GCSE EXAMINERS' REPORTS

MATHEMATICS – NUMERACY (NEW)

NOVEMBER 2017

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MATHEMATICS NUMERACY – (NEW)

GCSE

November 2017

UNIT 1 – FOUNDATION

There was no evidence to suggest that the examination paper was too long for candidates, as there were responses in later questions.

The paper differentiated well, with different styles of questions and a graduation in the level of difficulty.

As 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.

Candidates need to focus on:

- Knowing that the word difference means to subtract
- Reading scales correctly
- Completing constructions using a pair of compasses
- Recognising angle facts within parallel lines

Question	Comments
1	In part (a), the most common incorrect answer was (8, 1); candidates swapped the coordinates. Some candidates used incorrect notation such as 1 – 8. In (b), many candidates plotted their point at (7, 6).Some actually circled number 7 and number 6 on the map. Many candidates were able to give at least one correct direction in part (c) but several gave the opposite directions. Some gave directions turning right from the Saw Mill. Some just gave the circled numbers on the map that were along the route from the Saw Mill to the Newbridge War Memorial instead of left and right directions.
2	In part (a), a few candidates gave the month of February as 2 or 2nd. Many candidates did not understand that they needed to subtract 47 from 314 in part (b). Part (c) was about understanding the coding of the employee's number. Many candidates achieved 1 mark but lost the 2nd mark often for leaving out the initial zero or using a / instead of a – within the code. Candidates did not look closely at the nets given in part (d). Many were able to identify the first net as an appropriate one but most gave the 4th net as their second answer not realising that the sides were not of a suitable length to create the net.

3	Most candidates engaged with (a)(i) and many were able to give the correct 3 dates. Some gave the 15th, 16th and 17th instead of 16th, 17th and 18th and some only gave the days of the week rather than the dates. In part (a)(ii), most candidates gained the mark for the charge for the plumber. The most common errors were: • the number of hours per day for the carpenter given as 9 hours i.e. the hour for lunch was not taken into account; • many thought that the electrician charge was £575 per day rather than £575 for the 3 days. Many candidates were able to use some labels in their work and show their calculations. However, not all calculations were labelled, operations were not written for each calculation when using column methods for addition and multiplication, and units were not always given. Some candidates used the = sign inappropriately. In (b), many candidates only gave the length as 11cm (± 2mm) and did not engage with the scale. When they did engage with the scale, some did not give their final answer in metres. Some candidates did not understand what was meant as the length of the van. A few measured each edge of the van.
4	Part (a) was well answered. In (b), many candidates were able to explain why Sophia was incorrect. In part (c), very few candidates were able to gain both marks. Many thought the correct answer was 10 links. Very few candidates drew a diagram to help themselves and many did not continue the sequence.
5	The most common incorrect answer in (a) was -22. Candidates read the scale incorrectly. In (b), candidates did not interpret the question correctly and did not identify where the mesosphere was. Many gave an answer of 95˚C rather than -95˚C. In part (c), many candidates did not understand the meaning of the word difference in a mathematical context. Very few could read the scale correctly.
6	Many candidates obtained one mark for calculating the perimeter of the square or for putting the correct measurements on the length and width of the rectangle. Very few candidates were able to show all their workings for the perimeter of both shapes and then calculate the difference in the perimeter to find how much more ribbon was needed.
7	This question was well answered by Foundation tier candidates, with many calculating the cost of lemons correctly for at least 2 of the supermarkets. A fairly common error for Edges Mart and Food Uno was to find the cost of 1 lemon and then multiply by 6 to give the cost of 6 lemons. A common incorrect answer for Cost4go was 80p as some thought that they were only buying 3 so should only find the cost of 2 lemons. Some candidates did not connect with the idea that Aled needed 6 lemons and that he did not necessarily have to buy 6 lemons. A few candidates wrote their answers with incorrect units e.g. wrote £1.52 as 1.52p.

