GCSE EXAMINERS' REPORTS

GCSE (NEW)
MATHEMATICS – NUMERACY

NOVEMBER 2020

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MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 1 FOUNDATION TIER

General Comments

The paper differentiated well, with different styles of questions and a graduation in the level of difficulty. Several candidates found the longer style questions demanding as anticipated.

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.

A few candidates did not attempt to answer question 5b as it involved using both a protractor and a ruler.

Comments on individual questions/sections

Candidates need to be aware of the following points:

Q.1 Many candidates engaged with this question; however, it is evident that some candidates do not know the different types of numbers, especially multiples and square numbers. This was particularly evident in (a). In (ii), common incorrect answers were 24 and 27. Candidates did not connect the multiple of 6 and divisibility by 9. In (iii), several candidates gave 25 as the answer, although many other incorrect answers were also given.
Part (b) was well answered, although there were some incorrect answers of 80 007.
Several candidates in part (c), were able to reason that 25 miles was far too long for the length of a swimming pool; however, this is an area that needs to be improved.
It is evident that many candidates know the names of 3D shapes as part (d) was answered well.
Part (e) was very well attempted and those candidates that can work with time usually gained all the marks; however, it is evident that some candidates cannot work out time when it goes over the hour.

Q.2 This question was answered quite well by candidates. The area that they found most difficult was part (c) where the common incorrect answer was size 13 rather than size 12. Several candidates did not spot the pattern and it may have helped some candidates if they had drawn the next few diagrams for them to answer some of the question. Many candidates understood that that they needed to add 2 every time although some did think that you did double or even multiplied by 3 to make the next size up.

Q.3 Most candidates engaged with this question and were able to pick up at least 2 marks. This was usually from finding 20% of £1200. Many candidates do not understand what a third is; several of them divided by either 2 or 4. A common incorrect answer for a third of £1200 was £300. Some candidates did not interpret the information correctly with some subtracting 'their 400' from £1200 and then finding 20% of what was left. Candidates did not always organise and communicate their work; not all calculations were labelled, and some calculations were mixed up with others. However, many did use units.

Q.4 Most candidates engaged with this question. Basic errors with addition such as not adding on 'carries' or putting the wrong number in the box occurred in part (a).
In part (b), some candidates were able to say that the distance run each day was roughly the same; although some found it difficult to explain. Some confused 5.07km with 5.7km and some said that they were approximately the same as they were between 5km and 6km.
Part (c) was quite well explained by candidates; however, part (d) was not always interpreted correctly. Some candidates do not understand what the word difference means in Mathematics. Several candidates just gave a written explanation stating what the least and greatest times were with the distances run and calories used. Those that did attempt the subtraction often gave an incorrect answer of 1:51, 2:51, 1:49 or 2:49. Adding and subtracting time is an area that candidates, at this tier, find difficult.

Q.5 Part (a) was well attempted; however, some candidates subtracted 35° from 180° or even 360° for the answer of angle *x*. Some candidates appeared to measure the angle rather than use basic angle properties to find the answer.
Part (b) was not well answered. Some candidates did obtain 2 marks for measuring the sides of their triangle and using the scale. Many candidates were not accurate in their measuring and often measured sides to the nearest cm rather than the nearest mm. The angle of 78° was sometimes 75°, 82° or 68° and 53° was sometimes 50°.

Q.6 Many candidates engaged with this question. The main error was in finding the cost of 1.5kg of blueberries and some did not even engage with finding the cost of the blueberries. There were a number of errors in subtraction, such as £20 - £6.80 incorrectly given as £14.20 or thinking 'smallest from largest in column subtraction leading to £14.80. Some candidates struggled with the idea of finding how many £3.60s there are in £7.20, using a trial method, rather than considering an exact calculation of division.

Q.7 In part (a), candidates had different ideas of how many weeks there are in a year, with exactly 4 weeks in each of 12 months being very commonly seen. Although there were many errors in calculations, several candidates engaged with the aspects within the question; however, some candidates omitted the cost of buying the dog and some worked out the individual costs and did not find the sum of them.
In part (b)(i), several candidates did use the conversion given with most of these candidates getting 25 cm is equivalent to 10 inches correct.
In part (b)(ii), most candidates do not know that 1 kg is approximately 2.2 pounds, as stated in the specification. Without this knowledge the mass could not be found.

