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NSC 2016 CHIEF MARKER'S REPORT

SUBJECT	MATHEMATICAL LITERACY

PAPER	1

DATE OF EXAMINATION:	OCT 2016	DURATION:	3HRS

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

General question paper overview:

- **Language:** The Language used is acceptable to learners especially those with English as home language, learners with English as first additional language had some difficulties in answering some questions especially questions that required explaining the terms.
- **CAPS compliance**:
- It complies with policy document, covering the topics:
- (Finance; CAPS policy stipulate 35±5% of the paper to be Finance. The paper is in line with 56% (54 Marks)
- Measurements; CAPS policy stipulate 20±5% of the paper to be Measurements. The paper is in line with 19.3% (29 marks).
- Maps, plans and other representations; CAPS policy stipulate 15±5% of the paper to be tis section. The paper is in line with 15,3% with 23 Marks.
- Data Handling: CAPS policy stipulate 25±5% of the paper to be Data Handling. The paper is in line with 24% (36 marks):
- Probability: CAPS policy stipulate minimum 5% of the paper to be Probability. The paper is in line with 5.3% (8 marks).
- Cognitive Levels appropriately spread. CAPS require Paper 1 to have Level 1: 60±5%; Level 2: 35±5% and Level 3: minimum 5%.The paper complies with Level 1: 56,3%; Level 2: 38% and Level 3: 5,3%
- **Technical Aspects:**
- Technical presentation, graphs, tables and drawings are clear.
- **Mark allocation and Time:**
- The 3 hours allocated was enough and mark allocation is appropriate.

General overview of Learner Performance in the question paper as a whole

Generally the paper was poorly done with an average of 41% pass overall. There were a few schools that had good results but the majority did very poorly and this resulted in the low average.

The average performance in the questions as per the sample of 100 scripts Randomly selected was as follows :

- Question1 that examined Finance learners obtained an average of 22 out of the total 43 marks.
- From the same sample the Question 2 that examined Measurement learners obtained an average of 11,42 out the total 29 marks.
- Question 3 examined Maps and representations and the average was 10.26 out of 28 marks.
- Question 4 examined Data handling allocating 30 marks and learners performed at an average of 13 out of the total 30 marks.
- Question 5 examined a combination of aspects but the context was mainly the exchange rates and learners performed at 40% in the question with an average of 8 marks of out of 20.

The sub questions where a high percentage of learners got no marks as per the sample of 100 scripts randomly selected for the Rasch model analysis are illustrated in the table 1 below:

. This is should be a concern to the interested parties.

Table 1:Questions where the candidates scored zero marks:

Question	Mark Obtained	Total per sub question	Percentage of learners in the sample.
1.1.2	0	2	74
1.1.5	0	2	72
1.1.6	0	3	79
1.1.9a	0	2	65
1.2.1	0	2	58
1.2.3 (b)	0	2	46
2.1.1 (b)	0	3	65
2.1.1 (d)	0	3	67
2.2.4	0	3	66
3.1.2	0	2	68
3.1.3	0	3	76
3.1.5	0	3	76
3.1.6	0	2	76
3.2.1 (b)	0	2	69
4.1.2	0	2	77
4.1.3	0	3	67

