



GCSE EXAMINERS' REPORTS

MATHEMATICS (NEW)

NOVEMBER 2017

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MATHEMATICS (NEW)

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November 2017

COMPONENT 1 – FOUNDATION

To succeed in this examination, candidates needed to show sufficient method so that marks could be awarded, even when the final answer was not correct. It was important that method was shown for any solution that required more than one step. Candidates needed to make sure that they read each question carefully and paid careful attention to key words and phrases. It is also always a good idea if candidates reread the question once they have completed their solution to check that they have answered all that is required. Candidates who presented their work neatly were less likely to make errors such as miscopying their own writing.

Candidates were clearly well prepared for some parts of this examination paper, although some candidates seemed unfamiliar with a few topics - for example vectors and working with multiples of π . The use of a calculator was not allowed and better candidates showed reasonable arithmetic skills. Weaker candidates could clearly improve their arithmetic skills, particularly those involving decimals and fractions, were to be strengthened.

Candidates performed reasonably well on routine questions but were less able to identify a correct method of solution to problem-solving questions. Some questions involved candidates making some type of comment to either describe an assumption or an error in a solution. Many candidates found this quite challenging. For example, they did not seem to realise that restating information they were given in the question was not a valid assumption.

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

Question		Comments
1		Many candidates found this an accessible start to the examination.
	(a)	A reasonable proportion of candidates applied the correct order of operations and stated the correct answer, 23. The common wrong answer was $7 \times 5 = 35$.
	(b)	Some excellent answers were offered for this part – it was not necessary to simplify the fraction to its lowest terms, although many candidates did so correctly. Some candidates would have improved if they had had better recall/understanding of the factors of 36 or multiplication tables. Other candidates may have improved if they had written something along the lines of $\frac{4^{\pm 2}}{36^{\pm 2}} = \frac{2}{18}$ as a few candidates did not divide both numerator and denominator by a consistent value.
	(c)	More candidates found this part of the question a challenge. A good proportion of candidates stated the correct percentage, nevertheless. These candidates tended to work with equivalent fractions, writing $\frac{55}{100} = 55\%$. Common incorrect answers were 11% or values obtained by attempts to divide 11 by 20, incorrectly.

	(d)	Again, a good proportion of correct answers were seen. Candidates who divided 14 by 7 correctly most often went on to give the correct final answer. Some candidates were a little muddled in their thinking. For example, ' $3 \times 14 = 42$, $14 \div 7 = 2$ answer is 44' was offered as a solution on more than one occasion.
	(e)	A small proportion of candidates found the correct answer to this part. Some candidates adopted a strategy of multiplying the numerator by 10 and then giving the answer as 30, omitting to divide by 10 to reverse their initial step. This was not credited as it should have been clear that multiplying by 0.5 and then dividing by 5 should not have left 30 unchanged. Candidates who efficiently interpreted 30×0.5 as $\frac{1}{2}$ of 30 were most successful.
2	(a) (i)&(ii)	This question assessed candidates' recall of the vocabulary associated with the circle. A good number of candidates recalled that AB was a chord of the circle. A reasonably good number of candidates drew the correct diameter, starting from A . Some candidates drew a diameter other than AC . Other candidates drew a chord AC or a radius.
	(b)	Again, a good number of candidates had sufficient knowledge and arithmetic skills to earn all 4 marks here. A few candidates lost marks because of arithmetic errors – with 275° for w and 135° for x being the result of the most common arithmetic slips. Other candidates made method slips such as thinking angles round a point summed to 180° or that x was 95° , treating it as an alternate angle with the 95° given. Most candidates were able to identify y as 30° using the interior angle sum of a triangle, although a few incorrectly attempted to use the values of w and x in some way. Some candidates needed to take a little more care as, on more than one occasion, candidates had the correct set of angles in their working but recorded them in the wrong answer spaces.
3	(a)	A high proportion of candidates earned full marks here. The most common wrong answer was $\frac{3}{4}$, 76%, 0.08, with candidates thinking that 0.08 was 80%.
	(b)	Candidates who read the question carefully were often successful in answering this question, with many of these earning full marks. Some candidates misread the question and calculated $\frac{1}{4}$ of 200 and then 30% of 150. A good number of candidates knew that $200 \div 4$ was 50 and many were able to find 10% and hence 30% of 200 and complete the solution. A few candidates attempted to change $\frac{1}{4}$ to a percentage and this was not always done correctly – 40% was sometimes stated. This was not a particularly successful strategy as, being unnecessary, it increased the likelihood of an error being made.
4	(a)	A good number of candidates were able to give a sufficiently clear explanation of why Theo was correct. Mostly, these candidates showed the cost of the sandwiches to be £15.03 and justified the statement by a comment such as '£15.03 does not end in 5 or 0.' or tried to divide £15.03 by 5 and commented that it could not be done. Some candidates were just restating information given in the question without interpretation – for example, stating 'It cannot be £18.03' without further comment.
	(b)	About half of candidates read the question correctly and understood that 4 cans of lemon fizz would be free. They then went on to, almost always, complete the solution correctly. The remaining candidates took no notice of the special offer, subtracting £5.25 from £9.45 and, usually, dividing that by 4.
5	(a)	Most candidates recalled that a hexagon had 6 sides. A small proportion of candidates were able to draw a hexagon that met the requirement of having only one line of symmetry, such as an L-shape. However, the most common answer was a regular hexagon. A few candidates drew an octagon. Some candidates misunderstood the information about the line of symmetry and drew a pair of hexagons with a mirror line between them.

