LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF
EDUCATION

NATIONAL SENIOR CERTIFICAET

GRADE 12

MATHEMATICAL LITERACY P1

SEPTEMBER 2023

MARKS: 150

TIME: 3 HOURS

EMLITP1

This question paper consists of 12 pages, an ANSWER SHEET and a 6-paged addendum.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURES and ANSWER SHEET in the ADDENDUM to answer the following questions:
   - ANNEXURE A for QUESTION 1.2
   - ANNEXURE B for QUESTION 2.1
   - ANNEXURE C for QUESTION 3.1
   - ANNEXURE D for QUESTION 4.3
   - ANSWER SHEET FOR QUESTION 4.2.3
   - ANNEXURE E for QUESTION 5.3
3. Number the questions correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.
6. Show ALL calculations clearly.
7. Round ALL the final answers appropriately according to the context, unless stated otherwise.
8. Indicate units of measurement, where applicable.
9. Diagrams are NOT necessary drawn to scale, unless stated otherwise.
10. Write neatly and legibly.

QUESTION 1

1.1 A variety of levies, taxes and margins are added when calculating the pump price the consumer pays for fuel in South Africa.

TABLE 1 below shows the breakdown of these levies, taxes and margins for December 2022.

TABLE 1: THE BREAKDOWN OF LEVIES, TAXES AND MARGINS FOR DECEMBER 2022.

COST	95 ULP PETROL/ℓ	0,05% DIESEL/ℓ	0,005% DIESEL/ℓ
General fuel levy	R3,94	R3,80	R3,79
Road accident fund levy	R2,18	R2,18	R2,18
Wholesale, Retail margins, Distribution costs	R4,12	R1,97	R1,94
Slate levy	83,28 cents	83,28 cents	83,28
Basic fuel price	R12,34	R15,08	R15,49
TOTAL PUMP PRICE	----------	R23,86	R24,23

[Adapted from businessinsider.co.za]

Use TABLE 1 above to answer the questions that follow.

1.1.1 Identify the type of fuel with highest Basic fuel price. (2)

1.1.2 Calculate the difference (per litre) in Wholesale, Retail margins and Distribution costs 95 ULP petrol and 0,05% Diesel. (3)

1.1.3 Write down the Slate levy in rand per litre, rounded off to the nearest R0,05. (2)

1.1.4 Determine the total pump price of 95ULP petrol per litre in December 2022. (2)

1.1.5 Calculate the amount paid for General fuel levy and Road accident fund levy on 0,05% Diesel. (2)

1.2 The graph on ANNEXURE A shows the summer and winter average day temperatures in degrees Celsius for some of the towns and cities in South Africa.

[Adapted from www.south –africa-tours-and-travels.com]

Use ANNEXURE A and the information above to answer the questions that follow.

1.2.1 Identify the type of graph shown above in the given set of data. (2)

1.2.2 Name the town that recorded an average winter temperature of less than 15°C. (2)

1.2.3 Write down the town that has lowest increase in average day temperature from winter to summer. (2)

1.2.4 Write down the number of towns that recorded an average summer temperature of more than 30°C. (2)

1.2.5 Identify the town that recorded the highest average winter temperature. (2)

1.3 Nelly wants to enrol her daughter in a boarding school in 2024.

To have an idea of how much fees are charged in boarding schools, she compares fees from 10 most expensive boarding schools in South Africa, as shown TABLE 2 below.

TABLE 2: 10 MOST EXPENSIVE BOARDING SCHOOLS IN SOUTH AFRICA

Ranking in 2023	Name of school	Ranking in 2022	Amount of School fees		Increase (Rand)
			2022	2023	
1	Hilton College	1	R 343 155	R 369 920	R 26 765
2	Michael house	2	R 328 000	**A**	R 14 000
3	St Andrew's College	3	R 320 064	R 340 869	R 20 805
4	Roedean School	4	R 310 994	R 337 428	R 26 434
5	St John's College	5	R 304 995	R 331 091	R 26 096
6	Kearsney College	6	R 303 710	R326 480	R 22 770
7	St Mary's School	7	R 293 050	R 313 990	R 20 940
8	Bishops Diocesan College	8	R 289 700	R 311 960	R 22 260
9	St Alban's College	10	R 287 850	R 307 350	R19 500
10	Diocesan School for Girls	12	R 276 930	R 299 100	R 22 170

[Adapted from www.briefly.co.za]

Use TABLE 2 above to answer the questions that follow.

1.3.1 Arrange the increase amounts in ascending order. (2)

1.3.2 Determine the missing value **A**, the amount of school fees payable at Michael house in 2023. (2)

1.3.3 Identify the school with the third lowest amount of school fees payable in 2023. (2)

1.3.4 Write down the boarding fee of St Mary's School to Michael House in 2022 as a simplified ratio. (3)
[30]

QUESTION 2

2.1 Tsheola, a small-scale farmer, recently bought a new car.
A summary of his statement of account is shown on ANNEXURE B.

[Adapted from HomeNcar@standardbank.co.za]

Use ANNEXURE B to answer the questions that follow.