4.2.1	0	2	93
4.2.2	0	2	63
5.2	0	2	63
5.3.1	0	2	59
5.3.2	0	2	79
5.4	0	3	58

SECTION 2: Comment on candidates' performance in individual questions

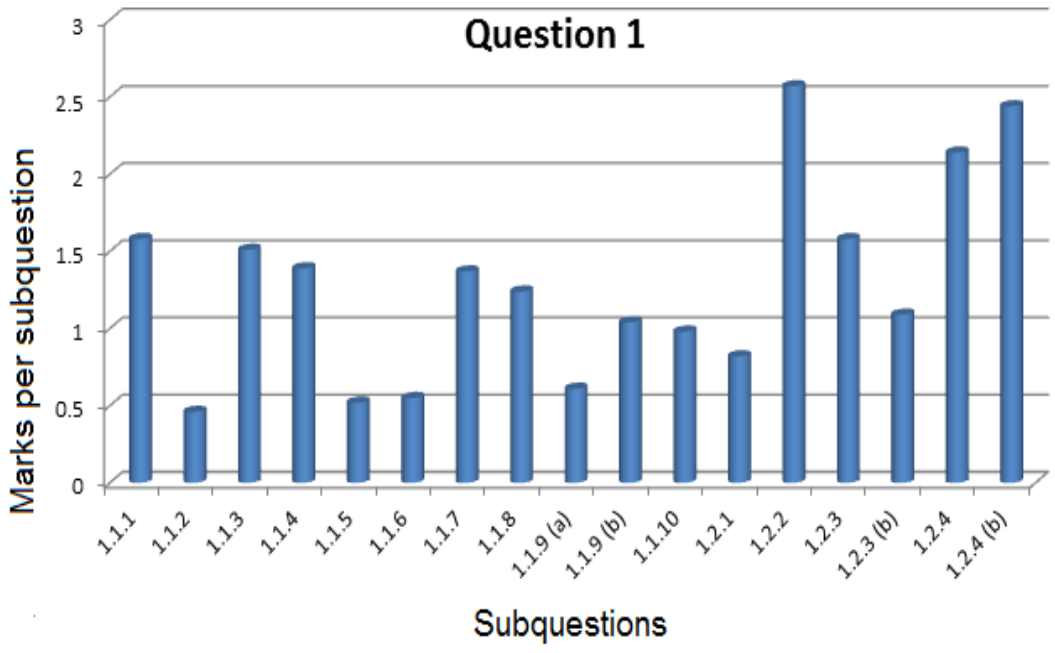
(It is expected that a comment will be provided for each question on a separate sheet).

QUESTION 1

- **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

This is a financial question based on home loan document and generally the candidates did best in it as clearly seen from the sample.

The graph below shows how the candidates performed in question 1 as from a sample of 100 Scripts randomly selected for the Rasch model analysis.



Average mark from the sample of 100 :	**21.89**	
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE FROM SAMPLE**
1.1.1	Question required naming the borrower	
1.1.2	Question required to determine the end period of the loan	
1.1.3	The question required to determine the difference between the insured value and registered value.	
1.1.4	Determining the administration fee for the loan period.	

1.1.5	This question was about interest rate and use of % increase.		
1.1.6	This demanded to determine the VAT amount when give the VAT inclusive value.		
1.1.7	This is a question that demanded to explain the concept of home loan.		
1.1.8	This was a question about interest changes with alternative solutions to choose from		
1.1.9(a)	It required determining the adjustment amount made by the bank.		
1.1.9(b)	Learners were unable to distinguish between the concept of credit and debit.		

1.1.1.0	Required to substitute in the formula to calculate interest.	
1.2.1	Knowledge of variable cost required.	
1.2.2	Use of formula to calculate cost	
1.2.3(a) and (b)	Determining the cheapest venue (use of fixed and variable costs)	
1.2.4	Question was about income and determining profit	

(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	Well answered as it required naming the borrower. A few surprisingly gave calculations instead of naming

	the borrower
1.1.2	Learners failed to determine the end date and gave 22March 2014 which is the loan statement date
1.1.3	Learner's failure to identify the correct values for subtraction. Some who managed to identify the values interchanged them. 466 000,00- 1185627,28 = R 719 627,28 (a positive value)!
1.1.4	Candidates managed to read from the table the monthly administration fee of R5,70 but they failed to multiply the administration fee by 20 years. An indication of inability to convert 20 years into months.
1.1.5	The percentage of 7.25% was the interest rate after the 0,5% increase. Most learners subtracted instead of adding. The memo required method with accuracy and no CA marks were awarded.
1.1.6	The poor response from the candidates in this VAT question set at level 2 appeared as if it was level 3. It required learners to determine the VAT amount when given the VAT inclusive value. It required one of the methods. Most learners just calculated 14% of the inclusive value.
1.1.7	The learner's responses were poor. One could sense that learners had an idea but could not express themselves adequately.
1.1.8	This was a question with alternative solutions to choose from Learners could not identify the differences in the alternatives given. Most gave A as the answer.
1.1.9(a)	This was one of the worst answered questions. It required learners to determine a bank correction. Learners had to use reverse calculations in order to calculate the response. However, most learners used any values from the balance column and even used values from the interest column giving a variety of incorrect responses.
1.1.9(b)	Learners were unable to distinguish between credit and debit. There is need to teach learners the financial documents and in familiar and unfamiliar contexts. A good number of learners gave debit as the answer
1.1.10	Learners were unable to substitute correct values. Some failed to substitute the value n=31 and used 30 or 28 days.!

