most managed to match the triangular prism in (b), they often confused the cube for a cuboid in (a).

Q.4 In (a) candidates were asked to complete a diagram and give the coordinates of their point. In (b) they had to reflect a given point in the y axis, and again give the coordinates, this time with a negative x value. Part (a) was usually done correctly with correct coordinates given, but there were occasional slips of reversed coordinates. Some candidates were able to have a mark in (b) if they gave a correct negative coordinate of an incorrect point.

Q.5 In this question, candidates were required to calculate the area of a rectangle. Inevitably, some calculated the perimeter instead. There was also a mark here for rounding the answer to the nearest 10, which was sometimes missed by candidates.

In part (b) candidates were expected to realise that decimal answers do not always round down, as, in this case, rounding up would be more appropriate, to avoid running out of paint. Many managed to do this well.

Q.6 Candidates had varying degrees of success with this question. Not all of them read and understood the information given at the top of the question.

In b(ii), whilst some candidates coped well with explaining that because February has fewer days, they need to multiply by 13, or the weekly amount by 52, many were confused in their explanations.

Part (c) was probably the most successful part of the question. Occasionally candidates forgot to answer the question (saying that yes, Aled has enough because….)

Q.7 This question, interpreting and carrying out calculations from information in a table, worked well for many candidates. Some slips were made in (b) from missing the addition of the £25 bonus.

Q.8 Part (a) of this question was well answered. Most candidates were able to interpret the given bar chart and frequency table and then correctly complete the missing parts.

In part (b), candidates were asked to calculate an angle required if they were to draw a pie chart. Many candidates found this challenging. Most were able to give the probability of one of the pets in the table.

Q.9 Many of the candidates made a good attempt at this basic algebra question.
In a(i) occasional slips with '-7' instead of '7'.
In (c) candidates attempted to substitute but many did not engage with the algebraic notation correctly, and did '-2 + 63' instead of '-2 + 6 x 3'.

Q.10 There were very few problems with (a).

In (b) there were various issues with writing the large number in words, some missed the hundred or the thousand from 'hundred thousand' and because it is a 7-digit number, some gave the answer as 'billion' instead of 'million'.

The hardest part for candidates was (c), two stages required, finding 48% of the households AND then how much they owed.

In part (d), candidates needed to be careful that they did not incorrectly simplify a correct fraction. The answer here did not require simplifying.

Q.11 Part (a), nearly every candidate attempted this question, however not all realised that the length scale factor was required.

Generally, candidates found part (b) most difficult, having numbers larger than usual seems to have put many off. Many then went on to do part (c) correctly. One of the biggest issues in (c) was candidates not realising that the £4.95 was the price for HALF a litre.

Q.12 Not all candidates were able to interpret what they were being asked for, for example, 'angle *BDE*' is the angle at D. More candidates should be encouraged to record their angles on the diagram, some were able to gain marks from doing this. Sadly, not everyone recognised a trapezium, the common wrong answers were 'rhombus' and 'parallelogram'.

Q.13 This multi-step, largely unstructured question proved to be a challenge for many candidates, the proportion getting all 7 marks was relatively small. Common mistakes were from only using one standard class carriage rather than the 4 carriages stated in the introduction to the question. There were varying degrees of success in calculating the fractions of amounts.

Candidates needed to be able to interpret their answer, comparing the fraction of the train that is full with the fraction 2/3.

In (b), many managed to correctly calculate the time using distance and speed. However, the answer, 1.25 hours needed to be converted into hours and minutes (1h15m) before adding the times to reach the final answer.

The final part (ii) was an easy mark for many at this stage of the paper.

Q.14 This was a heavily in-context percentages question. Many were able to calculate one or other of the estate agent fees, but not many scored all marks in part (a).

In part (b), few candidates were able to answer this, despite being given an example from the Government website. There were a lot of words in this part of the question, and this may have contributed to its low answer rate, along with the calculations of small percentages of large numbers.