	(b) (i)&(ii)	Many candidates showed that they were able to use geometric instruments correctly. A reasonable number of candidates scored 2 marks with a good number being awarded one mark for a correct length or angle or for a parallel line. The most common incorrect measurement, amongst candidates scoring 1 mark, was the angle, which was sometimes more than 5° out. Some candidates would have improved if they had taken more care over the accuracy of their drawing. For example some did not close their quadrilateral at the corners. Other candidates only drew the side CD and had a completely open shape. A few candidates drew an isosceles trapezium, rather than a parallelogram. Candidates often did not recall the name, parallelogram, even when they had drawn it correctly.
6	(a)(i) (a)(ii) (a)(iii) (b)	Mostly correctly answered, although some candidates were unable to subtract 5 from 54 correctly. About half of candidates gave the correct value here. The very common wrong answer was -7. A reasonable number of candidates were correct in this part. Some candidates used one correct inverse operation only. Other candidates used 19 as the input rather than the output. This part needed much more thought than the standard work of part (a). Candidates were asked for examples. Some candidates understood the need to test both odd and even values and used clearly stated and correctly evaluated examples. Other candidates made arithmetic slips in their examples or confused themselves with thinking that output which was an odd integer was not a whole number or output that was a negative integer was not a whole number. These candidates may have done better if they had reread the question before making their comments. Better solutions were concise, clear and concentrated on the correct property of the output.
7	(a) (b)	Many candidates seemed secure in their understanding of the different averages and the range. Many candidates found the 4 correct shoe sizes from correct working. Some candidates gave a final answer of 11, 11, 13, 15, not realising that this had a median of 12 not 11. Some candidates found the smallest shoe size to be 9 but were unable to interpret the information regarding the mode and median correctly. Some candidates seemed to think all the rowers had the same shoe size, or perhaps this was confusion with the mean. Other candidates seemed to think there were 13 rowers. This part of the question was very well answered, with candidates being successful in both parts, on the whole. Occasionally, candidates miscounted or mistotalled the number of teams, but this was rare. Also, on occasion, candidates gave a descriptive word rather than a value for the probability in (ii). This was not permitted as, when a probability is asked for, a value is expected.
8	(a)(i) (a)(ii) (b)(i)	This part of the question was usually well answered. Many candidates listed possibilities in some sensible manner. A few candidates thought that salad was a dessert. A few candidates thought that the cost of the lunch was somehow important and attempted to form an answer using that as a basis. In this part, candidates needed to give some indication that the probability of a person choosing a dessert was dependent on that person. Many candidates were able to do this and made comments along the lines of 'They might not like apple pie,' or 'They may be allergic to apple pie,' and so on. Comments such as 'They might not have a dessert,' were not allowed since this was given in Mary's statement. Usually well answered.