1.2.1	Candidates unable to explain variable cost as one that varies. Most learners gave variable cost per person.
1.2.2	<u>Most commonly used answers (incorrect):</u> • 45 x 230 = R10 350 [forget to add fixed cost] • Use values from the other two venues (incorrect reading from the table) • Incorrect use of BODMAS in certain districts E.g. 6000 + 230 x 45 = 6230 x 45 = R280 350, 00
1.2.3	<u>Most common mistakes made:</u> • Candidates use calculations instead of reading the values from the graphs • Learners calculate the values for all three venues, making errors in the process • Candidates often didn't select the cheapest venue (a) when showing their calculations, or after doing calculations
1.2.4	A good number of learners failed to draw the income graph because they are to draw a graph given points in the table. They are not used to determine points without an equation.

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

Teachers to:

<u>Teaching and learning:</u>

- Teachers need to do similar examples, but in a variety of contexts
- Emphasize correct selecting and reading from table
- Teach basics (BODMAS) and don't just assume learners are familiar with all the concepts, such as substitution etc.
- Explain the use of formulae (seen and unseen)
- Learners must have a clear understanding of fixed and variable, as they mix up the two when substituting values.
- Show learners how to find or allocate relevant points on graphs (every assessment task must include a graph)
- Do graph analysis, emphasize looking at values (areas) above and below graph lines – what this means
- This particular section is dealt with mostly in grade 11 but should definitely be revised in Matric.
- Ask learners different types of line graphs to plot e.g.: solid line, dotted line etc.

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

Learners struggle to use accurately the calculators and do not check the accuracy of answers obtained. They do not follow instructions in some cases like when they are provided the value of π=3.142 but you still get learners using π from the calculators and they get penalised.

Learners experience great difficulty interpreting the questions in this context and hence are unable to respond appropriately.

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

There is need to develop common lesson plans, assessments tasks and memos at a cluster or at district level.

QUESTION 2

- **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**
  Results from the sample indicate fair performance in the question as reflected in the graph below (the graph showing the average marks in Sub-questions of question 2)

Average mark from the sample of 100 :		**Average mark 11.42 out of 29**
SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE FROM SAMPLE**

	2.1.1(a)	Measuring length and distance		
	2.1.1 (b)	Measuring length and distance(Perimeter)		
	2.1.1 (c)	Calculating area		
	2.1.1 (d)	Measuring length and distance		
	2.1.2	Conversions		
	2.2.1	Conversions; Substitute in formula and changing the subject of the formula to determine the unknown.		
	2.2.2	Substitute in formula and measuring area of a Cylinder		

	2.2.3	Volume of Cylinder – Proving the given solution		

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

Language posed a problem to many learners.
Learners still have a problem with basic Mathematical skills like:
Substituting into a given formula, determining the unknown(e.g. length, area, volume) value and Conversions.
No understanding of metric units of Measurement for distance, capacity/volume of mass.
Learners lack basic calculator skills.

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

- Basic concepts must be drilled and emphasised:
  (1) Measuring length and distance
  (2) Measuring length and distance(Perimeter)
  (3) Calculating area and volume
  (4) Conversions
  (5) Substitute in formula and changing the subject of the formula
- Formal and Informal Assessment(Class Tests, Class Work and Homework) must form an integral part of Teaching and Learning
- Content must be accompanied by PRACTICAL EXAMPLES.
- SMT's must take initiative (fundraising) make sure that each learner has got a Scientific Calculator and then basic calculator skills must be developed.
- The relevant Policy Documents (E.g. CAPS Document) must be used for Teaching and Learning purposes.

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

With reference to 2.1.1(b) – Learners may calculate 2.1.1(d) as $\frac{1}{3}\times$ of 2.1.1(b).
Learners use the calculator value for instead of substituting = 3.142.

Radius (r=7) in 2.2.3 learners substituted for in the given formula for r=7 got 14 instead of 49!!