Q.8 Very few candidates were able to gain 2 or 3 marks in this question. Some candidates were able to identify y correctly as 115 using angles on a straight line. However, very few candidates understood the angle properties within parallel lines.

Q.9 Part (a)was quite well answered with many correct answers seen.
In part (b), very few candidates were able to find the median from the graph. The most common incorrect answer was 2.5.

Q.10 Part (a) was well attempted, with many candidates gaining 2 marks. The 48 flags were important in this question and many candidates did not engage with this fact. Those that did were often able to the cost of the ingredients and some were able to find the cost of the muffin cases but there were errors in finding 3 lots of 22p.
In part (b), a common incorrect answer was 80%. Many candidates found the profit, £3.20 correctly but did not know how percentage profit is calculated.

Q.11 In part (a) some candidates stated, 'no correlation', as given, but did not interpret what this showed.
Many candidates did select 7 birds in part (b). A common incorrect response was 3 birds.

Summary of key points

- Knowledge of conversion facts, as stated in the specification, is essential.
  For example: 1 kg ≈ 2.2 pounds.

- Candidates need to be aware that percentages can be greater than 100 especially when considering percentage profit, which should be considered as 100 × profit ÷ cost.

- Candidates need to remember when working with time, that there is only 60 minutes in an hour and that the usual method for adding values cannot be used with time.

- Candidates need to be aware of what sensible units are used in everyday life.

- Candidates need to know that a third is $^1/_3$ and that they need to divide by 3 and is not ½ or ¼.

- Candidates need more practice of drawing diagrams accurately with ruler and protractor and also the use of a scale.

MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 1 INTERMEDIATE TIER

General Comments

The paper differentiated well, with different styles of questions and a graduation in the level of difficulty. A number of candidates found the last couple of questions demanding as anticipated.

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.

A few candidates did not attempt to answer multiple-choice questions.

Comments on individual questions/sections

Candidates need to be aware of the following points:

Q.1 Many candidates engaged well with this question. There were a number of errors in subtraction, such as £20 - £6.80 incorrectly given as £14.20 or thinking 'smallest from largest in column subtraction leading to £14.80. Some candidates struggled with the idea of finding how many £3.60s there are in £7.20, using a trial method, rather than considering an exact calculation of division.

Q.2 In part (a), candidates had different ideas of how many weeks there are in a year, with exactly 4 weeks in each of 12 months being very commonly seen. Although there were errors in calculations, many candidates engaged well with all the aspects within the question; however some candidates omitted the cost of buying the dog. Generally candidates did organise and communicate their work fairly well, with units given and calculations labelled. However, there are always some candidates who go straight to working out an answer without thinking about OCW marks.

In part (b)(i) many candidates did use the conversion given, some candidate chose to attempt division rather than the multiplication required.

In part (b)(ii) a number of candidates do not know that 1 kg is approximately 2.2 pounds, as stated in the specification. Without this knowledge the mass could not be found.

Q.3 In part (a)(i) there were many reflex angles given, not considering where to 'look from' to find the bearing. A number of candidates did measure the correct angle, but wrote an answer as this angle rather than a 3-figure bearing.

The correct response, Corwen, was seen in (a)(ii).
In part (b) it was clear that a number of candidates do not appreciate the units of measure within a map scale.

Q.4 A number of candidates made errors in simple calculations, but generally many candidates were able to find some or all of the missing angles.

Q.5 In parts (a) and (b), correct answers were seen, with 2.5 being a common error in both parts.

Part (c) was not well answered, as candidates did not engage in sufficient detail with the graph, although some stated the median would be the 42^{nd}, 42.5^{th} or 43^{rd} person, but gave an incorrect conclusion.

Q.6 Part (a) was reasonably well answered, with many candidates engaging with the different parts. The 48 flags were important in this question. Errors with place value in money were seen, but the most disappointing error was caused by poor handwriting, with some candidates reading their correctly evaluated £0.66 or 66p in further working as £0.60 or 60p.

In part (b) a common incorrect answer was 80%. Many candidates found the profit, £3.20 correctly but did not know how percentage profit is calculated.

In part (c) although many correct responses were seen, 90p was a common incorrect response (incorrectly deciding to add 60p and 30%, 60 + 30??).

Q.7 Candidates in part (a)(i) did correctly select 'can't tell', but others decided it was Tuesday (may the second point from the left, so thought Monday then Tuesday and so on??).