2.1.1 Write down the agreement number of Tsheola's account. (2)

2.1.2 Calculate the VAT amount included in the monthly service fee. (3)

2.1.3 Calculate the missing value **B**, the total monthly payment. (2)

2.1.4 Determine the instalment amount as a percentage of the purchase price. (3)

2.1.5 Calculate the total amount that Tsheola will pay after 6 years. (4)

2.2 Tsheola has an investment to the total value of R200 000 which will mature after 2½ years.

[Adapted from www.investor.gov]

Use ANNEXURE B and the information above to answer the questions that follow.

2.2.1 Tsheola stated that if he reinvests the amount for a further 2½ years, at an interest rate of 7, 8% compounded annually, he will have enough money for the balloon payment.
Verify, showing ALL calculations, whether his statement is valid. (8)

2.2.2 Give ONE possible reason why buying a car on a balloon payment is NOT a better option. (2)

2.3 The average price of a brown loaf of bread (700g) in South Africa is R18, 99 in 2023.
The inflation rate for 2022 was 6,9% and in 2021 it was 4, 5%.

[Adapted from www.statssa.gov.za]

Use the information above to answer the questions that follow.

2.3.1 Define the term *inflation* in the given context. (2)

2.3.2 Tsheola stated that the price of a loaf of bread in 2021 was less than R13, 99.
Verify, showing ALL calculations, whether his statement is valid. (6)
[32]

QUESTION 3

3.1 In South Africa, tourism is recognised as an important sector for economic growth and development. ANNEXURE C shows the number of tourists who visited South Africa by month and year of travel, 2017, 2018 and 2019.

[Adapted from www.statssa.gov.za]

Use ANNEXURE C to answer the questions that follow.

3.1.1 Identify the month in which South Africa had the highest number of tourists in all the 3 years. (2)

3.1.2 Write down the number of tourists who visited South Africa in December 2018 in words. (2)

3.1.3 Determine the probability, as a decimal, of randomly selecting a month in which the number of tourists is more than 900 000 in 2017. (3)

3.1.4 Calculate the mean number of tourists who visited South Africa in 2019. (4)

3.1.5 Describe the trend in the number of tourists visiting South Africa from March 2018 to June 2018. (2)

3.2 Jerry, one of the visitors who visited South Africa in 2019 is considering taking his family on vacation to Robberg Nature Reserve in the Western Cape Province.

He obtained the information in TABLE 3 about the level of crime in the Province on the internet.

TABLE 3: QUARTER TWO CRIME STATISTICS IN THE WESTERN CAPE FROM 2020 TO 2022.

Crime category	July to Sept 2020	July to Sept 2021	July to Sept 2022	% Change
Murder	1 013	1 011	1 050	3,9
Sexual offences	1 664	1 468	1 815	23,6
Common Robbery	1 925	1 965	2 501	27,3
Carjacking	838	697	966	.....
Arson	174	153	201	31.4
Burglary	7 247	6 291	7 078	12,5
Theft from motor vehicles	6 365	.....	6 467	20,8
Commercial crime	3 443	4 249	5 661	33,2

[Adapted from saps.gov.za]

Use TABLE 3 above to answer the questions that follow.

3.2.1 Determine the value of Quartile 2, for the number of crimes committed in 2020. (3)

3.2.2 If the number of cases for theft from vehicles increased by 20,8% in 2022. Calculate to the nearest hundred, the number of cases from motor vehicles in 2021. (4)

3.2.3 Calculate the percentage change in the number of Carjacking between 2021 and 2022.

You may use the following formula:

$$\%\text{Increase} = \frac{\text{Number of Carjacking in 2022} - \text{Number of Carjacking in 2021}}{\text{Number of Carjacking in 2021}} \times 100\%$$ (3)

3.2.4 State, giving a reason, whether the data given in the % change column, is discrete or continuous data. (2)

[25]

QUESTION 4

4.1 Leon aged 75, earned an annual income of R1 225 000 for the financial year ending on 28 February 2023.

- He contributed 7,5% of his annual income towards Pension fund.
- He donated R100 000 to his neighbouring school.

TABLE 4 below shows tax table for the 2022/2023 tax year.

TABLE 4: INCOME TAX RATES FOR THE 2022/2023 TAX YEAR.

Taxable Income(R)	Rates of tax (R)
1 - 226 000	18% of taxable income
226 001 – 353 100	40 680 + 26% of taxable income above 226 000
353 001 – 488 700	73 726 + 31% of taxable income above 353 100
488 701 – 641 400	115 762 + 36% of taxable income above 488 700
641 401 – 817 600	170 734 + 39% of taxable income above 641 400
817 601 – 1 731 600	239 452 + 41% of taxable income above 817 600
1 731 601 and above	614 192 + 45% of taxable income above 1 731 600

REBATES (2022/2023)	
Primary	16 425
Secondary (65 and older)	9 000
Tertiary (75 and older)	2 997

[Adapted from www.SARS.gov.za]

Use TABLE 4 and the information above to answer the questions that follow.

4.1.1 Determine the amount Leon contributes towards pension fund. (2)

4.1.2 Calculate Leon's taxable income. (2)

4.1.3 Calculate the amount of annual tax Leon must pay for 2022/2023 tax year. (8)

4.2 Leon's niece, Betty sells lunch packs for extra money. It costs her R55 to make one lunch pack.

TABLE 5 shows the Cost Price and Income received from 60 lunch packs.