	(b)(ii)	A good number of candidates were able to find either 40% of 120 or 60% of 120. Arithmetic skills were generally good in this question with the correct answer often being given. Some candidates attempted 40% or 60% of 120, but did not arrive at the correct value. These candidates often earned the 2 method marks for working with their values. However, candidates who simply worked with 60 and 60 had simplified the working and were not credited. Some candidates only worked out the money made from either the hot or the cold drinks. Other candidates misinterpreted the information given and calculated the money made from selling 120 of each type of drink.
	(c)	Candidates who understood that the profit made per glass was 75p generally earned the method mark. A good number of these also earned the accuracy mark for a correct answer. Some candidates, having shown, for example $75p \times 2 = 150$, $150 \times 10 = 1500$ then gave their answer as 12. Other candidates attempted a build-up method using repeated addition to try to make £15. This varied in success and success was often dependent on how tidy and careful they were. The most common error made was to try to divide 15 by 1.75 and the common wrong answer was, therefore, 9.
9	(a)&(b)	These parts of the question were almost always correctly answered.
	(c)	Candidates should be familiar with reading information from maps and diagrams and the grid given in this part of the question was designed to resemble a map. The most straightforward solution to this problem was to measure the distance from A to D as 10 cm, to use the scale given to find the actual distance as 8 km and then to consider 8km in 20 mins being the same as 24 km in 60 mins. Only the better candidates actually did this. Weaker candidates often used 8 cm instead of 10 cm – this being the vertical component of the displacement between A and D. Those candidates using 8 quite often found the actual distance as 0.64 rather than 6.4. Estimating the answer as being more than half of 8 (since 0.8 is more than 0.5) would have perhaps helped these candidates. Many candidates did not attempt to convert the distance per 20 mins into a distance per 60 minutes – most of them stopped once they had used the scale.
10	(a)	A reasonable proportion of candidates were awarded 2 marks here. Most candidates knew either that 5^2 was 25 or that $\sqrt{49}$ was 7. The most common errors were using $5^2 = 10$ or $\sqrt{49} = 24.5$.
	(b)	Candidates who rounded all 3 values correctly almost always went on to score 2 marks. A small number of candidates thought that 40×100 was 400 and gave their final answer as 40. A check of how reasonable this answer was should have resulted in this error being corrected as candidates should understand that multiplying 40 by 100 and dividing by 10 cannot result in an answer of 40. Some candidates rounded only the values in the numerator and then divided by 11. This resulted in arithmetic that was more challenging than necessary. These candidates did not seem to understand that one of the benefits of estimating an answer is to avoid such arithmetic – particularly when no calculator is permitted. A small number of candidates attempted to calculate the exact answer to the calculation. As this was not the demand of the question, these candidates were not credited.
11	(a)	This part of the question was very well answered, with almost all candidates understanding that the symbol used was inappropriate.
	(b) (i)&(ii)	Correct answers to either part (i) or (ii) were rare. Candidates often made comments about missing grid lines rather than spotting the clear error made in the vertical scale. They then tended to state, as an impact, that the values were not easy to read or that the points were not plotted correctly. Those candidates who did spot the vertical scale was not correct often did not explain that the values were not equally spaced. They often made a comment such as 'They are all doubled except 1 becomes 3.'

12	(a)	Better candidates divided 250 by 4 and then worked with 62 to try to find a pair of values that fitted all the given criteria or listed pairs of roughly equal values, often starting with 50 of each, and checked how much those cost before refining their answers in further trials. Some fully correct answers were seen, although these were not common. A small number of candidates stopped once they had found that 60 pens and 70 cards gave a total cost of £250, without checking whether further refinement were possible. Some candidates would have improved if they had taken a little more care with reading the question or the presentation of their work, as a few candidates confused the costs of the cards and the pens. Some candidates tried to find equal numbers of pens and cards rather than approximately equal numbers of pens and cards. These candidates often gave their answers as 62 and 62. This did not fit the total cost criterion. Other candidates completely misinterpreted what was required and tried to find the number of cards that could be bought with £125 and the number of pens that could be bought with £125 or divided 250 by 3 and by 1.
13	(b)	Candidates were often more successful with this part of the question. A good proportion of candidates earned all 4 marks. Many other candidates earned at least 2 marks – often for the total interest for Fred being £75. An answer of 2 years was not uncommon for the length of time of Ceri's investment. This seemed mostly to stem from calculating 10% of 300 only. These candidates may have improved if they had reread the question before attempting the second calculation. A small number of candidates attempted to find compound, rather than simple interest.
14	(a)	A good number of candidates understood that the formula was not valid when p was 0. The most common reason stated was along the lines that if p was 0 then there was no meat to cook.
15	(b)(i)	Many candidates scored 3 marks for a correct completed table, correct plot and line. Some candidates omitted to draw the line, although most plotted their points. Weaker candidates offered values of t such as 20, 40, 60, 80.
	(b)(ii)	This was not well-answered. Even those candidates who had drawn a line in part (b)(i) did not usually see that this was the simplest means of finding the answer to this part. Some candidates tried to use the formula, with very limited success and some candidates did not attempt this part.
	(c)	Better candidates were able to correctly interpret the information given and provide the correct answer. A few candidates omitted to take account of the 15 minutes the meat needed to 'rest'. Weaker candidates thought that $\frac{3}{4}$ hour was 15 minutes or tried to find $\frac{3}{4}$ of 60 without success. It is expected that candidates will know the quarter hours in minutes at this level. Some answers were very descriptive with little mathematical content.
14	(a)	The majority of candidates selected graph 2. Among those incorrect, the common wrong answer was graph 4.
	(b)(i)	A good proportion of candidates were able to correctly read at least two of the 4 marks required correctly, with many of these giving all 4 marks correctly.
	(b)(ii)	Some candidates were able to determine that 4 of the 9 candidates scored more than 70% in maths. However, as they were required to find the probability, a final answer of, for example, '4 out of 9' was not sufficient – the correct fractional form needed to be given. Some candidates may have benefitted from drawing a line at 70% for maths on the graph to help them visualise the answer. Answers of $\frac{4}{5}$ were commonly seen.
15	(a)	The majority of candidates did not recognise the sequence of numbers as being cube numbers. More familiarity with special sequences such as square, cube, triangular and Fibonacci numbers is expected. Very few candidates were correct and those who were not tended to, fruitlessly, apply the method of differences.

