Province of the
EASTERN CAPE
EDUCATION

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NSC 2016 CHIEF MARKER'S REPORT

SUBJECT	MATHEMATICAL LITERACY

PAPER	TWO

DATE OF EXAMINATION:	31 OCTOBER 2016	DURATION:	3 hours

SECTION 1: (General overview of Learner Performance in the question paper as a whole)

- In some districts some of the centres performed very well while others in the same district performed badly.
- In some districts the performance of learners are overall very poor.
- In general most of the learners performed very poorly in the question paper.
- This question paper is requiring learners to think outside the box, which learners really lack, therefore the poor performance in the paper.
- Learners are challenged when they have to take a real life situation and make sense of it. Therefore they struggle to analyse the questions and reflect and reason about it.
- It is quite scary that learners lack a sense of general knowledge, in other words it seems like learners are not clued up with reality.

SECTION 2: Comment on candidates' performance in individual questions

(It is expected that a comment will be provided for each question on a separate sheet).

QUESTION 1

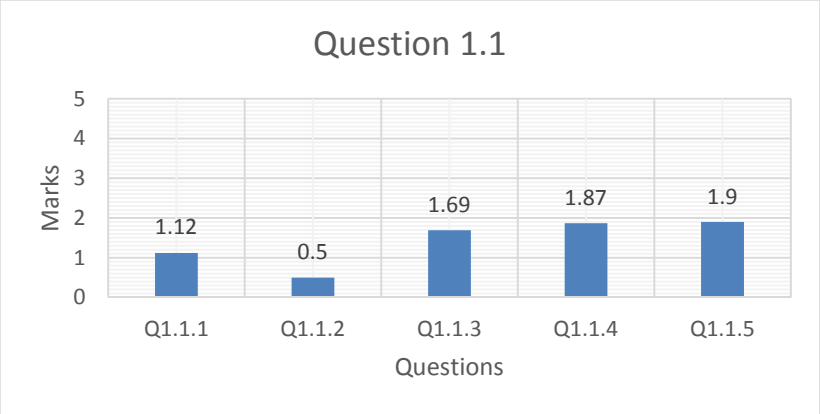
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Average mark from the sample of 100 :		
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE % FROM SAMPLE**
Q1.1	Finance & Probability – Fee structure of banks	33,7%
Q1.2	Data Handling – Global shipment	53,3%

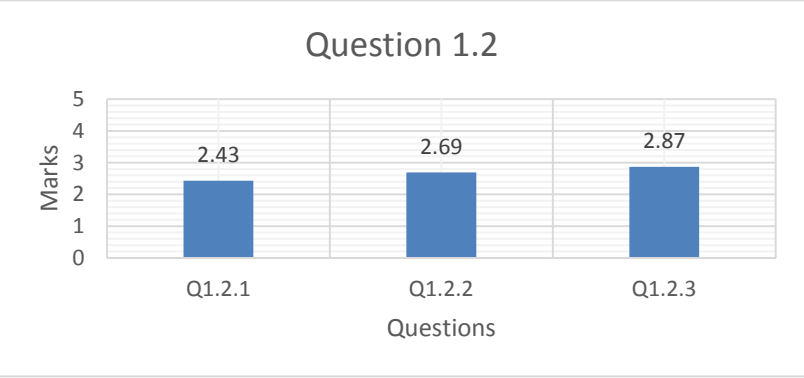
This question was poorly answered by the majority of the learners. It was evident during marking that only the brighter learners could manage to answer this question the way it was supposed to be answered. In other cases learners could not make sense of the given information as well as not having conceptual understanding of the basic calculations.

The following analysis from 100 scripts.