TABLE 5: COST AND INCOME RECEIVED FROM 60 LUNCH PACKS

Number of lunch packs	0	10	20	30	45	60
Cost price in rand (R)	300	850	1 400	1 950	2 775	3 600
Income in rand (R)	0	700	1 400	2 100	3 150	4 200

[Adapted from www.mylunchbuddy.co.za]

Use TABLE 5 above to answer the questions that follow.

4.2.1 Determine the selling price of one lunch pack. (2)

4.2.2 Write down the equation that can be used to calculate the cost of the lunch packs. (2)

4.2.3 The graph on the ANSWER SHEET shows the total income received from selling 100 lunch packs.

Use TABLE 5 to draw on the same answer sheet another graph representing the cost for making the lunch packs (3)

4.2.4 Calculate the amount of profit Betty will make from the sale of 100 lunch packs if the income received is R7 000. (5)

4.3 Betty will include a soda in the lunch packs. To help her decide which sodas she must put in the lunch packs she studied the available data for three most popular drinks sold in her neighbourhood.

The box and whisker plots in ANNEXURE D show the number of drinks sold on a particular Monday.

[Adapted from www.tasteatlas.com]

Use the box and whisker plots in ANNEXURE D to answer the questions that follow.

4.3.1 Write down the 75^{th} percentile of Orange juice drink. (2)

4.3.2 Calculate the interquartile range of the Cola drink. (4)

[30]

QUESTION 5

5.1 Taryn who stays in Cape Town is considering relocating to Johannesburg. In order to understand the financial implications of relocating, she compares the electricity tariffs for the two cities as shown in TABLE 6 below.

TABLE 6: ELECTRICITY TARIFFS FOR CAPE TOWN AND JOHANNESBURG.

CAPE TOWN: ELECTRICITY TARIFFS-HOME USER (VAT excl.)		
Block 1	0 – 600 kWh	R 2,29 / kWh
Block 2	> 600 kWh	R 3,15 / kWh
Monthly service charge		R 185,00
JOHANNESBURG: ELECTRICITY TARIFFS-RESIDENTIAL (VAT incl.)		
Block 1	0 – 500 kWh	R 2,02 / kWh
Block 2	500 – 1000 kWh	R 2,31 / kWh
Block 3	1000 – 2000 kWh	R 2,49 / kWh
Block 4	2000 – 3000 kWh	R 2,62 / kWh
Block 5	> 3000 kWh	R 2,75 / kWh
Monthly service charge		R 209,23
Monthly capacity charge		R 616,37

[Adapted from www.capetown.gov.za and www.joburg.org.za]

Use TABLE 6 and the information above to answer questions that follow.

5.1.1 Write down the monthly capacity charge of Johannesburg to the nearest ten rand. (2)

5.1.2 Taryn uses on average 850 kwh of electricity per month.
Determine the difference in the cost of electricity between the two cities if the cost including VAT for Cape Town is R2 698,48. (6)

5.1.3 Taryn claimed that if she does not use any electricity for a month she will only pay R212,75 in monthly service charges including VAT in Cape Town.

Verify, showing ALL calculations, whether her statement is valid. (4)

5.1.4 Explain how the monthly service and monthly capacity charges affect the residents. (2)

5.2 Taryn bought a dress for £60 and a coat for 1500 MZM.

MZM = Mozambican Metical
ZAR = South African Rand

TABLE 7: EXCHANGE RATES AS OF 22 APRIL 2023

1£ = 22,489624 ZAR	1 MZM = 0,282437 ZAR
1 ZAR = 0,0444648 £	1 ZAR = 3,54338 MZM

[Adapted from www.xe.com]

Use TABLE 7 and the information above to answer question that follow.

5.2.1 Define the term *exchange rate* in the given context. (2)

5.2.2 Calculate the total amount, rounded to the nearest rand (ZAR), that Taryn spent for the dress and the coat. (6)

5.3 The pie charts below show the population of India and South Africa affected by the quality of drinking water. The population of South Africa was 59,39 million people.

[Adapted from www.nytimes.com]

Use ANNEXURE E and answer the questions that follow.

5.3.1 Calculate the total number of people with Poor drinking water quality in South Africa. (3)

5.3.2 Calculate the probability, as a percentage, of choosing a person with Bad drinking water quality in India. (5)

5.3.3 Calculate the difference of the number of people in the excellent category affected by the quality of drinking water in the countries. (3)