8	In part (a), some candidates did select 35 as their correct response but many thought that there were 34 or 36 posts. In part (b), most candidates did not fully engage with the question. Many did not engage with the widths of the 5 posts needing to be deducted from the 8.5m and completely omitted the fence posts. Those that did, incorrectly miscalculated 5 × 10 cm, with a common error being 2.5 m. Some candidates did not consider that 4 panels were needed for the 5 posts. Several candidates only calculated the cost of 5 posts which did not gain any marks. In part (c), most candidates did not consider the area of the faces. A common incorrect response was 12p.
9	Very few candidates were able to gain any marks in this question. If any marks were awarded, it was for knowing that '$c = d$'. A common incorrect answer for 'a' was 67°. It appeared that most candidates do not understand the facts of angles created within parallel lines.
10	In part (a), the points most often plotted incorrectly were (152, 72), (174, 86) and (178, 90). Many candidates did not read or interpret the scales correctly. A number of candidates incorrectly joined plotted points. Many candidates selected 'yes' in part (b); some candidates did not give an appropriate reason or give any reason. Some only gave the point (178, 90) from the table without any further response. Some candidates answered this part well and were able to discuss positive correlation in their answer. The most common incorrect answers in part (c) were answers based on 'get more data' or 'the measurements are not accurate'. Most candidates did not interpret the question correctly. Most thought that they needed to give an improvement rather than explain why the given scatter graph was not reliable.
11	There were many correct responses in part (a); errors were usually due to errors in multiplication or from considering 5 days for both the cement mixer and jet washer or 7 days for both. Some candidates calculated the cost for each but did not find the total cost. In part (b), most candidates attempted a trial and improvement method. Very few attempted an algebraic method. An unsupported answer of 3 days was not credited with all 3 marks, as working was a requirement for this question.
12	Most candidates did not show a technique for bisecting an angle using a pair of compasses. Most candidates only drew a line from Ty Gwyn. This was often not 9 cm in length.

MATHEMATICS NUMERACY – (NEW)

GCSE

November 2017

UNIT 1 – INTERMEDIATE

The paper differentiated well, 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.

Candidates need to be aware of the following points:

Question	Comments
1	In part (a), although there was evidence of 9.8 – 4.3 = 5.5, some candidates had misunderstanding regarding the place value when considering this as £5.5 million. However, many candidates did select the correct answer. For part (b) knowledge of 1 mile ≈ 1.6 km (or 8 km ≈ 5 miles) was required. Unfortunately many candidates did not know this conversion. Many candidates multiplied 15 by 100 to give 1500 km as their answer while others gave 15000 km. In part (c) many candidates did calculate 30 × 148 correctly, errors occurred more in the conversion from centimetres to metres than in the calculation. Only a few candidates incorrectly decided to divide 148 by 30.
2	In general part (a) was well answered, with many candidates calculating the cost of lemons correctly for at least 2 of the supermarkets. A fairly common error for Edges Mart and Food Uno was to find the cost of 1 lemon and then multiply by 6 to give the cost of 6 lemons. The candidates were generally clear with organisation, communication. The writing aspect, although generally good, was sometimes marred by inappropriate use of equal signs. Many candidates did correctly select Food Uno in part (b), although unfortunately some candidates did not give a reason for their answer, so were not awarded a mark.

3	In part (a), although many candidates did select 35 as their correct response, other answers were often selected as well. In part (b), many candidates did not fully engage with this question. Some candidates considered the width of 5 posts, but some incorrectly miscalculated 5 × 10 cm, with a common error being 2.5 m. Some candidates completely omitted the fence posts. With 5 fence posts, it was important to consider buying 4 panels, this criteria was sometimes missed, even though (a) and the diagram was led the candidates into this. In part (c), many candidates did not start by considering the area of the faces. A common incorrect response was 12p.
4	If any marks were awarded for this question, it was for recognising that '$c = d$'. However, some candidates answer for 'a' was also correct. Few candidates answered all parts correctly.
5	In part (a) the points most often plotted incorrectly were (152, 72) and (178,90). A number of candidates incorrectly decided to join plotted points. Many candidates selected 'yes' in part (b); some candidates did not give an appropriate reason, although in general this part was well answered. There were some clear responses in part (c), however some candidates had perhaps remembered an answer 'get more data', which did not answer the question asked.
6	There were many correct responses in part (a); errors were usually due to errors in multiplication. In part (b), the majority of candidates attempted a trial and improvement method rather than an algebraic method. An unsupported answer of 3 days was not credited with all 3 marks, as working was a requirement for this question.
7	Many candidates did show a technique for bisecting an angle using a pair of compasses. However, some of these candidates did not consider the length of the gas pipe to Cae Nia. Other candidates drew an arc of radius 9 cm, but did not indicate the possible placement of Cae Nia.