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

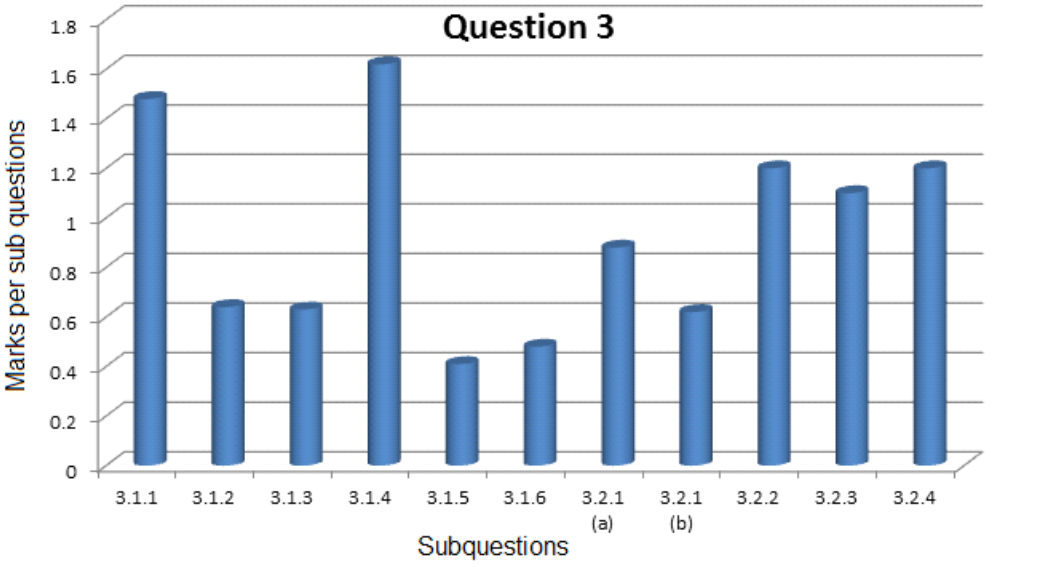
- Memo discussions and Workshops aimed at Marking Procedures must be done by the District Offices and Subject Advisors to equip/empower those who do not do external marking.
- Contextual factors caused learners to not be familiar with what a T-shaped runway platform is.
- Learners do not know how to round off according to the given context.

Learners still do not apply the BODMAS rule when doing calculations

QUESTION 3

- **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

This question was poorly answered with an average of 10.26 out 28 marks which translates to 36.7% as from the sample. The graph below shows the performance of the learners in the sub –questions of question 3.



QUESTION 3										
3.1							3.2			
3.1.1	3.1.2	3.1.3	3.1.4	3.1.5	3.1.6	3.2.1 (a)	3.2.1 (b)	3.2.2	3.2.3	3.2.4
						(a)	(b)			
3	2	3	4	3	2	2	2	2	2	3

Average mark from the sample of 100 :	**Average of 10.26 out of 28**

SUB-QUESTION	**TOPIC OR ASPECT TESTED**	**AVERAGE FROM SAMPLE**
3.1.1	It was a simple case of counting seats. Determining seats in arena (seating plans)	

3.1.2	Use of compass directions	
3.1.3	Determining positions.	
3.1.4	Use of compass and other directions explain the routes.	
3.1.5 and 3.1.6	Probability concept is examined in these two sub questions	
3.2.1-3.2.3	Dealing with assembling items given in instructions.	
3.2.4	Use of the scale to determine the actual length.	

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

3.1.1 It was a simple case of counting seats that at times got wrong due to :

- The learners physically counted seats and came up with incorrect values
- Counted blocks to come out with answer

Learners counted number of seats in a row and multiplied by number of rows.

3.1.2 This was poorly answered due to poor understanding of the compass directions.

3.1.3 Poorly answered due to learners' inability to break or sort the information given in the description into the salient points.

3.1.4 Learners were required to direct you towards the correct refreshment stand.

- Many learners directed to entrance 2
- Learners could not express themselves adequately to direct to the refreshment 1
- Moat could not take into where the North was pointing.