In part (a)(ii), although 'No' was often selected by candidates, it wasn't backed up with a reason.

In part (b)(i) some candidates stated, 'no correlation', as given, but did not interpret what this showed.

Many candidates did select 7 birds in part (b)(ii). A common incorrect response was 3 birds.

Candidates found part (b)(iii) quite demanding, it needed careful reading of the scatter graph. A few candidates misread the point at 1.5 m.p.h. as 1.4 m.p.h.

Q.8 Although many correct methods were seen in part (a), there were sometimes errors in calculation, such as 66.36 divided by 6 to incorrectly give 11.6, instead of 11.06. A few candidates divided by 11 to start, as if starting with the total cost of the tent, which was incorrect.

In part (b) apart from errors with arithmetic, the most common error was not considering year on year increase in costs. These candidates added £1.20 on twice.

Candidates found part (c) of this question demanding. A few candidates found the area of the trapezium to be 2.4m^2. Others made no progress, or incorrectly decided to work with perimeter.

Q.9 Many candidates found this question demanding and did not interpret the planting instructions accurately. There were vertical lines drawn, but not necessarily in the correct position.

Q.10 This question was not well answered. Many candidates completed the table in (a) by repeatedly adding 25, which was not correct, as repeatedly adding 75 (from 600 divided by 8) was required.

Candidates seem to lack knowledge of how the first person should be selected.

Q.11 Candidates found both parts of this question demanding, showing little understanding of interpretation of a straight-line graph. This question was not well answered. A few candidates were awarded a mark for the sharing of the £500 between the number of tickets.

Q.12 In part (a) candidates struggled to convert units when considering area.

Candidates found part (b) demanding, as many candidates do not engage with the concept of reverse percentage.

Q.13 Many candidates did not have a strategy to look at the individual triangles in order to find the area of the cross-section. This question was not well answered.

Summary of key points

- Knowledge of conversion facts, as stated in the specification, is essential.
  For example: 1 kg ≈ 2.2 pounds.
- Candidates need to be aware that percentages can be greater than 100 especially when considering percentage profit, which should be considered as 100 × profit ÷ cost.
- Candidates should take care to read their own handwriting correctly, such as distinguishing between the digits 0 and 6.
- With geometrical situations, described diagrammatically, candidates need to experience the breaking down of a task in order to apply skills related to area and perimeter.

MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 1 HIGHER TIER

General Comments

The majority of candidates appeared to have had sufficient time to attempt all the questions, and the paper differentiated well. Candidates generally performed well on most of the questions at the lower end of the paper, but some of the arithmetic involved in the A and A* questions did cause problems to some and may have resulted in these candidates failing to complete the paper.
This report will focus on common errors and misconceptions to aid the interpretation of the item level data available to all centres.

Comments on individual questions/sections

Q.1 In part (a), more success was seen in (ii) where the majority of candidates either stated that the correlation last week was negative (inferring next week would be the same), or that you can't predict the weather. In (i), a number incorrectly worked with readings on the rainfall scale.
More success was seen in part (b) of the question compared with (a)(i), with many gaining both marks. This was somewhat surprising as it was assessing a similar skill.

Q.2 The majority of candidates showed good understanding of the methods needed in parts (a) and (b) of this question. Some made basic arithmetical errors in both parts, however. In (a), the division of £66.36 by 6 proved difficult for some, while in (b), some candidates who chose to calculate 5% by first writing the value of 1%, lost accuracy (1% of £25.20 for the 2nd year's increase was £0.252).
Many correct responses were seen in part (c) also, although a number of candidates used poor mathematical form to present their work.

Q.3 This loci question was not answered well on the whole. More success was seen with the drawing of the line parallel to the fence compared with the angle bisector. Some candidates arrived at the correct place to plant the tree by drawing a line parallel to the house and 5 cm away from the house rather than drawing the angle bisector.

Q.4 Adding 25 each time was a common mistake in part (a) of this question. Those who knew that they needed to add on the result of dividing 600 by 8 each time, generally went on to gain both marks. Part (b) could have been answered better, with only some showing understanding that the first person is selected at random.

Q.5 Very few fully correct responses were seen in both parts of this question. Candidates either failed to see the need to subtract the cost of the room hire from the total cost, or failed to add the £500 on to the total cost before calculating the price per ticket in each case.