Question 1.1



Question 1.2



From the 100 scripts the average mark for Question 1 is 15,07 (41,9%)

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
1.1 1.1.1 First of all, learners could not work with a calendar. Secondly, they could not find the number of working days where the information was given that the "employees did not work over weekends". They also lack the basic concept of even numbers which is taught since primary school. It was also evident that they don't know how to express a probalitiy and writing it out in words or as a ratio.
1.1.2 Learners struggled to answer this question because they either answer it by referring to lower interest rates, employees will not get paid rather than focusing on the question that refers to "not necessarily use a bank with lowest bank charges". Therefore it can be concluded that learners did not understand the question.
1..1.3 Instead of using the formula for (withdrawal fees for 2014) that was given in the question for Bank X, learners used the withdrawal fees from the table for Bank X (2015). Learners cannot substitute correctly in the given formula and if they substituted, they could not find the correct answer because they either lack calculator skills or do not know how to work with the BODMAS-rule. With the final answer, they did not follow the instruction that says "to one decimal place" and if they have rounded, the rounding was to a whole number or without rounding at all. As the formula indicated x 100%, learners multiplied by 100 and divided by 100 resulting in an incorrect answer.
1.1.4 Again in this question, learners could not work with the given formula for Bank X as well as the calculator skills that they lack and not using the BODMAS-rule, therefore they ended up with the incorrect answers. Or they only calculated the withdrawal fees for Bank X and could not come to a conclusion. For Bank X the did not understand the R1,30 per R100. In the formula 1,15% was given for Bank Y, but learners only used the 1,15 and ignored the %. Some of them did not attempt the calculations and only gave a conclusion.
1.1.5 Most of the learners only used the given weekly wage and multiplied it by 4 to get the monthly wage, instead of first calculating the daily wage for the 22 working days or they multiplied by 5 as there were 5 weeks indicated in the given calendar, ignoring the fact that workers only worked for 22 days. The information therefore was not comprehended before answering the question.

1.2 1.2.1 Learners did not understand the term "global shipment". Learners have a limited general knowledge of what is going on in the world. Answers were given as "storms on the sea OR ships breaking down, etc."
1.2.2 Most of the learners could answer this question to a certain point for example reading the correct values from the table without using the information that stated that the values are given in millions.
1.2.3 Most of the learners could answer this question because they could not use the formula for percentage change. They ended up using the two values for the different years and either add, multiply or subtract these values and mad a conclusion.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- Teach learners how to analyse the given information before attempting to answer the questions.
- More exercise on probability such as outcome of an event and the number of outcomes.
- Teachers must always ask high level questions during teaching of any topics.
- Learners should be taught how to work with given formulae and especially how to substitute and simply these (Especially the use of the BODMAS-rule).
- Teach learners what millions and billions look like in an expanded form. Give many extended opportunities in order for learners to understand.
- Certain formulae learners need to know by heart. Teachers should place emphasis on this.

(d) Describe any other specific observations relating to responses of learners

- The challenge to most learners was the fact that they had to absorb and comprehend the given information. Not only did our second language learners suffer, but also our home language learners.
- Substitution into given formula is still a major concern.
- Calculator skills must be taught throughout all lessons.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Teachers must ensure that their learners know how to work with basic mathematical skills, such as percentage, ratios, fractions in different forms such as decimal fractions.
- Ensure that learners know how to work with calendars.
- To ensure learners know how to substitute correctly in a given formule.
- More workshops to be held on probability.
- Ensure that learners know how to use their calculators effectively.

- Training of teachers especially in areas such as probability.
- To give learners exercises which requires a formula without giving them the formula.