	(b)(i)	Candidates found this part of the question challenging and many made no attempt to answer. A reasonable number of candidates understood how to use the expression for the n th term to generate values. These candidates almost always earned 2 marks. Arithmetic slips were made on occasion.
	(b)(ii)	Many candidates thought that Sasha was incorrect. Some justified this by attempting to evaluate n^2 and $8n^2 - 16$. The argument that she was correct as it would be ' 8×8 ' was also seen on more than one occasion. Only the best candidates were able to make the correct decision and give a successful justification.
16	(a)	Candidates found this question challenging. Very few candidates made any attempt at a solution. Most attempts were unsuccessful. Those candidates who did make some progress often gave the answer $\begin{pmatrix} 9 \\ 6.5 \end{pmatrix}$, with candidates having misread $\mathbf{q}$ as $\begin{pmatrix} 1 \\ 1.5 \end{pmatrix}$ or were able to correctly state the vector $2\mathbf{p}$. If candidates had been able to associate the column vectors given in this way to translation or displacement vectors, they may have made more progress with this question.
	(b)	In this part candidates were expected to draw a line 3 times the length of the line given and with the arrow reversed. Many omitted to reverse the arrow. Most lines were of the wrong length and in completely the wrong direction (often being reflected horizontally). Many candidates could not see what was needed and made no attempt at an answer.
17	(a) (i)/(ii)	In this part of the question, candidates were expected to criticise the questions given, rather than make observations as to whether a person did or did not own a mobile phone. In part (i), the most common correct observations related to the list of options being incomplete. It was also correct to comment that someone might use their phone to do more than one of the things listed. In part (ii), comments about the vagueness of the options given or there being no specific time frame were usually the most successful.
	(b)(i)	A very few candidates observed that the data was likely to be unreliable because it was based upon a very small sample or because the sample comprised of students only. Some candidates incorrectly thought that the fewer the students the more reliable the data. Some candidates made comments about the others statistics given for monthly contracts, not identifying the sample size as being the key. Comments made by other candidates were sometimes too vague to be credited, with no clear decision on reliability being given or were not based on the data in the table. For example, some candidates said the data would be reliable as it would be unlimited every month.
	(b)(ii)	This part of the question was not well answered by most candidates. The best answers were based upon the SIM only bills being less varied and the Pay-as-you-go bills having a smaller average value. Some candidates made comments that were not comparative. Comments about the highest bill being cheaper or the lowest bill being cheaper were not credited as candidates had already been given information about the lowest and highest bills in the question and needed to make further comments on the data. Other candidates made general comments, not based on the data given in the question, such as 'Pay-as-you-go could be better because if you cannot afford it you do not have to buy it.'

18		The simplest solution to this question was to construct a kite with B , A and C as 3 of its vertices. Candidates who tried this were almost always successful. Some candidates did not have a full set of arcs, having drawn arcs intersecting at A only. As this question required a construction, arcs were required for any credit to be given. A small number of candidates drew arcs but then did not make any attempt to draw the perpendicular line. Candidates need to be familiar with the use of the words 'the perpendicular' to represent 'the perpendicular line' in this circumstance. A few candidates attempted to draw the perpendicular bisector of BC , completely ignoring point A .
19	(a)	This question was not well attempted with only the best candidates earning at least 1 mark. Some candidates attempted to add 5 and 2 rather than multiplying -5 and $+2$. Other candidates found 4 correct terms and then went on to combine $+2x$ and $-5x$ as $-7x$ or omitted the x terms altogether. Some candidates offered answers such as $x^2 + 7$ or $x^2 + 10$. Other candidates gave answers in terms of x only such as $x - 3$ or $-5x + 2x$.
	(b)	Again, only the best candidates made progress with this question. A small number of candidates simplified correctly. A few other candidates earned one mark, usually for $9a$. Weaker candidates either did not answer or simplified it as $9a \times 5a$, for example, – incorrectly dealing with the powers. Some candidates attempted to factorise the product given, rather than simplifying it or gave an answer of $9a^3$.
20	(a) (i)/(ii)	Better candidates were able to identify the correct statement in part (i). There was no obvious incorrect choice with many candidates choosing any one of the remaining 3 statements. Candidates found part (ii) challenging. A few candidates correctly substituted 100 into the given equation. Many were unable to correctly solve the equation that resulted and an answer of 4 was seen several times. Many candidates stated the answer was 4 without any working. If they had shown some method they would likely have earned at least one mark here.
	(b)	Candidates writing the relationship $\text{speed} = \frac{\text{distance}}{\text{time}}$ were most successful in this part. Some candidates understood that, for example, 4 metres and 0.8 seconds were relevant but did not combine the values correctly. Answers of 3.2 and 0.2 were common.
21	(a) (i)/(ii)	Part (a) was not well answered. Many candidates misunderstood what was needed. The most common incorrect answer to part (i) was 15. Candidates were not transferring their algebra skills here and algebraic thinking was certainly needed, to be successful. Some candidates used π as 3.14, evaluating $15\pi - \pi$ as 43.96 rather than simplifying it to 14π . In part (ii) the most common incorrect answer was 4π .
	(b)	The question required the use of step by step problem solving skills. The first step in the solution was to find the diameter of the circle as 6 or the radius as 3. Only a few candidates were able to do this. Very few candidates, however, then went on to use πr^2 to find the area of the circle. A correct final answer, in terms of π , was rarely seen. The very few candidates who had found the area correctly usually attempted to write 9π as a decimal using 3.14 or $\frac{22}{7}$.
22	(a)	This was a standard question. A few candidates showed good arithmetic skills and arrived at the correct answer. Occasional arithmetic errors were seen. The most common incorrect answer given was $\frac{4}{2}$.