8	Part (a)(i) was very well answered, with (ii) being fairly well answered. In part (b)(i) many candidates did not consider the time elapsed from January 2011 to January 2016, consequently giving an incorrect response of 1600 miles. Others thought there were 4 years between 2011 and 2016 and evaluated 200/4 = 50 to give an answer of 1500 miles. There were also many correct responses. There were some clear responses in (b)(ii), showing understanding of unlikeness of the building routes at a constant rate.
9	Part (a) was fairly well answered, with reference to fixed costs. However, there were many incorrect responses stating such as 'there were still some dogs even when it says no dogs'. In part (b) the mark scheme required a correct interpretation of the graph. So it is important that candidates use clear points of reference, using a very small right-angled triangle does not necessarily lead to a correct response. The graph was clear, so accuracy was required. A common incorrect answer was £5 from 50 divided by 10. In part (c)(i) many candidates plotted 20 dogs, £130, but did not draw a parallel line. Some lines with positive gradients were seen, but not always passing through 20 dogs, £130. Part (c)(ii) could also be answered by calculation.
10	Candidates either know or they do not know how to find the median and calculate the interquartile range. The median was much better answered than the interquartile range in part(a)(i). In part (a)(ii), the response required was to realise that the graph could only give an estimate as data had been grouped and that raw data can be used to give an accurate median. In part (b) although many candidates read 34 and 12 from the graph, only a few candidates actually decided to subtract these numbers to find the difference. Of the candidates who did attempt to find the difference, some made errors in calculating 34 – 12. Although candidates had not necessarily answered other parts correctly, many candidates did engage with this part of the question. There were many correct calculations to find 80% of 120 customers.

11	This question was not well answered. The printed previous bill should have given candidates a steer in attempting to calculate the next bill. The first error was not considering the units correctly. However, where a subtraction of units was considered marking followed through reasonable attempts. Many candidates had a technique to calculate 5%, but sometimes this was flawed, starting with the amount then dividing by 10, but then dividing by 10 again rather than halving. Candidates should know how to work with standard utility bills.
12	Part (a)(i) was well answered, (a)(ii) fairly well answered, but (iii) less so. Many candidates do not seem to have knowledge to help them calculate the interquartile range from a box-and-whisker diagram. Part (b) was not well answered, demonstrating that many candidates do not understand how to interpret a box-and-whisker diagram. The required responses need to isolate the data used to support the choice of apple. The only accepted answers were the Gala apple due to the highest upper quartile of the three varieties of apple, or the Pink Lady due to the highest median of the three varieties of apple.
13	Many candidates did not engage with proportion of similar photographs. Common incorrect answers included 15 – 6 = 9cm, so 9 + 4 = 13cm. This incorrect answer occurred frequently.

MATHEMATICS NUMERACY – (NEW)

GCSE

November 2017

UNIT 1 – HIGHER

Candidates appeared to have had sufficient time to attempt all the questions, and the paper differentiated well. The majority of candidates performed well on questions at the lower end of the paper. This report will focus on common errors and misconceptions to aid the interpretation of the item level data available to all centres.

Candidates need to be aware of the following points:

- In questions where a reason for an answer is required, giving multiple reasons could lead to the loss of a mark, as some of the reasons given could be incorrect.
- Being proficient in performing calculations with fractions can be easier than using their decimal equivalents.
- How to perform reverse percentage calculations.

Q1

Part (a)(i) was answered very well, with few incorrect responses. In (a)(ii), less success was seen, with most candidates gaining 1 or 2 of the 3 marks available. The 1st and 4th statements caused the most difficulty.

Part (b)(i) was answered well. Marks were lost by those who just added on another 200 miles, some who thought there were 4 years between 2011 and 2016 leading to an incorrect answer, and others who calculated an increase of 80 miles but didn't add this on to the 1400 miles from 2016. Part (b)(ii) was again answered well, with most explaining that they thought the increase in the number of miles wouldn't be constant each year. Some of the incorrect responses seen were e.g. 'less space to build them', 'weather may affect it'.