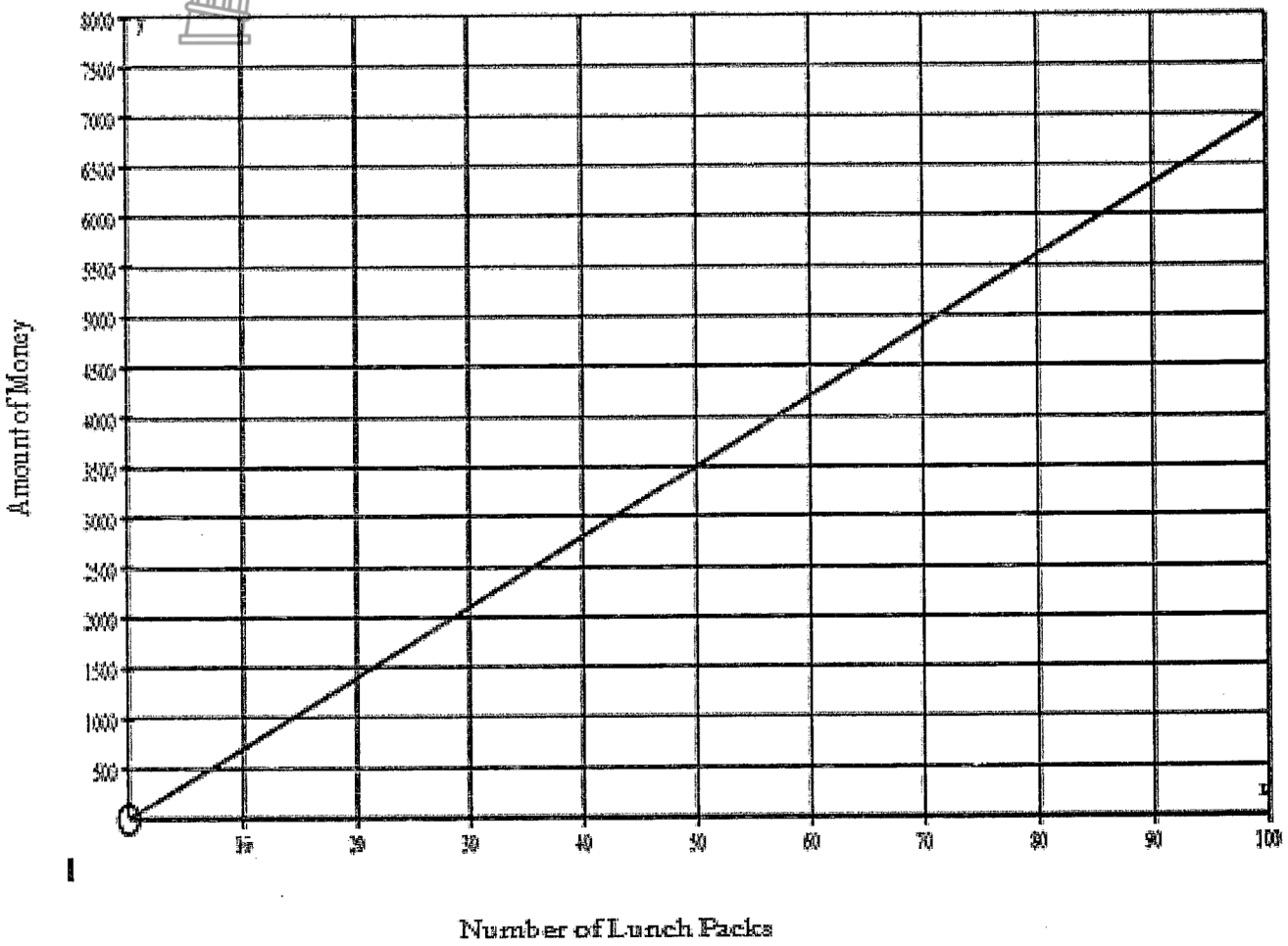
[33]

TOTAL MARKS: 150

ANSWER SHEET

NAME OF THE CANDIDATE: .....