Q.15 This was just finding the perimeter of an L shape, with algebraic side lengths, and two missing sides. There were many candidates who missed the 'missing' sides or made errors in finding both missing sides. A common error was to assume that the missing sides were half of the length and width. Candidates need to note that diagrams such as this, are not drawn to scale.

Q.16* A lot of years; candidates need to learn the formula method for calculating the amount following compound interest.

Q.17* Candidates need to read instructions carefully, this question required the formation of an equation and then the solving of it.

Q.18* A mixture of responses here – not everyone spotted the need to convert 64km/h to mph first, then do the respective 20% and 30% calculations.

Q.19* A straightforward algebra question, expanding 2 brackets, some good answers were seen, but this is a skill more foundation candidates should have.

Q.20* Those who could and those who could not do this question are fairly polarised. (a) and (c) are slightly different to what has come before, but part (b), estimating the mean of grouped data, is a standard technique.

Q.21* There were very few correct responses to either (a) or (b).

In part (a), the lengths of two sides of the right angled triangle needed to be calculated before trigonometry could be used to calculate the angle.

Part (b), was a relatively simple 'similar shapes' question, but it did require candidates to refer to the diagram on the opposite page.

Q.22* For a large number of candidates, this was a pleasant finish to the paper, with many of those who were still going at this stage managing to score at least some of the marks.

Summary of key points

- Candidates need to persevere to the end of the paper, as marks can be scored in part marks questions anywhere between the first and last page.

- Even though this is a 'calculator allowed' paper, it is important to show workings, so that method marks can be awarded even if the answer is not fully correct.

MATHEMATICS

GCSE

November 2019

Higher: Component 1

General Comments

To do well in this examination, candidates need to interpret each question carefully and make sure they use all given information, including key words and phrases, in their solution. Sometimes solutions are offered that are incomplete or that do not answer the question. This may be avoided if candidates are encouraged to read the question again once they believe they have completed their solution. For example, in Question 15(a), a probability tree was required, not a frequency tree as offered by many candidates. Those candidates who present their work in a neat and logical way are generally more successful as they are less likely to make simple errors such as miscopying their own figures.

All candidates seemed to have sufficient time to answer those questions that were within their capability.

The November series is a resit opportunity only, so as expected, the number of entries was low. Comments on the common questions (1, 2, 4, 6, 7, 8 and 9) can be found in the foundation tier report.

Comments on individual questions/sections

Q.5 (a) A reasonable number of fully correct solutions were offered. Some candidates made arithmetic slips when finding ¼ of £69. Many candidates were able to deal with the 2% for 1 year without difficulty. Far fewer were able to make progress with the extra 3 months. Some candidates divided £69 by 3, instead of 4. Those dividing by 12 and multiplying by 3 were more successful. A few candidates attempted to apply the method of finding compound interest, rather than simple interest.

(b) A variety of methods were attempted, some more successful than others. Candidates starting from $\frac{65\times r\times 5}{100}=9.75$ were usually successful. Many candidates earned a mark for finding that the interest per year was £1.95. Most of these candidates were unable to make progress once they had found this, although occasionally $\frac{1.95}{65}\times 100$ was seen. Again, a few candidates attempted to apply the method of finding compound interest, rather than simple interest.

Q.10 Candidates found this question to be challenging and not all candidates made use of all the information that had been given. A few candidates earned marks for correctly finding the length and width of the pond and flowerbed. The length of the hedge was more problematic for them, with fewer finding the correct value. Use of 13×1.2 was seen on more than one occasion. Some candidates assumed that all of the grass was of the same width so used 2 m when they needed to use 2.8 m. These candidates had often not found the length of the hedge. A few candidates thought that the pond was 7 m by 4 m, ignoring the information given about the relationship between the gate and the length of the pond. Some candidates were able to find the length of the pond as 8 m but made no progress beyond that. Few candidates used a correct strategy to find the area of the grass once the dimensions they needed had been found.

Q.15 Better candidates produced perfectly correct probability trees in part (a) and used them to successfully answer part (b). A few candidates clearly understood that the number of grapes had reduced to 9 when the second grape was chosen, but did not always correctly figure out how many of each colour of grape remained to choose from. Some candidates gave probabilities that were based on Vera replacing the first grape as all denominators were 10. Many candidates did not attempt probability trees, as required, but instead gave frequency trees. These were not accepted in part (a) and neither were the frequencies that resulted as answers in part (b).