	(b)	Candidates found this part of the question very challenging, with very few making any real progress. The key to the solution was to find the LCM of 5 and 7 as 35 and then multiply 4 and 11 by 7 and 5 respectively. The most common incorrect solutions offered were based upon $4 + 5 = 9$ and $7 + 11 = 18$ and attempting to multiply 4, 5 and 11 or 4, 7 and 11 by 9 or 18.
	(c)	Candidates found this part of the question to be accessible and a good number gave a fully correct solution. Some candidates would have benefitted from reading the question more carefully as $205 \div 8$ was commonly attempted. A few candidates found the length of the shorter piece of string, rather than finding the total length.
23	(a)	Again, candidates found this question to be very challenging. Those who were most successful gave clear statements in steps rather than trying to attempt a single calculation. Many candidates stated that fewer workers would take less time rather than more time, confusing direct and inverse proportion. Some candidates may have improved their solution if their setting out had been less haphazard and confused. The use of a table to keep track of values is advocated in the solution to this type of question.
	(b)	Some candidates were able to state a sensible assumption that they had needed to make when answering part (a). Many candidates made assumptions based on workers working at the same rate. This was not allowed as this information had been given in part (a). Not all candidates commented on how their answer to part (a) would have changed if their assumption had not been correct. These candidates may have benefited from rereading the question.

MATHEMATICS (NEW)
GCSE (NEW)
November 2017
COMPONENT 1 - HIGHER

To succeed in this examination, candidates needed to show sufficient method so that marks could be awarded even when the final answer was not correct. It was important that method was shown for any solution that required more than one step. Candidates needed to make sure that they read each question carefully and paid careful attention to key words and phrases. It is also always a good idea if candidates reread the question once they have completed their solution to check that they have answered all that is required. Candidates who presented their work neatly were less likely to make errors such as miscopying their own writing.

Candidates were clearly well prepared for some parts of this examination paper, although some candidates seemed unfamiliar with a few topics - for example vectors, functions and completing the square. The use of a calculator was not allowed and candidates showed reasonable arithmetic skills. Candidates performed reasonably well on routine questions but were less able to identify a correct method of solution to problem-solving questions. Some questions involved candidates making some type of comment to either describe an assumption or an error in a solution. Many candidates found this quite challenging. For example, they did not seem to realise that restating information they were given in the question was not a valid assumption.

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 anticipated, the number of entries was low. Some points that have arisen from the candidates' solutions have been included in this report along with comments regarding the most efficient approach in places. For comments on the common questions with Foundation Tier, refer to the Foundation Tier report.

Question		Comments
10	(a)	Candidates were expected to identify step 3 in Olly's solution as being incorrect as the inequality sign should have been reversed and it has not been. Candidates struggled to spot this key issue with inequalities. About half of all candidates thought that Olly's solution was correct and made comments about his step by step approach to find a value for x being sensible. Other candidates thought that Olly's solution was incorrect for an incorrect reason. For example, it was suggested that when he divided by -2 it should have become $+2$.
	(b)	Part (i) was intended as a lead into the solution to part (ii), with candidates being able to 'see' the solution from the graph. This is a really useful approach, although candidates did not seem to realise this. About half of candidates attempted to draw a graph. These all attempted something that resembled a parabola, although some were better in shape than others. All candidates who produced a graph earned at least a mark for the correct roots. Candidates who made any progress with part (ii) tended to ignore the graph and restart with more algebra, with varying success. Only better candidates were able to offer a correct solution to this part.