Q2

In part (a), many correct explanations were seen e.g. running costs, bills to pay. Examples of incorrect responses were e.g. 'people still have to pay £10', 'William still charges £10 even without dogs'.

In part (b), only correct interpretation of the graph was given credit. An incorrect answer of £5 a day was seen a lot, from 50/10 or by those who estimated the increase in cost for 1 dog from the graph.

In (c)(i), some gained a mark by drawing a straight line through (20, 130) with a positive gradient. Many fully correct lines were seen also. Part (c)(ii) was well answered, with most being able to read off the graph correctly. Some arrived at the answer of £170 by calculation also.

Q3

In (a)(i), most gave a correct median, but there was slightly less success with the interquartile range. This was mainly due to reading the horizontal scale incorrectly.
Part (a)(ii) was not answered that well, with not many candidates commenting about less accuracy with the graph.

Part (b) was also answered well on the whole, although it was disappointing to see some candidates who calculated 34 – 12 incorrectly.

Many correct responses were also seen in (c) which relied on the correct use of percentages of amounts.

Q4
Most candidates answered (a) correctly.

Part (b) was generally well answered with most candidates gaining the majority of marks. Some added another 5% on to 21p which meant their cost of electricity calculation was incorrect. Some also did not subtract the previous meter reading from the current reading, or used the number of units used from the previous bill. Another error seen was adding 20p each month to the standing charge, leading to charges of £7.80, £8 and £8.20 for the 3 months. Most were able to do the budget calculation correctly and give an appropriate conclusion.
This was the OCW question for this paper. This helped candidates to label their calculations, give suitable units and give an appropriate conclusion. Many candidates even with incorrect maths were able to gain 2 OCW marks because of this.

Q5
Part (a)(i) was well answered. Less success was seen in (a)(ii), and slightly less again in (a)(iii). It was evident that a number of candidates did not know how to find the interquartile range from the diagram. Some credit was given to those who chose the wrong tree but gave the correct interquartile range for that tree.

Part (b) was not so well answered. Correct responses focussed on Pink Lady, stating 'highest median' as being the reason.

Q6
Many candidates arrived at 75/90, from changing 0.83 recurring into a fraction, but a number of these only gave an equivalent fraction of 25/30 when they tried to divide it by 3. They then simplified their answer to 5/6. An initial fraction of 83/99 was a common error, and some thought that the decimal they were dealing with was 0.83838383....

Q7
Most candidates drew the correct sized bar in part (a).

A little less success was seen in (b), with 50 being the most popular incorrect response.

Many fully correct answers of 90 were seen in (c). Most candidates gained at least 1 mark, but mistakes were seen in some of the calculations for the areas of the bars.

In part (d), some good responses were seen with candidates using all 3 methods, although estimating the median time was the least popular. Part (d) on the whole was not answered well though. Many calculated that the 45^{th} person would have the median time, but most did not go on to do suitable calculations for the 15 to 25 second group, where the median and Gareth's time were located.

Q8
As in previous series, the topic of similar areas was not answered well in part (a). Those who understood the need to work with an area factor of 1.5^2 tended to go on to gain full marks. Most calculated the scale factor of 1.5, and multiplied £1.60 by this to arrive at an answer of £2.40.

In part (b), very few candidates knew how to calculate reverse percentages. Those who did generally went on to gain full marks. Typically, candidates calculated 20% or 25% of £12 and subtracted the answer from £12, and treated the 2nd step of the calculation in a similar way.

Q9
In part (a), a significant number of candidates knew that the acceleration was zero at the turning point of the graph.

The trapezium rule question in (b) was answered better compared to previous series, with most candidates showing 5 trapezium calculations.
Both parts of (c) were not so well answered. Many did not realise that all they had to do in (c)(i) was to use a simple area calculation for the distance travelled by Delyth, and then subtract this from the distance travelled by Catrin. In (c)(ii), we were looking for an explanation e.g. 'Using the trapezium rule for Catrin cut off bits of the area under the curve'.

Q10
In part (a), there were many correct responses, although a number calculated the scale factor of 14÷8 incorrectly.