Q.18 (a) It was expected that candidates would form the factors from the roots given in the diagram and then use the *y*-intercept to check for any multiplying factor required. Many candidates thought that they were finding the equation of a straight line and $y = mx + c$ was often stated. Those who did attempt to find a quadratic expression usually were unable to interpret the roots and *y*-intercept correctly. For example, $4x^2 - 8$, $x^2 - 1 + 4 - 8 = x^2 - 1x + 4x - 8$ and $x^2 - 4x - 8$ were all seen.

(b) Occasionally correct answers were seen and had been derived from correct working. Most commonly, the answer $k = 1$ was offered, without working. On occasion, candidates tried to find the gradient of either a chord or a tangent.

Q.21 A good diagram would have been very useful in this question but few candidates attempted to draw any diagram at all. Some candidates were rewarded for knowing that the radius was 7. Very few candidates concluded that *AB* was a diameter of the circle and therefore was 14. A diagram would certainly have helped candidates to understand what was needed in part (b), which was poorly answered when any attempt was made.

Q.23 It was expected that candidates should use 4 trapezia, or the equivalent in triangles and rectangles, to find an efficient estimate of the area under the curve. The trapezia should have been formed using points on the graph and some candidates were able to do this correctly and find the value expected. A few candidates used less efficient estimates based on trapezia that were not all formed using points on the graph or based on rectangles. Those who used 4 strips of equal width gained a strategy mark. Those using trapezia or the equivalent in triangles and rectangles, gained further credit. Using the sum of 4 rectangles was penalised as the solution produced was much simpler than that using trapezia. Weaker candidates estimated using a 17 by 8 rectangle or counted squares, for example, neither of these methods was acceptable.

Comments made in part (b) needed to be based on an attempt to find the area using 4 vertical strips in part (a). A few candidates were able to make sensible comments on this basis.

Summary of key points

- Candidates should take care to ensure they use all the information given in a question in their solution. Omitting to use a key point generally results in full credit not being awarded.
- When more than one mark is available for a question, method should always be shown. The more marks there are, the more steps there are likely to be in the method.
- When an explanation is required, some interpretation or justification is expected and a restatement of facts or figures is usually insufficient.
- Arithmetic skills were reasonably sound when working with integers and decimals. Addition and subtraction of mixed numbers, evaluation of terms in index form and working with values in standard form were much less secure.

MATHEMATICS

GCSE

November 2019

Higher: Component 2

General Comments

The paper was set to differentiate, with different styles of questions and a graduation in the level of difficulty.

Item level data is available to all centres by centre and for individual candidates with comparison of all candidates sitting these examinations. This report will focus on common errors and misconceptions to aid the interpretation of the data available rather than focus on whether each question was well answered or not.

Comments on individual questions/sections

In question 2, candidates were asked to form an equation, so trial and improvement to find the angle was not accepted.

In question 3, although candidates were given the conversion 50 mph is 80 km/h, most were unable to apply it correctly.

A number of these candidates attempted question 5(b), some with knowledge of how to calculate an estimate of the mean.

Many of these candidates did not have knowledge of trigonometry, needed in question 6 and question 14.

Few candidates had knowledge of circles in question 7(c) and question 9(b).

Few candidates had any knowledge of vectors in question 11.

Summary of key points

Of the weaknesses in candidate understanding and knowledge, the following stand out from this examination:

- Lack of knowledge, of these November entry candidates, of basic algebra, number, proportion, measures and geometry.
- The lack of understanding, of these candidates, of the fact that a diameter is double a radius and how to calculate circumference and area of a circle.
- The inability of these candidates' to express two values as a fraction or a percentage.

WJEC
245 Western Avenue
Cardiff CF5 2YX
Tel No 029 2026 5000
Fax 029 2057 5994
E-mail: exams@wjec.co.uk
website: www.wjec.co.uk