QUESTION 4.2.3



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MATHEMATICAL LITERACY P1

SEPTEMBER 2023

ADDENDUM

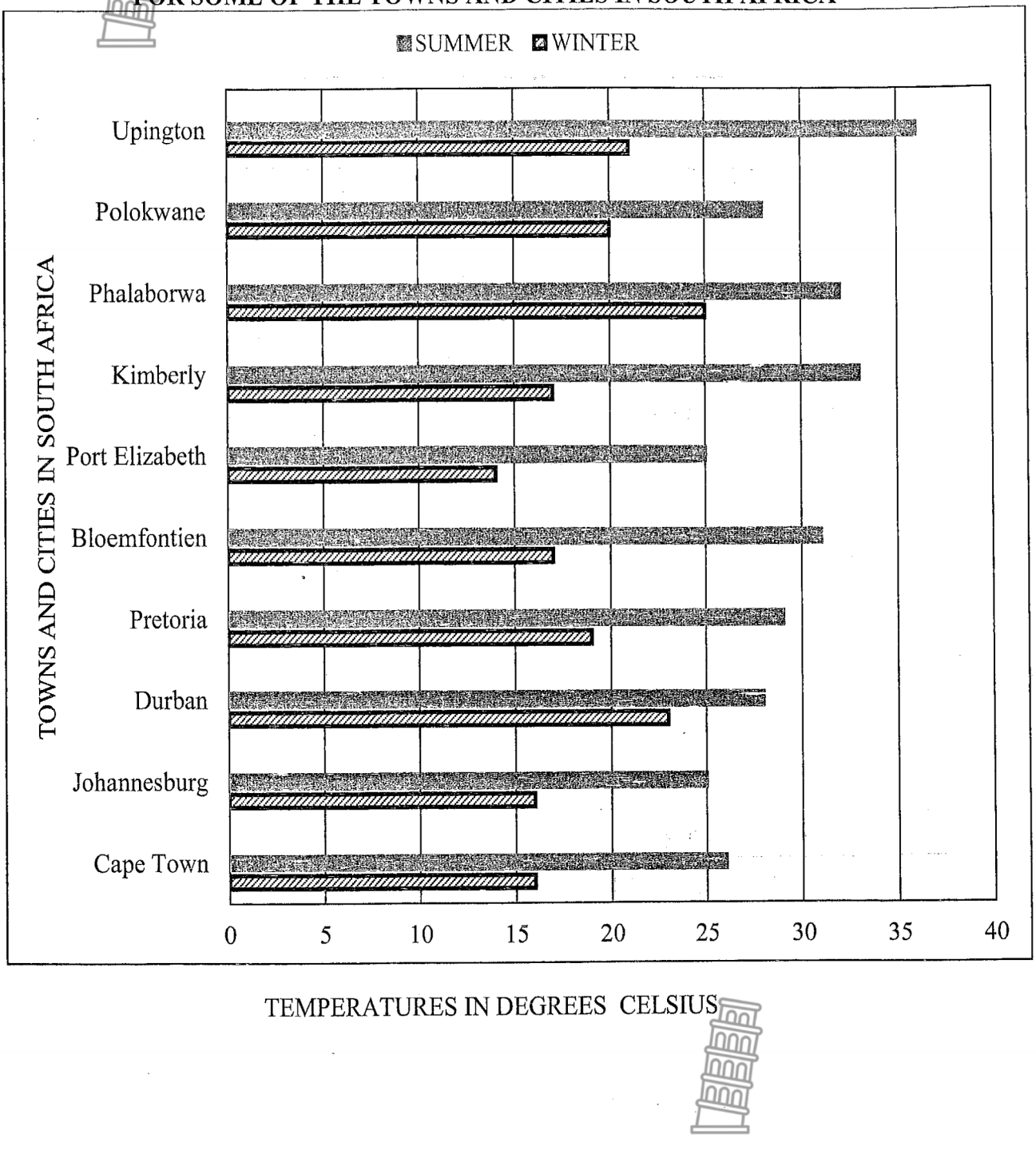
EMLITP1AD

This ADDENDUM consists of 6 pages with 5 ANNEXURES.

ANNEXURE A

QUESTION 1.2

THE SUMMER AND WINTER AVERAGE DAY TEMPERATURES IN DEGREES CELSIUS FOR SOME OF THE TOWNS AND CITIES IN SOUTH AFRICA



ANNEXURE B

QUESTION 2

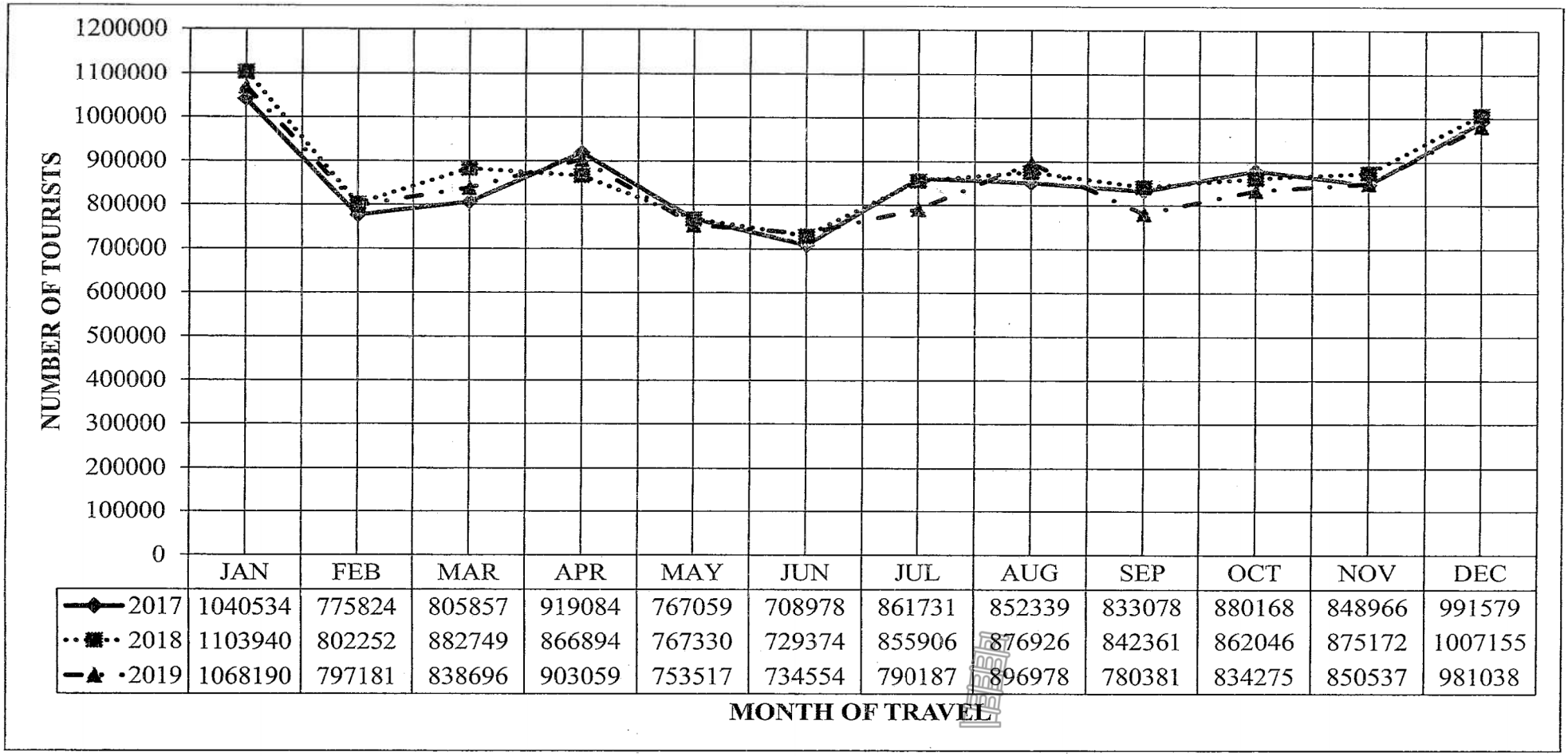
SUMMARY OF TSHEOLA'S STATEMENT OF ACCOUNT