In part (b), not many candidates showed a correct method to get to the radius of the cone. As in (a), if candidates had worked with fractions rather than decimals, their calculations could have proved easier. Most used the correct formula for the volume of a cone, but many used 14 as their radius, or had shown an incorrect method for calculating the radius. No credit was given if this was the case.

Q11
In part (a), many candidates gave a correct formula for the area of the sector, and substituted in values correctly. However, they were less successful in rearranging it to make r^2 the subject.

In (b), many candidates gave a correct expression for the area of the square, but were less successful in expanding the brackets, with incorrect terms given for the multiplication of the surds.

MATHEMATICS NUMERACY – (NEW)

GCSE

November 2017

UNIT 2 – FOUNDATION

The paper offered plenty of scope for all Foundation candidates to access marks, even in the questions common with the Intermediate Tier. It tested candidate's ability to apply basic mathematical skills in real world contexts with the aid of a calculator.

As 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 whether each question was well answered or not.

Candidates need to be aware of the following points:

Question	Comments
General	• Some candidates use non calculator methods in this examination. This often resulted in needless errors. • Many candidates display poor organisation and communication skills, particularly in the question that awards two marks for OCW. • Comprehension skills were lacking amongst some candidates who struggled to identify the mathematics necessary for the task.
1a	Although calculators were allowed, errors in the addition of costs were often seen if non-calculator methods were used. Most candidates could identify the relevant costs needed for the total cost of the holiday. Some missed one or more of the costs due to poor organisation or comprehension skills. The question specified the need for quality organisation communication and accuracy in writing but many responses included random lists of figures without structure or explanation of the steps in the argument. Answers were often illogical and lacking in conclusions. Workings were generally shown but sub totals were sometimes seen without reference to how they were obtained. Pound signs were usually included and were essential in the conclusion of the final cost of the holiday. The 10% discount was often ignored or the discount calculated and offered as the final cost of the holiday.
1b	Most candidates engaged in finding the time of the flight. Number lines and flow charts were often seen as a method of counting hours. Credit was given to candidates who managed to establish that there was a 7 hour time gap. The complete answer required an adjustment of 2 hours due to the time zone difference. The adjustment was not always made in the right direction.
1c	A very easy mark could be obtained by criticising the lack of scale or temperatures on the graph. This was well answered; however some described the changes in temperature shown in the graph and lacked basic reading and comprehension skills.
1di	A well answered multiple choice question
1dii	A very badly answered multiple choice question. Candidates did not understand the use of units in mm or cm. 66mm was the closest rainfall to 7cm but the most common wrong answer was 7mm.

1e	(i) This was well answered. (ii) This required readings from two graphs and a subtraction of the two readings. Credit of one mark was given if the correct readings were obtained.
1f	(i)There was generally a good response to finding the median. Most understood the need to order the data. Few could find the middle number as there was an even number of data values in the list. (ii) Few candidates understood that the mode did not represent the data as it was the coldest temperature recorded.
2	Part (a) was well answered, with candidates demonstrating an understanding of using a formula in words. Part (b), involving the use of the formula in reverse, was less successful. Full credit was given for embedded answers even though it was not clear that the candidate had understood the use of division as the reverse of multiplication. Candidates found part (c) less accessible. There was a need to select the mathematics appropriate to the task. This was an obstacle for many. Where candidates understood the need to calculate the area of the rabbit hutch, they often confused the procedure with finding the perimeter, obtaining figures that did not make sense in the context of the problem. Some understood the need to recall figures from earlier parts of the question but, in general this was not well answered.
3	Part (a) was well answered. Part (b) required an understanding that 1kg is approximately 2.2 pounds. Very few candidates knew this fact. Some gained credit for stating that 1kg is more than 2 pounds but this reason was seldom seen. Part (c) was a profit calculation. There was confusion over pounds and pence and these units were sometimes mixed. Candidates with poor reading and comprehension skills struggled in this question.
4	Common with Intermediate Question 1. Part (a). Few obtained the mass by division. Candidates struggled with manipulating decimals even with a calculator. Incorrect values from part (a) were followed through into part (b) to allow credit to be gained for a correct method. This allowed candidates to score part or all of the marks available in part (b).
5	Common with Intermediate Question 2(a) (b) (c) (e). Parts (a),(b) and (c) were multiple choice questions that were generally well answered. In part (d) Spanish and Mandarin was the most common incorrect answer. This was either guess work or a total for each language was given. The point that the largest overlap or intersection of two subjects had to be chosen, was missed by most.
6	Common with Intermediate Question 3. (a) This was very well answered although some gave an answer to the questionnaire rather than giving option boxes for responses. Interpretation of the pie chart was disappointing in (bi) and (bii). Blue was the most common incorrect answer. Some candidates obtained 60, either from measurement or guesswork. Credit was given for this even if ‘the fraction who chose blue’ was ignored.