3.1.5 Learners were required to express percentage values as a probability.

- Language barrier came into effect as they cannot express themselves adequately.
- Lack of content knowledge of probability provides a problem as learners do not understand the probability scale
- Learners simply multiplied 87,5 by 100
- Calculated the 378 and failed to continue
- Learners gave as a percentage
- They expressed answer as

3.1.6 Learners required to choose the smallest % from given list:

Some learners choose 0,8 thinking that it was the smallest value.

3.2.1 (a), and (b) were answered well.

3.2.2 This question requires the learners to consult the key for keywords of the lampshade and screws and then use diagram 7 for details of attachment and diagrams 5/6 for an overall picture.

Learners could not identify the screws and thus gave an incorrect response.

3.2.3 Fairly answered sub question.

3.2.4 Learners struggled to use the scale. Instead of multiplying by the scale 30 some learners divided by the scale and wrong.

Not knowing basic conversion factors

Not knowing whether or not to x or ÷ by the conversion factor

In converting 62mm to m some gave the answer of 0,62m instead of 0.062m even though they had indicated a factor of 1000

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

- Teachers must teach learners various methods they can use to approach to unravel such descriptions. A logical approach step by step to solve these questions is a skill that needs

to be imparted to learners.

- Teachers to gather a variety of "Assembly Instructions" as exercises to do in class Two or three sets of instructions can be covered in a single lesson
- "Determine" This demands the teachers to teach the learners the key words and terminology used in Mathematical Literacy
- Lots of exercises, outside of any context should be practised to drill a basic routine

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

3.1.1. Learners made mistakes when counting seats.
3.1.2 Learners struggled to determine direction from a given position to another position. our
3.1.3 Language could have been a factor. Learners did not understand the information given.

3.1.4 The concept of describing direction for the route confused the learners as it was a combination direction and route

Learners do not know the probability scale and could not select the probability for most unlikely to rain. Most of the incorrect answers given were 0.0 and 40%.

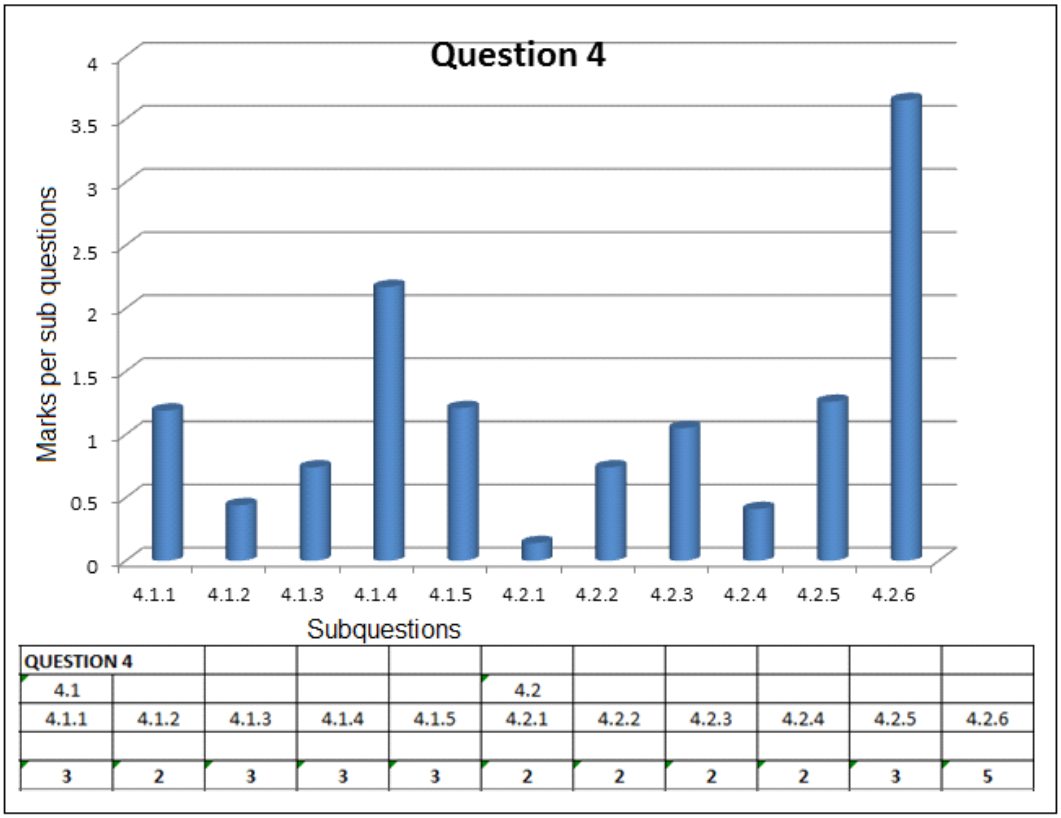
In 3.2.1 Learners gave Unscrewed as their answer as it appeared in question as one of the choices but the memo give loosen as the answer. Memo should be revised to allow this response as correct.