Q.6 Most of the correct answers in (a) came from those candidates who chose to convert the dimensions of the card into mm before calculating the area. Few knew how to convert from m^2 into mm^2. It was pleasing to see many correct answers in (b), showing candidates knew how to deal with reverse percentage questions.

Q.7 This question proved difficult for a number of candidates. Those who chose a correct strategy tended to go on to gain full marks, with most calculating the area of the 6 congruent triangles before calculating the volume of the prism. Some chose to calculate the area of 2 congruent trapeziums, but more errors were seen with this method.

Q.8 The majority of candidates who used the method shown in the mark scheme went on to answer this question well. Very few who used the table method, altering two of the values at a time, showed a good understanding of the method and frequently gained no marks.

Q.9 Part (a) of this question was answered the best, with many correct answers observed, although a number of candidates failed to simplify their initial fraction correctly. Part (b) of this question required candidates to show an understanding of repeated proportional depreciation, but few gave correct responses, especially when it came to giving a general formula for the value of the motorcycle after a number of years. Many failed to see the need for brackets when raising a fraction to a power.

Q.10 The majority of candidates answered parts (a) and (b) of this question well, showing good understanding of how to calculate frequencies from a histogram. Far less success was seen in part (c), with a number of candidates thinking that calculating ¼ of 90 and ¾ of 90 would give them the values of the quartiles. Part (d) if anything was worse, with few showing an understanding of the meaning of the inter-quartile range.

Q.11 Few fully correct responses were seen in part (a). Calculating fractions of amounts to give non-integer answers proved too difficult for many. Most failed to see that 12/72 simplified nicely meaning that the frequencies merely had to be divided by 6.
Even less success was seen in part (b). Many candidates who showed a correct equation lost marks due to their inability to clear the fractions that were part of their expressions. Most of these chose to convert their fractions to decimals, and accuracy was lost.

Q.12 Most candidates knew that they needed to calculate areas in part (a), but disappointingly many worked with areas of rectangles. Even less success was noted in part (b), with few showing an understanding that average speed is calculated from total distance travelled divided by total time taken.

Summary of key points

- Very few candidates showed a good understanding of how to use a table method to solve problems involving direct and inverse proportion. Using the method shown in the mark scheme for this paper produces straightforward calculations that candidates are far more successful with.

- Questions on stratified sampling in the non-calculator paper will invariably involve numbers that will cancel nicely, but many candidates fail to show an understanding that their calculations can be simplified in this way.

- Equations involving fractions are best answered by clearing the fractions by multiplying all terms of the equation. Converting fractions to decimals invariably introduces error.

MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 2 FOUNDATION TIER

General Comments

The entries for this series were small.

The paper differentiated well, with different styles of questions and a graduation in the level of difficulty. The paper contained questions that were accessible to the whole range of ability.

As commented on in previous series, a calculator paper is designed to assess the use of the calculator. Although non-calculator methods can yield correct responses, they often increase the difficulty of the question and result in unnecessary errors. Candidates should be encouraged to use a calculator as much as possible on Unit 2 but must remember to show their working where appropriate.

A few candidates did not attempt to answer multiple-choice questions.

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.

Comments on individual questions/sections

Q.1 Many correct answers were seen in part (a). Many engaged with the context and understood how to calculate the year.
It was extremely pleasing in part (b) to see so many candidates engage with the question. Many correct answers were seen, and several candidates managed to gain part marks for partially-correct answers. Many benefitted from the follow through mark for interpreting who won and by how many points.
In part (a) and (b) several errors were introduced when non-calculator methods of calculating were used. Candidates should be encouraged to use their calculator.

Q.2 Part (a)(i) was a very well answered question.
A number of candidates knew the method of finding the mean in part (a)(ii) of the temperatures, however some did not get the correct total of 66 as they had difficulties adding negative numbers.

Both parts of 2(b) were well answered. Candidates engaged well with the information in the timetable and a number of correct responses were seen.

Part (c) assessed the quality of organisation, communication and accuracy in writing. It was very pleasing that many candidates were aware that this was OCW question and had attempted to structure their responses logically with labels attached to the different parts of the question.
Many candidates managed to score 4 marks out of the 6 marks available for the mathematical content. Many understood how to find the additional charges for one or both flights and the cost of the 4 flights.

Often the final M1A1 were lost as candidates failed to total the flight costs and the 3 additional charges for both flights. Some only considered the total for one flight.
It was pleasing to see that most candidates used a calculator efficiently.
As this question had a number of different parts, labelling their working was essential.
Incorrect mathematical form in working involved incorrect use of the equals sign, forgetting to include units and writing amounts of money incorrectly, such as £1035.8.