7	Common with Intermediate Question 4. Part (a) was often incorrectly answered, with 3.12 hours by far being the most common incorrect response. Many candidates engaged in a speed calculation involving total distance ÷ total time but were less successful at expressing 3 hours 30minutes as a decimal with division by 3.3 being offered as a common error.
8	Common with Intermediate Question 5. All four parts of the question required candidates to select the appropriate figures to use in percentage calculations. It was encouraging to see correct calculator methods applied to finding 12% of 3063000 in part (a) and 30% of 3092000 in part (c). Non calculator methods of partitioning were also seen with varying degrees of success. Many candidates could work out the number of men in the population in part (b) but few were able to express this as a percentage of the population. Most struggled with part (d) as some information needed to be taken from the stem of the question. Many struggled with the interpretation of the question, confusing men and women and being unable to select the correct percentage or the correct amount.

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UNIT 2 – INTERMEDIATE

The paper differentiated well, with different styles of questions and a graduation in the level of difficulty.

As 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 whether each question was well answered or not.

Candidates need to be aware of the following points:

Question	Comments
1	Part (a) was fairly well answered, with attempts to calculate 4.50 ÷ 3.60, although the answer 1.25kg was sometimes misinterpreted as 1kg 25g. Other candidates used a different method, such as £3.60 ÷ 4 = 90p, so 90p for ¼kg, with £3.60 + 90p = £4.50 leading to 1¼kg. Although calculators were allowed, there were many errors in simple calculations, such as the change from £20 (perhaps the calculator was not used). Candidates either seemed to realise the processing required, or they were not able to calculate the cost of the pears. Other candidates did not take the given cost of the raspberries (£4.50) into consideration. This part of the question was marked for organisation, communication and writing. Most candidates showed working, although these workings were not always labelled.
2	Parts (a), (b) and (c) were fairly well answered. In part (d) many candidates did not show all their working. This meant that all marks available were not awarded. The first mark was for correct totals for Mandarin, French and German; then a mark for 51 pupils and a mark for Spanish. So those candidates not supporting their answer were only awarded B1 for the choice of Spanish. Candidates found part (e) less accessible than other parts of the question. The strategy to calculate the number of pupils choosing two languages in different combinations was not always seen, and when seen calculations were sometimes incorrectly evaluated. A considerable number of candidates based their answers on the values obtained in part (d) when selecting the most popular language and gave Spanish and Mandarin as their answer.

3	Part (a) was generally well answered, with candidates either showing the possible, not overlapping, boxes or describing clearly what they could be. Unfortunately a number of candidates did not focus on questions 1 and 2, instead they looked at questions 2 and 3. Black was often selected as the correct response, but blue was a fairly common incorrect response in part (b)(i). Part (b)(ii) was fairly well answered, with 60/360 simplified to 1/6. The appropriate sight of 60 demonstrated that the angle of 60° had been checked. Some expressed their answer as a percentage using 60/360 x 100.
4	Part (a) was often incorrectly answered, with 3.12 hours by far being the most common incorrect response. Answers in part (b) showed that a number of candidates did realise that they needed the total distance divided by the total time. Unfortunately the notation used for 3hours 30minutes in the calculator, as 3.30, lead to incorrect responses from this incorrect method. A few candidates decided incorrectly to find the average speed of each part of the journey then average these, obviously wrong as they were looking to average an average.
5	In part (a), many candidates did extract the correct information from the stem of the question, with attempts to calculate 12% of 3063000. However, there were some errors with place value through transcription errors from the question, this was also true in other parts of the question. Many incorrect assumptions merely repeated the answer given in their calculation. In part (b) a number of candidates realised there was a need to find the difference between the population and the number of women, but were unable to express their result as a percentage of the population. In part (c) the calculation of 30% of 3092000 was often correct, 927600 people. The most demanding part of the question seemingly being the requirement to give this response correct to the nearest 1000 people. In part (d) there were only a few errors in place value due to the interpretation of 3 million and 6 million, although this was not required, as working in millions here was more efficient. Some candidates did struggle with the interpretation of the question, confusing men and women. Clear labelling of calculations would have helped here.