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

The teaching of Mathematical Literacy should be more practical and based on familiar and unfamiliar contexts. Terms used in class must be explained to learners and not assume to be known

QUESTION 4

- **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**
  The performance in this question was also poor with an average of mark of 13 out 30 which translates to 43.3% as per the sample of 100scripts randomly selected.
  The graph below shows the performance in the sub-questions. The response was best in 4.2.6 and 4.1.4



QUESTION 4										
4.1					4.2					
4.1.1	4.1.2	4.1.3	4.1.4	4.1.5	4.2.1	4.2.2	4.2.3	4.2.4	4.2.5	4.2.6
3	2	3	3	3	2	2	2	2	3	5

Average mark from the sample of 100 :	**13 out 30**

SUB-QUESTION	TOPIC OR ASPECT TESTED	AVERAGE FROM SAMPLE

	4.1.1	Reading from a Table and determine the difference		
	4.1.2	Reading from a Table		
	4.1.3	Reading from a Table and Interpret the answer		
	4.1.4	Reading from a Table and Interpret Answer		
	4.1.5	Integrating Data Handling with calculating a Probability		

	4.2.1	Show an understanding of the concept : “discrete data”		
	4.2.2	Reading from a Table		
	4.2.3	Reading from a Table		
	4.2.4	Reading from a Table and determine the sum thereof		
	4.2.5	Reading from a Table and calculate the percentage		

	4.2.6	Drawing a Broken Line Graph		

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- Learners are not comfortable reading from a table and analyzing/interpreting the data
- Learners are struggling with the concept "discrete data".

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

- Teachers need to work with definitions more ***practically (demonstrations)*** in order for learners to understand fully.
- Teaching and Learning should take place in the Lot of the learner for conceptual understanding to occur.
- Due to the language barrier learners could not express themselves correctly
- Content must be accompanied by **PRACTICAL EXAMPLES**.
- Teachers need to develop problem solving skills or techniques through regular and continuous assessment.
- Learners must be exposed to scenarios (unfamiliar contexts) using multimedia resources (e.g. television, DVD etc.)

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

Some learners understand the meaning of the definition of "discrete data", but lack the ability to apply it to the given context.

For learners in the rural area, the term "land-speed" must have been difficult to comprehend since it is not a familiar context for them

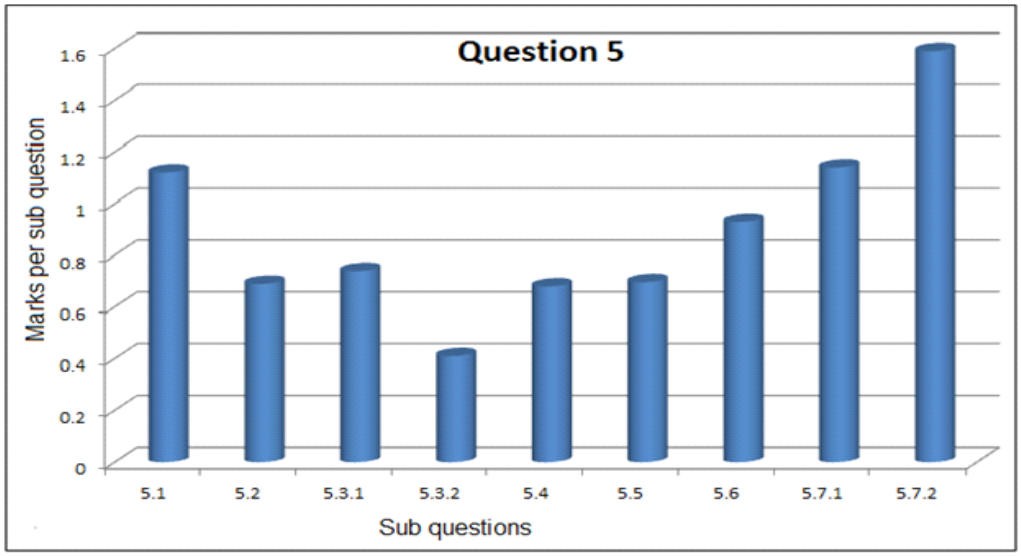
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Subject Advisors should monitor closely the standard of SBA.
- Teach, using familiar and unfamiliar contexts (see before mentioned suggestion).
- Teaching unfamiliar contexts will require from educators to develop teaching and learning material...