STATEMENT OF ACCOUNT	
	ABC BANK
	P.O.BOX 8296
	JOHANNESBURG
TO: Mr. TS Tsheola	
1341 Glen Norton Road	
BENONI ;1401	Statement period:01/02/2023 – 28/02/2023
	Agreement Number: 00020117934
TRANSACTION DETAILS	
Purchase Price	R 781 790,48
PAYMENT INFORMATION	
Instalment	R 15 226,95
Monthly service fee	*R 69,00
Total monthly payment	**B**
ACCOUNT SUMMARY	
Contract period	6 years
Payment frequency	Monthly
Customer Rate	17,34%
Balloon / Residual	R 283 560,10
NOTE: This item is inclusive of 15% VAT.	
Balloon payment is a lump sum payment made at the end as your final instalment.	
Balloon payment serves as instalment number 72	

ANNEXURE C

QUESTION 3

THE NUMBER OF TOURISTS WHO VISITED SOUTH AFRICA BY MONTH AND YEAR OF TRAVEL: 2017, 2018 AND 2019.

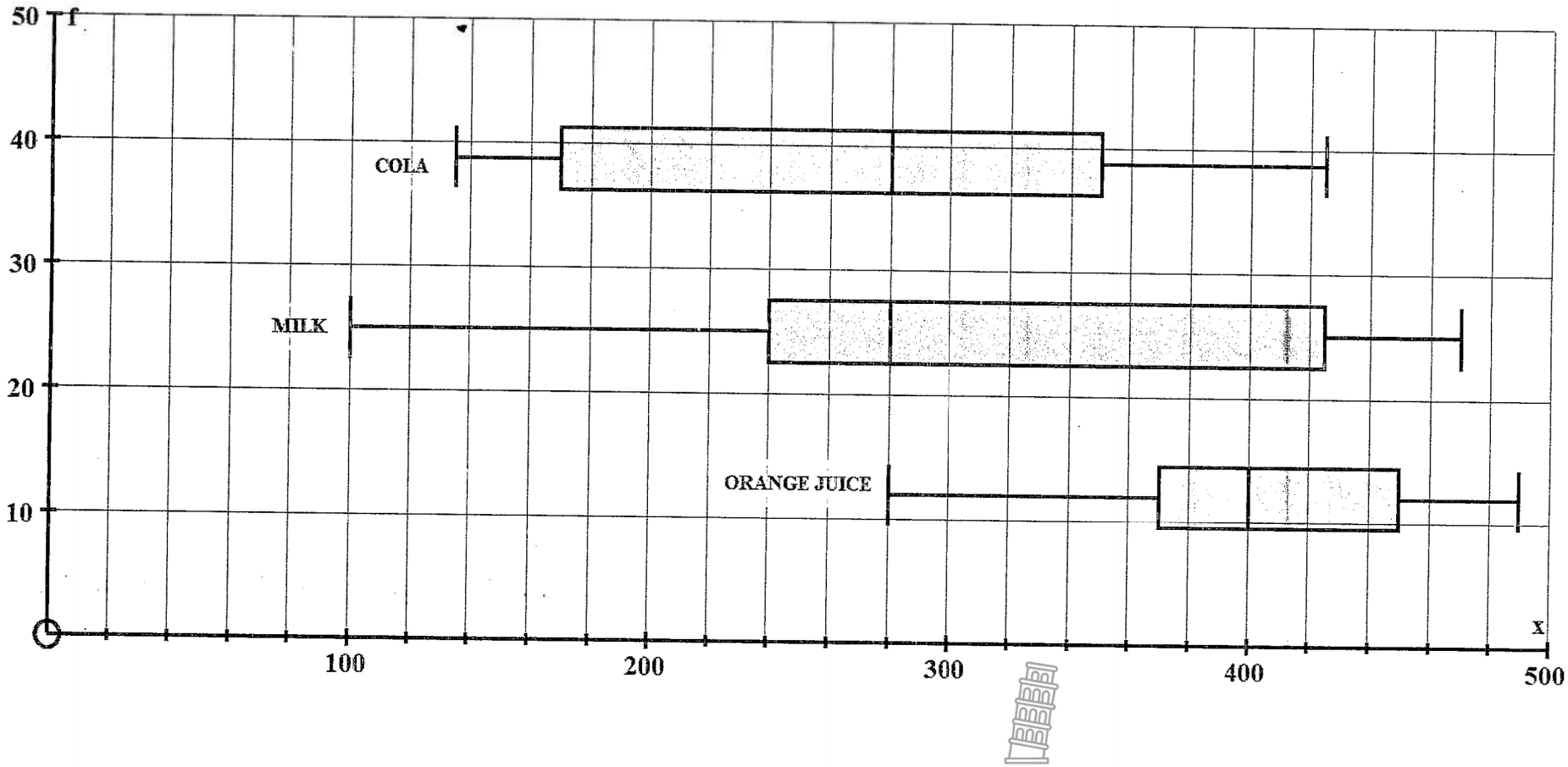


	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2017	1040534	775824	805857	919084	767059	708978	861731	852339	833078	880168	848966	991579
2018	1103940	802252	882749	866894	767330	729374	855906	876926	842361	862046	875172	1007155
2019	1068190	797181	838696	903059	753517	734554	790187	896978	780381	834275	850537	981038

ANNEXURE D

QUESTION 4.3

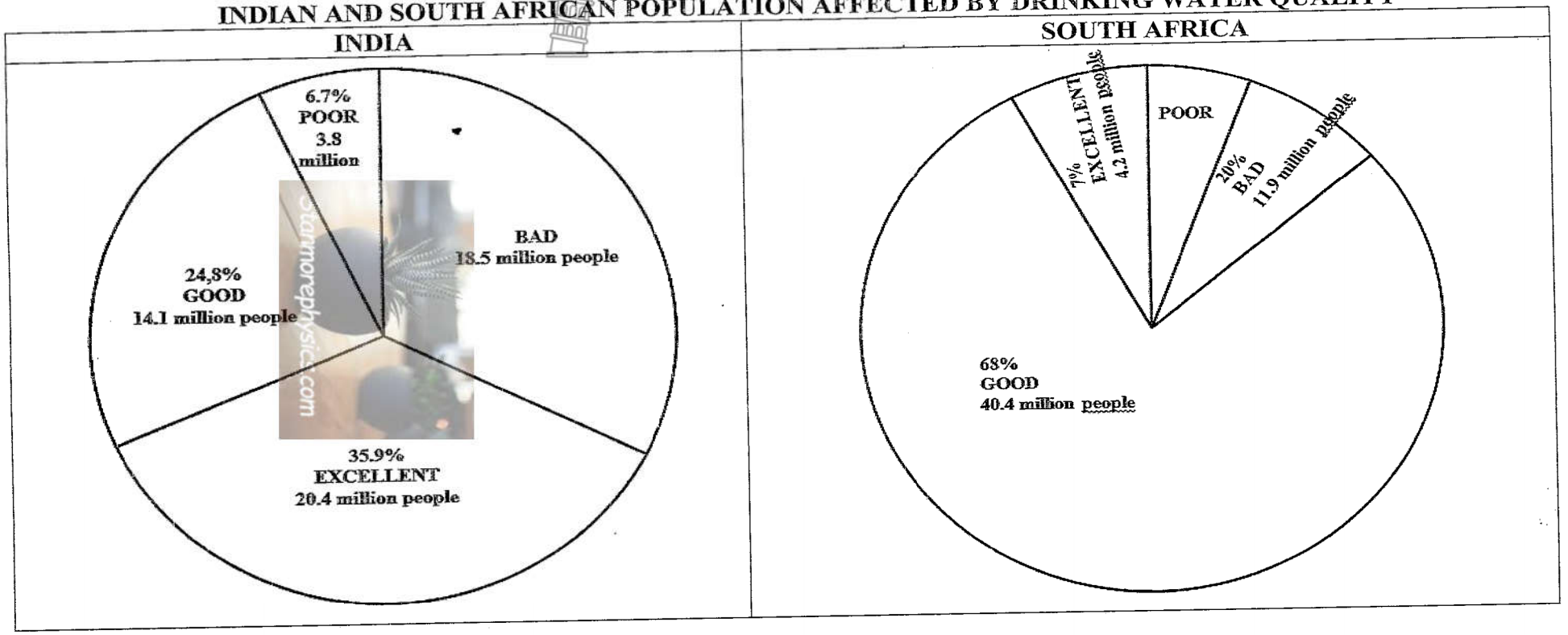
BOX AND WHISKER PLOTS SHOWING THREE MOST POPULAR DRINKS



ANNEXURE E

QUESTION 5.3

INDIAN AND SOUTH AFRICAN POPULATION AFFECTED BY DRINKING WATER QUALITY



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PREPARATORY EXAMINATION
SEPTEMBER 2023
MARKING GUIDELINES (ERRATA)