Learners must be taught how to work with large numbers especially when they have to write it in number format,

QUESTION 2

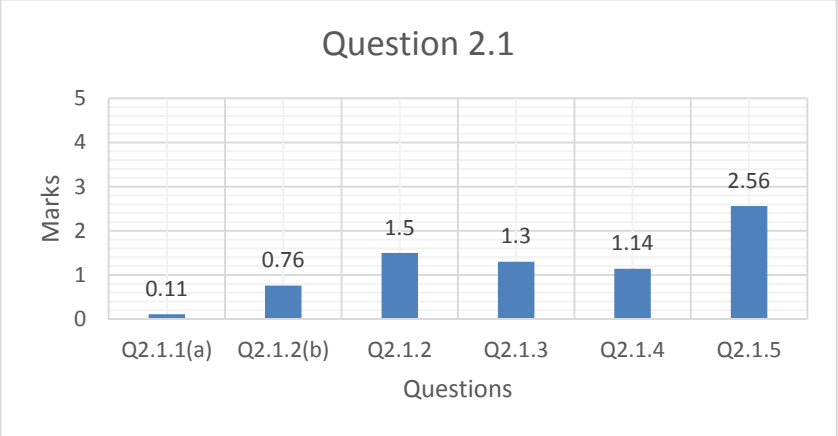
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

In most cases Question 2.1 was answered very poorly because learners cannot work with large numbers such as millions and billions. They also could not make sense of the given information in Annexure A and B.

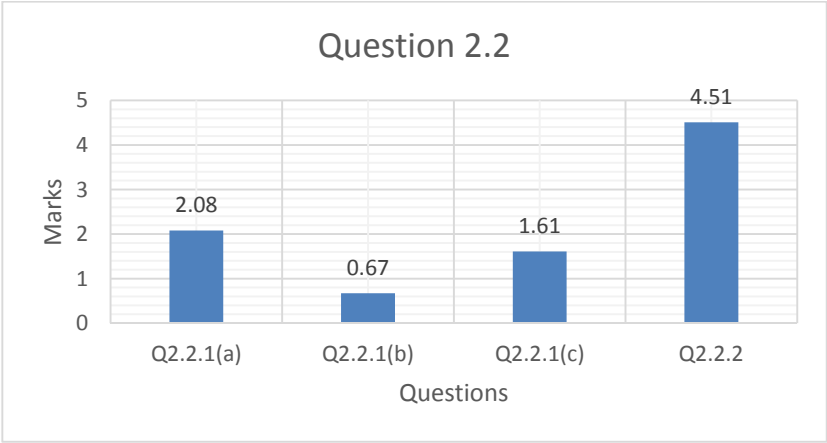
Average mark from the sample of 100 :		
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE % FROM SAMPLE**
2.1	Finance and Data Handling – Tourist spending	33,5%
2.2	Measurement and Finance – Train schedule and train fares	33,7%

The following analysis from 100 scripts.

Question 2.1



Question 2.2



From the 100 scripts the average mark for Question 2 is 16,25 (34,5%)

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
2.1 2.1.1 (a) The majority of the learners could not calculate this, which is in fact the same as a question with VAT included. Learners cannot work backwards (from the increased price to the original price). The most common mistake made was that they only calculated the 9,7% and left its as a final answer. (b) Learners don't not know what the implication is when money is rounded to one decimal place or to a whole number. Most of them only choose appropriate or not appropriate with either the incorrect explanation or not giving a reason for their choice.
2.1.2 Learners could easily find the percentage of R218,9 billion, but not the average per visitor because of the fact that they could not convert the billions to millions. Therefore it was evident that learners don't know how many zero's a million or billion consist of.
2.1.3 Generally this question was well answered except for instances where learners added a third and fourth item or two items where one was incorrect.
2.1.4 Learners could not relate to the term "tourism related items". A variety of answers were given even when some of them were not a tourism related item.
2.1.5 Most of the learners used the compound interest formula even it is not prescribed in the CAPS document. When they used the formula, the substation was incorrect and the lack calculator skills. They lack the skill of writing large values in expanding form. They could not