11	(a)(i)	This part of the question was very well answered, with almost all candidates offering the correct value.
	(a)(ii)	This question was fairly standard. Even so, candidates still found it challenging, with only the better students earning any marks. Candidates who drew lines on their cumulative frequency diagram were often more successful than those who did not. Some candidates needed to take more care with reading the scales on the diagram. It is expected, when working at this level, that candidates will be able to manage this successfully.
	(b)(i)	Most candidates seemed familiar with what was needed. Some candidates did not read the information in the question carefully enough and positioned the end of the right hand whisker at 10.5 instead of 10.4. Candidates should understand that, even though the final plot of the cumulative frequency diagram was at (10.5, 100), that does not mean that the greatest value was actually at 10.5. This did not need to be assumed and, in fact, should not have been assumed as it was clearly stated in the question.
	(b)(ii)	All candidates chose the correct tablet computer in this part. Many good and clear reasons for their choice were stated. However, the reason stated was not always sufficient for the mark to be awarded. For example, some candidates stated that Neena should buy Litestar A because it has the better maximum battery life. This could not be given any credit unless it was supported by earlier work – such as a box plot for Litestar A with the right hand whisker ending at 10.5.
18	(a)	To answer this part of the question successfully, candidates needed to interpret the given gradient of OA and then consider the given length of OA . One way to do this would have been to draw both a 3, 4, 5 triangle and a 6, 8, 10 triangle. Commenting on the similarity of these triangles would have completed the argument. Whilst the 6, 8, 10 triangle was seen, the 3, 4, 5 triangle was omitted and no comment about similarity was stated.
	(b)	There were many ways to answer this part. Many are listed in the mark scheme. However, most candidates made no attempt at a solution. Those that did tended to assume that triangle OAB was an isosceles triangle with $OA = OB$ and gave the coordinates of B as (12, 0).
20		This question assessed students understanding of the product rule for counting. Again, some students did not seem to be familiar with this part of the syllabus.
	(a) (i)&(ii)	Only better candidates were able to make any progress with this question. In part (i), some candidates simply attempted to multiply the given numbers together. Other candidates attempted to list some of the 5-digit numbers. This approach is of little value and should be discouraged for problems such as this where the number of possibilities is far too great to list. Many candidates made no attempt to answer part (ii). Those that did omitted to notice that only 2 of the 5 digits given were odd. Consequently the answer 50% was offered.
	(b)	Only half of all candidates made any attempt to answer this question. Those candidates who did attempt it found it very challenging. Candidates, again, attempted to list numbers or simply evaluated $7!$.

MATHEMATICS NEW

GCSE (NEW)

November 2017

COMPONENT 2 - FOUNDATION

The November series is a resit opportunity only, so as anticipated the number of entries compared with the summer series was lower. The range of marks compared with the summer 2017 series was smaller, with both extremes missing.

Question	Part	Commentary
1		Question 1 gave most candidates a successful easing into the paper. The vast majority of candidates were able to score either full marks or close to full marks.
	a	Candidates managed this question well – interpreting data from a table.
	b	Most candidates were able to calculate the cost of the weekly rate compared with the cost for 7 nights. Only occasional slips were seen, where candidates selected incorrect amounts from the table.
	c(i)	Again, most candidates were successful in calculating the difference in cost. Some candidates, however, recorded their difference in part c(ii), as part of their explanation.
	c(ii)	Most candidates successfully explained that a week is cheaper than 6 nights.
2	a	Substituting into a formula, candidates were able to find the correct answer in most cases.
	b(i)	For this question, this was the part that caused candidates the biggest problem. Many candidates managed to work with multiples of £7.50, but did not successfully demonstrate the answers either side of 100 to show that it was impossible to be paid exactly £100 using this formula.
	b(ii)	More candidates were successful here – even when they failed to use the two answers either side of £100 in part b(i), they were able to find 9 hours successfully. The common incorrect answer of 13 hours was seen many times from candidates who forgot to remove the £30 before dividing by £7.50.
3		Candidates scored the full range of 0, 1, 2, or 3 marks in this question. There is a need to remember the definitions of prime numbers, and not to confuse multiples with factors and vice versa.
4	a	Most candidates managed to give 3 odd and 3 even numbers correctly, even though the question was disguised in a context of a card game.
	b	Most candidates managed to explain that they need to replace odd cards with even card(s). Occasionally, they were caught out and switched even for odd.
5		Whilst there were a lot of correct plan views identified, a significant number of responses were given for the front elevation instead of for the plan as the question asked.