In part (d), 2 marks were awarded for *No* selected and a full explanation including appropriate calculation referring to a cm ↔ mm conversion. Many gained E1 for stating that the dimensions of Tomos's rucksack were less, but without showing how. 1 mark was awarded for *No* and at least one correct conversion seen.

A number of correct answers were seen in part (e). Many identified the skis that were parallel. Some chose the skis that were perpendicular. I doubt whether a skier would get very far with their skis in this position!

Q.3 A number of candidates gained the first M1 mark in part (a) for showing evidence of counting squares to find the area. Methods included showing dots or numbering the squares. Those that had an area outside the range accepted, could still gain the following M1A1 M1A1 marks by correctly finding the correct number of tins.
Some candidates did not get a whole number of tins or incorrectly rounded down their answer
e.g. correct method used to find an area of 61 $m^2 \div 5 = 12.2$ tins so 12 tins.
$12 \times £32.70 = £392.40$.
This response gained M1 A0 (area out of range) M1 A0 (should be 13 tins) M1 A1 correct total cost for their number of tins.

Candidates could only gain the final A1 if a whole number of tins was used.
For example, correct method used to find an area of 61 $m^2 \div 5 = 12.2$ tins
$12.2 \times £32.70 = £398.94$.
This response gained M1 A0 (area out of range) M1 A0 (should be 13 tins) M1 A0 correct method but not a whole number of tins used.

Candidates should be encouraged to show all their working.

Questions 4 to 8 were common with the Intermediate Tier

Q.4 Many candidates did not engage with the reductions in part (a), instead calculating with 3/7 and 26%. Other candidates calculated the reduced cost. Candidates seem not to like to work with fractions, so converted to a decimal initially, but lost accuracy due to premature approximation.

In part (b), a common incorrect selection was 2/3.

Q.5 Many candidates did compare like with like, with comparison in pounds per kilogram being the most popular and the easiest to interpret.
Candidates working with kg/ £ often then misinterpreted their comparison.
A number of candidates tried to compare 'about 25 kg' (12·55 × 2 and 12 × 2) which was not accepted.

Q.6 Parts (a), (b) and (c) were fairly well attempted. However, the selection of 1 was a common incorrect response in part (a) and the selection of 20 was a common incorrect response in part (c).

There were many problems in part (d), with few candidates knowing how to express answers as a percentage by selecting the appropriate fraction. Some candidates considered 4 out of 30 pupils, rather than out of 34 pupils, this was a common error.

Q.7 Part (a)(i) and (a)(ii) was not very well answered by candidates. Naturally, candidates found engaging and understanding a pie chart demanding. A few candidates did not show evidence of measuring any angles in the pie chart. This may be that they did not have the correct equipment in the examination.

In part (b), some candidates calculated 330 people who preferred frozen or tinned peas, but many of these candidates did not interpret 'twice as many' correctly, proceeding then to halve 330, rather than find ⅔ of these 330 people.

Q.8 This question was not well answered at all, with few candidates understanding how income tax rates and bands work.
Candidates do not generally know how to apportion the income across the different rates of tax.
Drawing a diagram seems to aid candidate understanding.

Summary of key points

- Candidates should be encouraged to use a calculator as much as possible on Unit 2 but must remember to show their working where appropriate.

- Candidates should be encouraged to "have a go" at the multiple-choice questions. It is surprising to see a number of this style question not attempted by candidates. Candidates could select an answer even if they are uncertain if it is correct (question 2(b)(i), 4(b), 6(a), 6(b), 6(c))

- By showing all their working for every question, candidates are accessing part marks, even if their answers are incorrect.

- Candidates should practice adding negative values (question 2(a)(iii))

- Candidates should know when to round up and down in real-life contexts (question 3)

- In calculating best value for money options, considering equal quantities or "like with like" is important (question 5).

- Candidates need to be familiar with measuring angles in pie charts (question 7).

MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 2 INTERMEDIATE TIER

General Comments

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.

A few candidates did not attempt to answer multiple-choice questions.

Comments on individual questions/sections

Candidates need to be aware of the following points:

Q.1 Some candidates did not engage with the reductions in part (a), instead calculating with 3/7 and 26%. Other candidates calculated the reduced cost. Candidates seem not to like to work with fractions, so converted to a decimal initially, but lost accuracy due to premature approximation.