convert billions to millions including rounding.
2.2.1 (a) Learners cannot work with time (finding out how long a train stopped between stations). Especially when it goes from one hour into the next hour. Some learners just added the arrival and departure times as given in Annexure B. (b) Because they could not find the individual stopover times in (a), therefore they ended up with the incorrect modal value. Some learners do not understand the concept of modal value. (c) Learners could not read the start and end time of the trip from the train schedule, therefore could not determine how long the trip was. Also forgot to subtract the stopover times from (a). Although learners could substituted into a given formula, they still struggled to change the subject of the formula. Learners could not convert minutes to a part of an hour for example 19hours 54 minutes, they use as 19, 54 to do the division instead of converting the 54 minutes to a part of an hour.
2.2.2 As this was a question where there was a lot of calculations to be done, learners could not arrange it in an appropriate manner in which markers could make easily sense of it. They played around mixing the January and February costs. Learners did not adhere to the information of peak season and off-peak season and just randomly used any values.

(c) Provide suggestions for improvement in relation to Teaching and Learning
• Learners should be taught how to work from new value to the original value when working with a percentage which is based on the same principal as a VAT inclusive question and then finding the price before VAT. • Teach learners what the financial impact is of rounding a value to a decimal places instead of rounding to a whole number. • Learners should be taught how to work with large numbers especially millions and billions in number format as well as converting large number from billions to millions and vice versa. • Teach learners how to analyse charts, tables and graphs other than what they are used to especially pictographs. Expose learners to different type of graphs. • Avoid teaching learners how to work with the compound interest formula as it is not prescribed in the CAPS document. Learners should be taught to do it as a step-by-step solution. • Learners should be taught how to work with time scenarios and be able to add and subtract time using hours and minutes. • Teach learners how to work with bus and train schedules in order to make sense of it. • Make sure learners understand the concept of a modal value.

- Where questions require the calculation of speed in km/h, learners should be taught that if the time has includes minutes, they first have to convert the minute to a part of an hour.

(d) Describe any other specific observations relating to responses of learners

(d)Describe any other specific observations relating to responses of learners

- Learners cannot work backwards to find the original value if a percentage is given.
- Converting millions to billions and vice versa is extremely challenging to learners to work with let alone writing it in number format.
- It seems like teachers put too much emphasis on the use of the compound formula which should actually be avoided.
- Time calculations was really a challenge to most of the learners.

Also the fact that they could not read and interpret the train schedules.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Not to teach the compound formula at all.
- More training or workshops for teachers on aspects such as large numbers millions and billions to be written in number format.
- Subject Advisors must ensure that teachers do not deviate from the CAPS document.

More intense training should be conducted by Subject Advisors especially in schools where learners perform very badly.

QUESTION 3

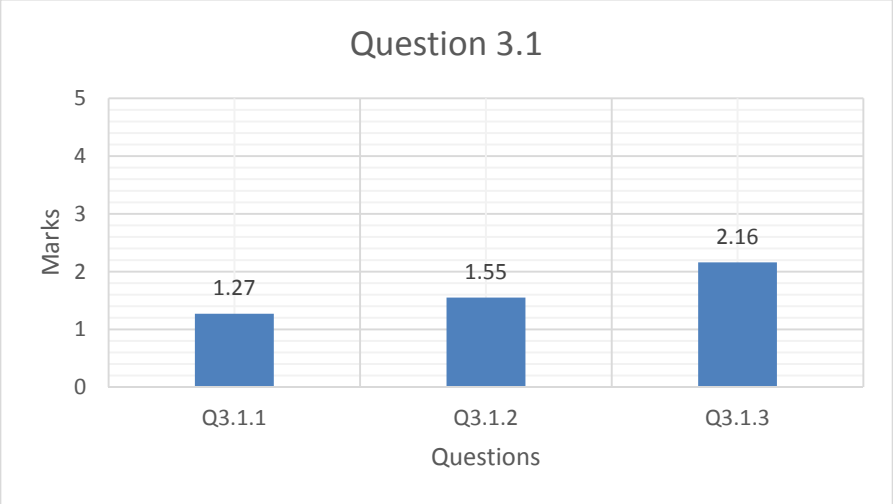
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

In general this question was answered from poor to fair. In Question 3.1, learners have the basic knowledge of the concepts of measurement, but find it difficult to apply. In Question 3.2, learners find it difficult to interpret the data and the box and whisker plots that were given in Annexure C.