6	a	This was clearly a calculator question, and many managed to get either the correctly rounded answer of 3.21, or the incorrectly rounded answer of 3.20. There were also a number of completely incorrect responses of 12.00. When candidates are asked to round, they should be encouraged to write the original answer from their calculator, then give the rounded answer. This would allow some to get a mark for rounding even if their calculation was incorrect.
	b	Many candidates need to learn place values of decimal numbers, and also recognise them in fraction form, as many did not recognise $\frac{5}{100}$ as the correct answer even though this was a multiple-choice style question.
7		This was another example of a question testing definitions. Many candidates did not know the differences between expressions, equations, inequalities and formulas.
8	a	This question was intended to test candidates on their understanding of numerator, denominator, even number and product. The word 'product' caught out most candidates who did not get full marks.
	b	Many candidates who gave a fraction in (a) were able to convert this into a percentage in part (b).
9	a	Many candidates correctly calculated the mass of one apple using the information provided on the scales. Although it was condoned, a few candidates used incorrect units (kg) instead of grams.
	b	Correct answers were again seen in many cases for this basic 'equation in context' question. Where candidates were not totally successful in calculating the total mass of two of each fruit, they often managed to score the first M1 mark for correctly calculating the mass of one pear. This is a good example of a question on a calculator paper where candidates would be advised to show some workings to score method marks in case errors are made in calculations.
10	a	Most candidates were able to simplify the given expression. Many of them gave the a and b in reversed order, though this is perfectly acceptable.
	b	Expanding a single term over a bracket is generally well done, with occasional slips by candidates who 'forget' that the second term must also be multiplied.
	c	Explaining why $c^2 + 4c$ cannot be simplified provided a mixed response by candidates. It was sufficient to state that c^2 and $4c$ are not the same and therefore cannot be added.
	d(i)	Candidates did not answer these two parts as well as earlier parts of question 10. For this part they simply needed to write in a basic algebraic form that Ben's age is half of Fabian's. For this, the ideal answer would be $\frac{f}{2}$, though $f \div 2$ and $0.5f$ were accepted.
	d(ii)	This part was a follow-through from the previous part. Many candidates misinterpreted 'in five years' time' as a multiplication by 5 rather than an addition of 5 years.
11	a	Most candidates demonstrated rather than explained that 20 cars paying £3 for staying over 4 hours made the total of £60 as requested.
	b	There were a number of responses here that totalled £60, some of them far more inventive than they needed to be!

12		This question was not well answered for what was really not a difficult compound area question, requiring the subtraction of three rectangles from a larger rectangle. There were many candidates who made the mistake of using the perimeter instead of the area of a rectangle. Some candidates who managed to calculate two or three areas correctly, gained M1, and were also able to pick up the B1 mark for giving a correct number of tins of paint for their area.
13	a(i)	Candidates need to be able to explain that congruent means 'exactly the same' (i.e. same shape and size) rather than merely 'same shape'.
	a(ii)	Translating using the given translation vector caused lots of issues, with candidates either not attempting the part question, or translating in the wrong direction(s).
	b(i)	Most candidates were able to describe the given triangle as 'right-angled' or 'scalene'.
	b(ii)	Enlargement by scale factor 3 was answered well by some, but not by all. Whilst most managed to multiply the dimensions of the shape by 3 in at least one direction, some then did not do the same for the second length, usually the base side.
14	a	Adding the opening times up, or at least showing a method that gained a mark for a good attempt at adding gained many candidates marks for this part of question 14, even when they were unable to do any more of the question.
	b(i)	The first step of this part, calculating the increased number of hours was missed by many, so they were left unable to get much further in this part. Some candidates then attempted to write some times that totalled 'their 82.5 hours' but then forgot to include the Sunday opening times given in the answer box. There were many inventive responses of times totalling 82.5, with occasional slips. Some candidates need to look at their answers to see if they appear reasonable. If the opening times of a shop are complicated, they are likely to be incorrect.
	b(ii)	The first part of this section of the question was the hardest question so far for most candidates, with the majority not scoring many, if any, marks. The assumption was marginally better answered than the preceding part, or than the impact statement following. It would have been sufficient to write 'I assumed that all workers did all of the extra hours', followed by 'the total weekly pay would be less because not all workers did the extra hours'.
15	a(i)	Many candidates managed to score both marks here for $\frac{120}{360}$ (or $\frac{1}{3}$), or 1 mark for calculating '120' correctly.
	a(ii)	Candidates were less able to calculate that $\frac{120}{360}$ of the 1200 total is 400.
	b(i)	Responses to the drawing a bar chart question were disappointing. Many candidates did not manage to calculate the frequencies correctly and then used the angles from the pie chart as the frequencies. They were able to score B1 or B2 from this if they managed to give an acceptable uniform scale, with labels.
	b(ii)	Many candidates did not make it clear whether their advantage or disadvantage was for the bar chart or for the pie chart.
16	a(i)	Few candidates were able to pick the 245 and the 350 from this worded question, convert into a ratio and simplify to their lowest terms.
	a(ii)	Because this question was set in a context rather than simply asking candidates to divide £6970 in the ratio 7:10, they found it more difficult.