In part (b), a common incorrect selection was 2/3.

Q.2 Many candidates did compare like with like, with comparison in pounds per kilogram being the most popular and the easiest to interpret. Candidates working with kg/ £ often then misinterpreted their comparison. Some candidates tried to compare 'about 25 kg' which was not accepted. However, some candidates correctly compared costs for 25kg.
For OCW many candidates did label sections of their work and give units.

Q.3 There were fair attempts at parts (a) and (c), with part (b) well attempted.
The selection of 1 was a common incorrect response in part (a).
The selection of 20 was a common incorrect response in part (c).

There were many problems in part (d), with few candidates knowing how to express answers as a percentage by selecting the appropriate fraction. Some candidates considered 4 out of 30 pupils, rather than out of 34 pupils, this was a common error.

Q.4 A number of candidates worked with percentages of the pie chart in part (a).

In part (b), many candidates calculated 330 people who preferred frozen or tinned peas, but many of these candidates did not interpret 'twice as many' correctly, proceeding then to halve 330, rather than find ⅔ of these 330 people.

Q.5 A number of candidates completed the table correctly, but then did not know how to calculate the mean. A common incorrect method was to find the mean of the means by totalling the means and dividing by 5.

Q.6 This question was not well answered, with few candidates understanding how income tax rates and bands work. Candidates do not generally know how to apportion the income across the different rates of tax. Drawing a diagram seems to aid candidate understanding.

Q.7 Part (a) was reasonably well answered when compared with part (b). A number of candidates did not calculate the number of people aged over 75 who used the internet nor the population who used the internet, instead incorrectly writing 286500/3150000.

Q.8 Some candidates do not know how to write 3.4 million as a number, consequently there were many place value errors. Also. Deciding on whether to divide or multiply seemed to be a problem for some candidates.

Q.9 Many candidates do not know the equivalence given in the specification between miles and kilometres, so were unable to answer part (a) correctly.

There were a number of errors in part (b), including not taking into account the 78 laps and not considering their lap time answer was hours not minutes, so not multiplying by 60. Keeping a track of the units in stages of working helps decide on the later stages.

A common error in part (c) was not to work towards the monthly cost, so not dividing by 12. This was clear and in bold in the question.

Q.10 A number of candidates confuse rounding and bounds, hence a common error is to consider adding 0.4 cm to each of the lengths of the pictures. Candidates are not clear on what is meant by greatest and least values. Some candidates do not engage at all with the statement ‘correct to’ as being a tolerance and a hint to consider the least or greatest bounds.

Q.11 In part (a), a number of candidates did not give an answer in pounds, or calculated first in pence getting an answer in standard form but could not then divide by 100 to get an answer in pounds in standard form.

Candidates with knowledge of volume of a cylinder answered this part (b) of the question well. However, there were many other candidates with little knowledge of volume of a cylinder.

Q.12 In part (a), a number of candidates did not select tan, instead working with sine. However, there were other candidates with little knowledge of trigonometry.

In part (b), there were a mix of the two methods were seen, trigonometry and similar triangle methods. Candidates found the rearrangement in the trigonometry method more demanding than the similar triangle rearrangement.

Q.13 Part (a) was generally well answered, with many correct responses seen. The error ‘43 cars’ was seen from a misread of the scale.

The candidates with knowledge of box-and-whisker diagrams found part (b) of this question accessible. Many other candidates seemed not to have basic knowledge of box-and-whisker diagrams.

Summary of key points

- Knowledge of conversion facts, as stated in the specification, is essential.
  For example: 5 miles ≈ 8 kilometres.

- Candidates need to be aware of the units of their answers in stages of working in order to help decide on the next required stage of working, e.g. if their answer is in hours and they wrote the unit 'hours' they would realise they have not finished working if a question asks for an answer in minutes.

- Candidates need to understand how to express an answer as a percentage, by building the correct fraction first with careful consideration of what the numerator and denominator should each be in this fraction.

- Candidates need to understand why numbers are rounded, with a consistent decision on when to round down or up. And not to confuse this decision with greatest and least bounds; as this is where these decisions are made, not the resulting decisions.

- Candidates should realise the impact of calculating the mean of mean values and why is not good practice.