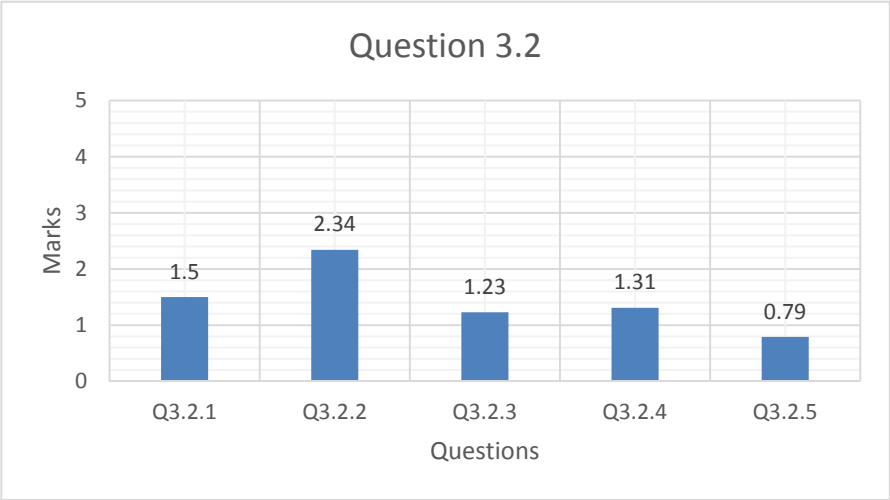
Average mark from the sample of 100 :		
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE % FROM SAMPLE**
3.1	Measurement – Swimming pool	35,8%
3.2	Data Handling & Probability – Attendance at swimming pool	41,64%

The following analysis from 100 scripts.

Question 3.1



Question 3.2



From the 100 scripts the average mark for Question 3 is 12,19 (39,3%)

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
3.1 3.1.1 Learners were unable to identify the correct dimensions of the different sections and substituted any value into the given formula. They used trial and error to prove that the capacity is 765m^3.
3.1.2 Some learners could not find the percentage of the volume as well as converting m^3 to liters although a conversion note was given in the key information.
3.1.3 For this question conversion of days to hours especially the ½ day was a challenge. Learners could only manage to answer this if the conversion from days to hours was correct.
3.2 3.2.1 Learners don't know how to apply the concept of the mean especially if some values are omitted.
3.2.2 Most of the learners could answer the IQR from the box and whisker plot. Instead of finding the IQR for afternoon, they determined the IQR for morning.
3.2.3 Most of the learners could identify with the question.
3.2.4 Although some learners managed to find the correct probability, others used the incorrect information.
3.2.5 Instead of giving reasons based on the information and the box and whisker plots, they only wrote down the values from the information with no interpretation.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- More extended opportunities should be taught to learners especially when it comes to 3-dimensions shapes.
- When conversion tables are given to learners, they should be taught when you need to multiply or divide using the information.
- Teachers learners how to convert from days to hours and vice versa especially when it comes to a part of a day.
- Central tendencies especially the mean should be taught not only they are used to, but also when values are omitted.
- Teach learners to avoid writing probability as a ratio or in word format.
- Teachers should teach learners how to reason when working with a box and whisker plots and not only how to read from it.

(d) Describe any other specific observations relating to responses of learners

- Learners do not have a clue as to how to work with different shapes or pats of it.
- Conversions of days to hours and vice versa was a huge challenge to learners.
- Learners could not work with central tendencies such as mean, especially when some of the values in the data were omitted.
- Learners also find it difficult to interpret and make sound decisions when data is given.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- More intensive workshops should be given to teachers on Measurement especially working with 2- and 3-dimesional shapes.
- Learners should become familiar with these 2- and 3-dimensional shapes through more extended opportunities guided by the teacher.
- Within each and every lesson, teachers should get learners to reflect and reason on information given in order to make sense of it to make informed decisions. Because if this is not doen, learners will always struggle with the high order questions.