	b	Some candidates managed to get to a half way point with this combined ratio/fraction problem. An answer of $\frac{4.5}{16}$ was seen about as many times as the correct answer of $\frac{9}{32}$. Candidates should be encouraged to leave a fraction answer without decimal numbers within it.
17		In a best value question, candidates are expected to find either the cost per gram (or other unit) or the grams per £. Some managed to do this and get all three marks. Occasionally candidates misinterpreted the costs per £ and selected the incorrect bottle. Too many candidates attempted to look at the differences in grams and the differences in cost which did not earn them marks as they did not show clearly which bottle was the better value.
18	a	Most candidates were able to select the correct point that completes the square. These points did not need to be joined to show the square.
	b(i)	There were many correct responses stating order of rotation of a rectangle being 2. Some made the common mistake of giving the order as 4.
	b(ii)	Adding more squares to increase the order of rotational symmetry proved to be a difficult task for many.
19	a	Many candidates need to remember the complete formula for calculating the area of a triangle. Many forgot that the base x height needs to be halved.
	b	When calculating volume, candidates should clearly show that they are multiplying the area (from (a)) by the length of the shape. Candidates who started again and incorrectly calculated the volume were not credited. Those who clearly used their area (usually 44) and multiplied by 4.5 were awarded the mark.
	c	The intention of this explain question was to test knowledge of conversion between mm and cm, so knowing that 50mm is longer than 4.5cm was sufficient.
20	a	Candidates needed to point out that the first line is incorrect – 8% is 0.08 not 0.8 or equivalent. Finding the error in a calculation is something that needs working on in many cases.
	b	More candidates were able to find the correct answer in part (b) despite not always explaining the error correctly in (a).
	c	Many found giving the single multiplier to answer the question a step too far.
21	a	Many found converting the recipe for additional people relatively straightforward.
	b	There were a pleasing number of correct responses for this problem solving question when they had to find the number of servings that could be made with the given ingredient.
22		Candidates did not recognise the right angled triangle as a Pythagoras question. If recognised, candidates then went on to successfully explain that as the hypotenuse would not be 14m, the triangle could not be a right angled triangle.
23		This question is the first of the Higher/Foundation common questions. Whilst many did manage to calculate the smallest share correctly, many misread what they needed to do, dividing the £330 by 20 and multiplying by 2. Others started well, and divided £330 by 15, but then forgot to multiply the result by 2.
24	a	Most managed to select and add the number 1 from each spinner to get the correct answer of 2.

	b	Some were confused in this part by the inequality, as they knew $4+5$ gave them 9, but as this was the total and the total couldn't be more than 9, they didn't know what to put – yes or no.
	c	Whilst some did manage to comment that $4+1$ and $3+2$ were missing, most were not able to complete the rest of the question.
25		This question really caused issues for the majority of candidates. If they attempted the question at all, they tried to use simple interest rather than compound interest.
26	a	This was a standard calculation of the mean from a grouped data table. This method was misunderstood by many, as they did not find midpoint, or multiply to find the total. Some, who did manage to find the total then divided by 4 instead of by the total frequency (30). A small number of candidates attempted to do all the work on their calculator and wrote nothing down except the answer. If this was correct, they got away with it. However, more than one candidate reached an answer of 5.9 with no workings, (probably copied out from part (b)). Whilst the correct answer is 6, and scores 4 marks, 5.9 with no workings is not correct and can gain no marks.
	b	Very few managed to explain that the estimated mean uses midpoints whereas using the actual figures could result in the same value for the two towns.
27	a	This was a standard question to solve an equation with the unknown on both sides. It should have had more correct responses; candidates who attempted to show clear working from the outset usually managed to score all three marks, otherwise if a slip was made it was still possible to score 1 or two marks for correct workings seen.
	b	A full range of answers seen for this factorisation into a single bracket. Some responses were 'correct' but only partially factorised (taking out the 5, or taking out the x), others managed to fully factorise.
28		Foundation candidates attempting this question were generally unable to score any marks at all.
29	a	This was a multiple choice question, so it was surprising that a number of candidates had left this blank. In general candidates need to be able to recognise that the x -coefficient is the gradient, and if these are the same, the lines are parallel.
	b	For a question asking for the equation of a straight line, this was relatively straightforward, as the gradient and the y -intercept were given.

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- Showing working is important, for example in question 3. Showing the midpoints, even at the side of the table enables follow through from errors provided the candidates uses values from within the groups.
- It is important that candidates know standard conversions of measure, for example in question 8. Knowledge that $1 \text{ km} = 1000 \text{ m}$ is required.
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MATHEMATICS (NEW)

GCSE (NEW)

November 2017

COMPONENT 2 HIGHER

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