QUESTION 5

- **General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?**

The sample used for this report indicate that the question was also done at the same level with an average of 8 out 20 marks giving 40% pass in the question. The actual marking show there is a good number of learners that did not attempt or performed very poorly in the question.
The graph below show the result of the sample in the sub –questions of question 5.



QUESTION 5								
5.1	5.2	5.3		5.4	5.5	5.6	5.7	
5.1	5.2	5.3.1	5.3.2	5.4	5.5	5.6	5.7.1	5.7.2
2	2	2	2	3	2	2	2	3

Average mark from the sample of 100 :	**8out of 20 marks**

SUB-QUESTION	TOPIC OR ASPECT TESTED	AVERAGE FROM SAMPLE

	5.1.	Exchange rates and determining a stronger currency		
	5.2	Using the exchange rate to determine the price		
	5.3.1 &5.3.2	Reading values from the table and application of the exchange rate to determine the unknown values		
	5..4.	Concept of ratio.		
	5.5	Comparison of exchange rates.		
	5.6	Concept of median		

	5.7.1.	Data handling: arranging data in order in this case required descending order a		
	5.7.2	Calculating the mean.		

• **Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.**
5.1 Candidates asked to identify the strongest currency when two are compared, e.g. the strongest when compared to the rand Some can't read or understand the question: instead of writing a country they just write the currency
5.2 Using an exchange rate to calculate the price in Rands. Candidates multiplied by the exchange rate (0,07) instead of dividing by 0,07 R1 = 0,070$ They have to read the price of 2ℓ Cola in the United States of America from the table before converting it to Rands. They need to be encouraged to read out information from the tables.
5.3 .1 Same as 5.2, learners were asked to calculate the price of Big Mac Burger in Euros if it is R113.96 in South Africa given the exchange rate again,. Learners were multiplying by the conversion factor instead of dividing.
5.3.2 Same concept as in 5.3.1 (Calculating the exchange rate for an Indian Rupee versus the Rand. Given the two prices for the same item.) Learners made same error as mentioned in 5.3.1
5.4 learners are struggling with ratios most gave the answer in the unit ratio and not simplified ratio.
5.5 Identifying countries with almost similar purchasing power = Candidates were unable to identify which column from the table will be used to compare the purchasing power of these countries.
5.6 Median = candidates confused it with other measures of central tendency while most of them knew it as only a middle value without stating that the data must be arranged in ascending or descending order
5.7.1 Arrange in descending order = Most learners confused descending with ascending order

while others read the values incorrectly omitting some values when arranging

5.7.2 Mean is also confused with median by some learners. They add all values but instead of dividing by 11 they divide by two. There were cases where 11 were made numerator and the total the denominator: (=0.0117 as the mean)!
Others could not read the correct values from the table (for Big Mac Burger) in Rands, so they calculate mean from wrong values.

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

Learners should be drilled on time management in exams, the order of answering questions is not important. To be trained to start with the questions they are able to answer irrespective of order. There were many candidates that did not attempt question 5 may be because of time.

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

Exchange rates still a problem to many and the strength of currency appeared to be new to many.

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

Use of CAPS document should be emphasised when teaching and one has to be involved in teaching using various contexts.
Data handling as topic should be emphasized in the teaching using many different contexts both familiar and unfamiliar. (Use of all kinds of resources like magazines, newspapers, news and data from school, community, Municipality and the country etc.)

QUESTION 6 (NOT APPLICABLE)

(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

(b) Why was the question poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

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

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

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