QUESTION 4

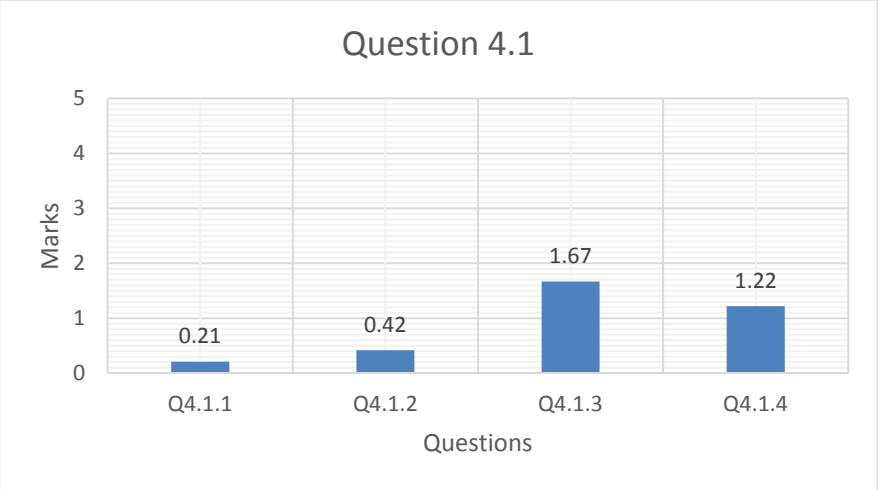
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question as a whole was not well answered by most of the learners. Question 4.1, learners could not make sense of the information that was given and therefore could not apply to answer the question. Question 4.2, learners struggled to interpret the layout plan and the map that was given. Question 4.3, the compound bar graph that was given with so much information was a great challenge for most learners.

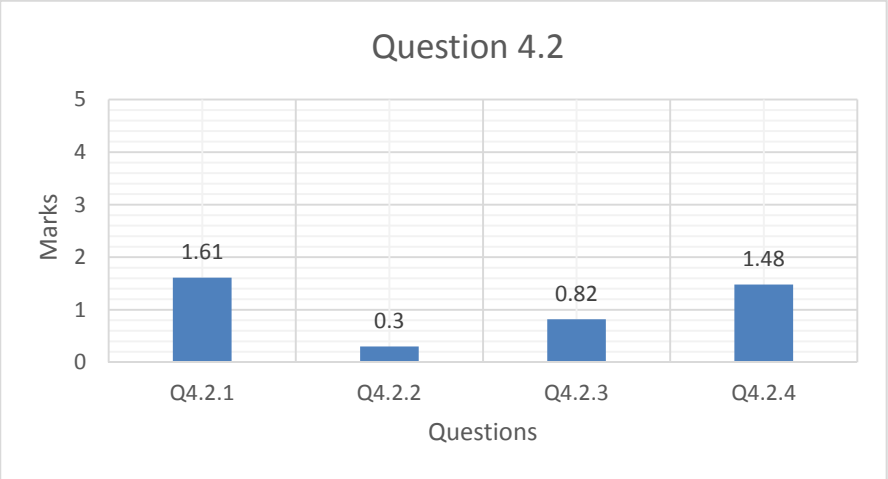
Average mark from the sample of 100 :		
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE % FROM SAMPLE**
4.1	Measurement and Maps, Plans & other Representation	39,1%
4.2	Maps, Plans & other Representation	18,9%
4.3	Data Handling	45,33

The following analysis from 100 scripts.