- Candidate should be familiar with 'millions' and know however to write this number using the appropriate number of the digit zero, especially in such cases when not a whole number of millions, such as 3.4 million.

MATHEMATICS - NUMERACY

GCSE (NEW)

November 2020

UNIT 2 HIGHER TIER

General Comments

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

Comments on individual questions/sections

Q.1 This question was answered well on the whole. Most candidates converted the 35 000 acres into km^2 first, although some chose to initially calculate the number of tonnes per acre. Many incorrect second steps were observed using this first step however, as the conversion into tonnes per km^2 reversed the normal conversion step. This was the OCW question on this paper. A number of candidates chose to present their work by splitting the page in two, with their workings on one side and their explanation of the work on the other. When the explanation is on the right and workings on the left, the work can be more difficult to follow, and this can result in the loss of the Organisation and Communication mark at times.

Q.2 Less success was seen in this question. Most candidates knew how to generate a percentage, but a number used incorrect values in their calculation. The question required candidates to pick relevant information from the stem of the question, and some found this difficult.

Q.3 Again, a number of pieces of data were given in the stem of this question, and candidates needed to choose the correct pieces to work with in the first 3 parts of the question. In part (a), candidates needed to convert a speed from km/h into mph. Some candidates chose the wrong piece of data to convert, while others did not know how to do the conversion. In (b), candidates were required to calculate the average lap time of the winner of the 2007 Monaco Grand Prix. Most candidates successfully did two stages of the calculation correctly, but some failed to see the need to divide the distance covered by the number of laps (78) at some point in their calculations.
More success was seen in (c) and also in (d), with many showing a good understanding of how to convert between 3 currencies.

Q.4 This question on the use of bounds was answered well. Some candidates failed to gain the last mark in the question however, as they failed to show that the shelf could be 1 cm too short.

Q.5 Both parts of this question were quite well answered, although more success was seen in part (b). In (a), errors were either seen in their method or in the writing of their answer in standard form. It was pleasing to see that the vast majority of candidates knew how to calculate the volume of a cylinder in part (b).

Q.6 Both parts of this question were answered well, with candidates showing a good understanding of right-angled trigonometry and similar shapes. Some chose to use an inefficient method to find the angle of lean, using Pythagoras and either the sine or cosine rules. Errors in accuracy were often observed when candidates used this method.

Q.7 Again, both parts of this question were answered well. It was pleasing to see that candidates were able to accurately take readings for the median and quartiles from the cumulative frequency graph to draw their box-and-whisker diagram.

Q.8 Most candidates performed well in part (b) of this question, showing they could use the AER formula proficiently. Far less success was seen in part (a), where it was clear that many did not realise that they needed to use the daily interest rate in their compounding calculation, which should have been found by dividing the nominal rate by 365.

Q.9 Most of the candidates who realised the need to use Pythagoras to find the length of the sloping sides of the triangles generally went on to gain the majority of the marks in part (a) of this question. Some candidates lost accuracy in their cost calculation by rounding prematurely. It was pleasing to see an improved facility in part (b) of the question compared with previous series, with many candidates using the ratio of the volumes of the two coops to correctly find the ratio of the areas.

Q.10 Many candidates answered this question well, gaining full marks. It was vital that candidates divide the APR by 12 to find the monthly interest rate, and a number of candidates however did not do this, using the APR as a decimal in the formula.

Q.11 Both parts of this question were answered quite well. In part (b), the vast majority of candidates were able to use the cosine rule to successfully find the length of the rod, but far less success was seen in their use of the sine or cosine rules to find the angle the rod made with the horizontal. Many candidates who wrote the sine rule with the lengths as the numerators failed to rearrange their equation correctly.

Q.12 The majority of candidates correctly used the 1/2absinC formula to find the area of the triangle in part (a). Far less success was seen in part (b), where a number of candidates either did not calculate sector areas in their workings, or got confused as to which cross-sectional area they were calculating. A number arrived at the correct area, before then subtracting it from the area of the semicircle, meaning they had calculated the cross-sectional area of the water.

Summary of key points

- When answering an OCW question, splitting the page in two, with explanations on the right side of the page can sometimes lead to the loss of the Organisation and Communication mark.

- Candidates need to be aware of how to calculate daily and monthly interest rates from annual rates. An APR is similar to a nominal annual rate for savings accounts, in that it can be easily used to find these rates.

- Candidates need to be proficient at using the sine or cosine rules to find angles in non-right-angled triangles.

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