6	In part (a), although some candidates do not understand the technique required to find an estimate of the mean, many other candidates did. The most common error was in multiplying 25 by 0, 25 × 0 was often incorrectly seen as 25. Mixed responses in part (b). Part (c) was not well answered, few candidates engaged with the first stage of working required, which was 28 × 9, to find the total depth of the snowfall over the 28 days. The most common incorrect response in this part of the question was 63 ÷ 9 = 7cm, which is of course an incorrect method and was not credited with any marks.
7	In part (a), many candidates made a good attempt by starting this question by working towards an estimation of 32 acres. Unfortunately a number of candidates did not really understand what they needed to write as an assumption, some decided to just copy out their answer. The assumption required could simply have been the number of alpacas they had decided to use and perhaps why. Assumptions such as whether 'all the land was suitable' were also acceptable. The scale drawing in part (b)(i) was not well done. There was no need to use a pair of compasses, although many spurious arcs were seen. Part (b)(ii) was not well answered. Few candidates engaged with the use of volume of a cylinder. Many candidates were seemingly also not aware that 1 litre is 1000 cm^3. Many candidates in part (c) started using knowledge of change of currency, however decisions on whether to divide or multiple caused some candidates a problem. Surprisingly, some candidates did not give the yearly amounts of money correct to the nearest penny, with £164.099... causing the greatest difficulty. Some candidates did this in stages, rounding up mid process and then rounding again at the end leading to answer in the correct range but not the exact answer.
8	Many candidates did start by finding the number of balls of wool needed and the cost of this wool, for either 1 pair of socks or for 40 pairs of socks. Candidates along the way had assumed wool could be joined already, so this was not the reason for allowing rounding 6.75 balls up to 7 balls. The only reason for allowing this was that it did not state that all the socks were made from the same colour of wool! A number of candidates forgot to pay Rowena's sister for knitting the socks. Working to give percentage profit was not well done, with many candidates not attempting this part of the question or incorrectly using sales as the denominator instead of costs.

9	In part (a), many candidates struggled to work out the lengths of GD and DH from the ratio information given in the question. However, working with Pythagoras' Theorem was followed through. This was not many candidates strength; there were often snippets of knowledge of the theorem given, with evidence of writing powers of 2, but not necessarily adding, squaring or finding the square root. This was not secure knowledge. In part (b) a number of candidates did not see the perimeter of the flowerbed as the sum of three lengths. It was important to round up the perimeter to a whole number. A few candidates rounded up the sides of the flowerbed, rather than using the flexible strip. It is important for candidates to engage with the information given in the question when it comes to rounding numbers.

MATHEMATICS NUMERACY – (NEW)

GCSE

November 2017

UNIT 2 – HIGHER

The vast majority of candidates appeared to have had sufficient time to attempt all the questions, and the paper differentiated well. The majority of candidates performed well on questions at the lower end of the paper, but some of the questions at A and A* proved difficult for a number of candidates.
This report will focus on common errors and misconceptions to aid the interpretation of the item level data available to all centres.

Candidates need to be aware of the following points:

- The need to ensure that the measurements used in area and volume calculations have consistent units.
- Bearings are angles measured clockwise from North.
- A monthly interest rate multiplied by 12 gives the nominal interest rate per annum.
- A clear and accurate description is needed of how to use an extract from a random number table to generate a sample.

Q1
In part (a) there were a lot of fully correct answers. The usual mistakes in estimating the mean were seen, with some using the upper and lower bounds, and a mixture of both for their mid-points. Some multiplied the frequencies by the width of the group which gained no credit. Also, instead of dividing the sum of the mid-point × frequencies by 31, some divided by 4 or 5.

Part (b) was not that well answered, with the first and last statements incorrectly answered by a number of candidates.