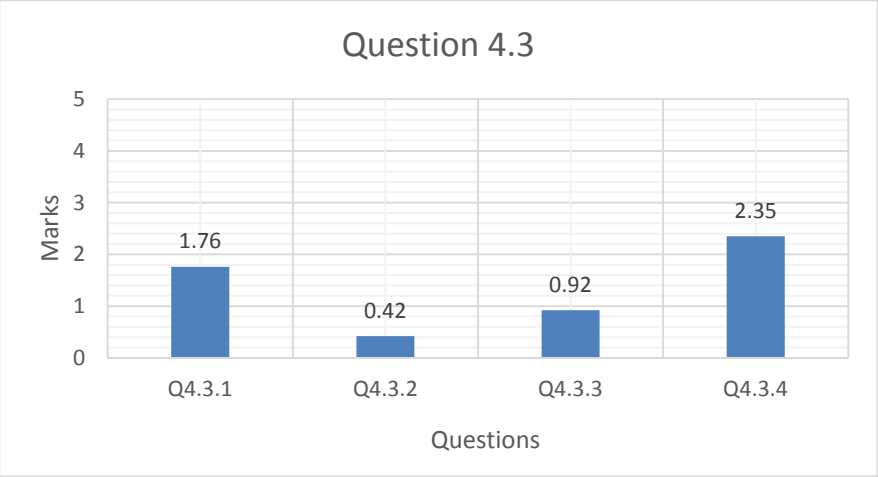
Question 4.1



Question 4.2



Question 4.3



From the 100 scripts the average mark for Question 4 was 13,26 (36,8%)

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.
4.1 4.1.1Learners could not see the pattern that of the conversion note, for example 26 referred to miles and 0, 21875 that equals 385 yards.
4.1.2 They were not able to read the values from the graph. Learners were also confused by the two graphs and could not use the correct for reading, because at certain point it seem like the

two graphs flow into one another.
4.1.3 Learners could easily read the correct height above sea level, but didn't know whether they have to multiply or divide.
4.1.4 Generally learners were able to interpret that the graph has a steep slope although it was given in their own broken language.
4.2 4.2.1 Learners could easily determine the number of venues.
4.2.2 Learners could not orientate the map as the North was indicated in another direction from what they are used to, therefore they could not get the correct answer.
4.2.3 Learners do not have a good understanding of estimation regarding space.
4.2.4 Learners have absolutely no idea how to work with scale problems. They could easily measure, although sometimes incorrectly, but could not apply the scale.
4.3 4.3.1 This question was extremely well answered.
4.3.2 This question was very poorly answered, because learners could not see that Monday was not on the graph and then gave any reason for why it cannot be said with certainty.
4.3.3 Learners only manage to deduct either the number of visitors for a certain hourly time (either increase or decrease) without comparing with another hourly time or number of visitors. They have no clue what so ever of the word "trend".
4.3.4 Learners could easily reflect on what is happening on a Tuesday versus a Saturday. Although most of them only gave one reason.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- Learners should be taught how to use a given conversion table and how to make sense of it.
- Teacher should provide learners with more complex graphs where different information can be compared in order to make sound decisions.
- Emphasis in graphs should be placed on how the gradient looks like (increasing or decreasing) and why.
- Teachers should teach learners how to estimate especially working with plans where no scale is given.
- Teachers to ensure that learners are able to work with bar scales.
- Learners to be given compound bar graphs not only for two things, therefore making it

more complex to make sound decision where they will be guided by the teachers.

(d) Describe any other specific observations relating to responses of learners

- Learners cannot read or interpret more complex graphs.
- Estimations is still challenging.
- Learners find it extremely difficult to work with maps and map scales.
- It seem like learners do not have a clue of what they have to do when asked to describe a trend.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Workshops to be conducted on different and more complex graphs.
- More workshops should be conducted on Maps and Plans and other Representations.
- These workshops must emphasize the different aspects such as orientation of maps to determine the correct direction, as well as how to work with a bar scale.
- Subject Advisors to instruct teachers to use more complex compound bar graphs and not only the easy ones, because Paper 2 requires a more in depth reasoning and reflection approach.