Some candidates did not attempt part (c). There were lots of fully correct answers however. Some started with 27 x 7 instead of 28 x 7, and no credit was given in this case. An incorrect method of 63/9 was another commonly seen mistake.

Q2
Part (a) was answered well on the whole. Candidates were generally successful at converting 13 hectares into acres using the 2 steps of conversion, and used this to find the number of alpacas they could keep on the land. In the assumption, examples of commonly seen responses that were given credit were ‘They keep 5 alpacas per acre’, ‘All their farmland was suitable for keeping alpacas’.

Part (b)(i) was not very well answered. You would expect to see a line drawn parallel to the south fence and the bisector of the angle between the south and east fences. One of these was seen usually, together with at times a line drawn parallel to the east fence. The location of the centre of the circle was very often given after drawing just 1 of the lines. It was disappointing to see a number of incorrectly sized circles considering the simple scale, together with at times evidence that compasses and rulers were not available to candidates. In (b)(ii) most candidates knew the formula for the volume of a cylinder and many rearranged it correctly to find the height of the container. However, not many were able to convert the measures given in the question into consistent units to use in their calculations, therefore losing marks.

In part (c), most candidates used a correct method to deal with all 3 transactions. Errors occurred sometimes when candidates worked through their method in stages, and rounded prematurely before continuing with their method. Other candidates failed to see the need to give the value of each transaction correct to the nearest penny before adding the amounts. They had to read the question carefully to see the need for this.

Q3
The vast majority of candidates engaged well with this question. It was pleasing to see that candidates gave appropriate labels and units in what was the OCW question for this paper. Most candidates showed correct calculations to arrive at the total costs to make the socks and the total sales from selling them. Some chose to work out the profit before changing this into a percentage, whereas some chose to use total sales ÷ total costs to arrive at the percentage profit. The common mistake in their percentage calculation was to use the total sales as the denominator in the fraction when profit was used.

Q4
Part (a) of this question was answered well on the whole. Some candidates did not calculate the correct lengths of GD and DH, but most went on to use Pythagoras' theorem correctly to calculate the length of GH.

In part (b), the majority calculated the correct perimeter and correctly went on to calculate the cost of the strips needed. Some candidates rounded the lengths up first which was not correct for this question. Also, a small number could not convert from m to cm correctly.

Q5
A number of candidates gained full marks in this question, but it was not well answered on the whole. The most common error seen was to use the multiplier 1.031. Others worked out 0.31% of 7500 = 23.25, then treated it as a simple interest question by calculating 500 ÷ 23.25 to give an answer of 22 months.

Q6
It was disappointing to see the number of candidates who could not correctly work out the acute angles inside the triangle using the bearing given from Molk. A significant number thought these angles were greater than 90 degrees. No credit was given for any attempt at trigonometry in this case. Most worked with the last part of the question correctly. Follow through working with speed, distance and time was only allowed if trigonometry had been attempted to calculated the distance Molk to Lindat. A number could not convert their decimal number of hours into hours and minutes correctly though, to work out the time of arrival.

Q7
In part (a) a number of candidates were able to work out the monthly interest rate of 0.5%, but only a minority understood how to arrive at the nominal annual interest rate from this. This was disappointing as all they had to do was multiply this by 12.

A similar amount of success was seen in part (b) where a number of candidates correctly substituted values into the AER formula. Follow through from their final answer to part (a) was allowed here.

Q8
The majority of candidates used a correct strategy here of calculating the arc length of the sector, and then to use this in Pythagoras' theorem to calculate the length of icing on an individual cake slice. A number did not use the correct formula for the arc length, but a significant number used Pythagoras correctly and understood that 18 of these slices would make up a whole cylindrical cake.

Q9
In part (a), most candidates gained at least 1 mark, but there was not one single statement that caused the most difficulty.

Part (b) was not well answered, but better efforts were made compared to Autumn 2016. Very few candidates numbered the engineers appropriately from 01 to 50.

Most candidates engaged well with part (c) of the question. Many though failed to realise it was a bounds question, and this limited greatly the number of marks available to them. Some used the lower bounds of the measures given, rather than the upper bounds. Other errors seen were including the area of a rectangle of size 24 by 43, and calculating volumes rather than surface areas.

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