SYMBOL/SIMBOL	EXPLANATION/VERDUIDELIKING
M	Method/METODE
MA	Method with Accuracy/metode met akkuraatheid
CA	Consistent accuracy/konstante akkuraatheid
RCA	Rounding consistent Accuracy/afrond konstante akkuraatheid
A	Accuracy/akkuraatheid
O	Explanation/ verduideliking
C	Conversion/omskakeling
S	Simplification/vereenvoudiging
RT/RG/RD/RM/R	Reading from table/Reading from graph /diagram/ map/Reading from Plan/lees van grafiek , diagram ,kaart
F	Choosing the correct formula/korrekte formule
SF	Correct substitution in a formula/korrekte substitusie in formule
C	Opinion/opinie
J	Justification/regverdiging
P	Penalty e.g. for no units, incorrect rounding off etc. / pennaliseer vir eenhede, afrond ens.
Re	Reason/rede
Ro	Rounding /afrond
AO	Answer only ,full marks/antwoord alleen vol punte

These marking guidelines consists of 06 pages

QUESTION 1		Answer Only Full Marks	
Ques	**Solution**	**Explanation**	**Level**
1.1.			
1.1.3.	Price in rand = 83,28 c/l ÷ 100✓MA = R0,8328 = R0,85 ✓R	1MA dividing by 100. 1R rounding. (2)	F L1 E
1.1.4.	Total pump price = R3,94 + R2,18 + **R0,83** + R12,34 + R4,12 ✓**MA** = R 23,41 ✓**CA**	**CA from 1.1.3** 1MA adding all correct values 1CA simplification (2)	F L1 E
1.2			
1.2.1.	Double bar graph ✓**A**✓**A** OR **Horizontal double bar graph** **OR** **Multiple bar graph** **OR** **Compound bar graph**	1A correct type 1A bar graph (2)	D L1 E
1.2.4	**ACCEPT** Upington Phalaborwa ✓✓**RT** Kimberley Bloemfontein	2RT	
1.3			
1.3.3	School number 8 ✓✓**RT**	2RT	
1.3.4	✓**RT** **293 050 : 328 000** ✓**A** **5 861 : 6 560** ✓**CA** **OR** **293 050 : 328 000** **1 : 1,119262924**	1RT correct values 1A correct order 1S simplification (3)	D L1 E

	OR **293 050 : 328 000** **0,893445122 : 1**		

QUESTION 2

Ques	Solution	Explanation	Level
2.1.			
2.1.3	Total monthly payment(P) = R15 226,95 + R 69,00 ✓**MA** = **R15 295,95** ✓**A**	1MA adding correct values 1A simplification (2) **AO**	F L2 E
2.1.4	✓**RT** % Instalment = $\frac{\text{R15 226,95}}{\text{R781 790,48}} \times 100\%$ ✓**RT** = **1,947702152%** ✓**CA** **OR** = **1,948** **OR** = **1,95%** **OR** = **2%**	1RT Numerator 1RT Denominator 1CA simplification **NPR** (3)	F L3 M
2.1.5	Total amount ✓**A** = **R15 295,95** × 71 months + R283 560,10 ✓**MA** = **R1 086 012,45** + R283 510,10 ✓**S** = **R1 369 572,55** ✓**CA**		

QUESTION 3			
Ques	**Solution**	**Explanation**	**Level**
3.1.2	**One million seven thousand one hundred and fifty five.✓✓A**	2A correct words (2)	D L1 E
3.1.4	**= 852 382,75 ✓CA** **OR** **= 852 382,8** **OR** **= 852 383**	**NPR**	
3.1.5	**The number of tourists decreased as the months increased. ✓✓O**		
3.2			
3.2.2	**Theft from vehicles in 2021** $= 6\,467 \times \frac{100}{120,8}$ **= 5 353,476821** **= 5 400**		
3.2.3	% Increase = $\frac{966 - 697}{697} \times 100\%$ **✓RT ✓RT** **= 38,59% ✓CA** **OR** **= 38,6%** **OR** **= 39%**	1RT Numerator 1RT Denominator 1CA simplification **NPR** (3)	F L3 M

QUESTION 4			
Ques	**Solution**	**Explanation**	**Level**
4.1			
4.1.3	Annual tax **✓RT** = R239 452 + [41% × (R1 033 125 – R817 600)] **✓SF** = R239 452 + R88 365,25 **✓MA**	**CA from Q4.1.2** 1RT correct table 1SF substituting value 1MA adding values 1CA simplification	F L3 D

	= R327 817,25 ✓**CA** Annual tax payable ✓**RT** ✓**RT** = R327 817,25 – **R16 425** – **R 9 000** – R 2 997 ✓**MCA** = R299 395,25 ✓**CA**	1RT for R16 425 1RT for R9 000 1MCA subtracting correct values 1CA simplification (8)	
4.3.1 – 4.3.2	The Examiner indicates that learners should have used a ruler to measure the exact point. **NO RANGE SHOULD BE USED.**		
4.3.2	IQR = $Q_3 - Q_1$ ✓**MA** = 350 ✓**RT** – 170 ✓**RT** = 180 ✓**CA**	**1MA concept of IQR**	

QUESTION 5			
Ques	**Solution**	**Explanation**	**Level**
5.1			
5.1.3	**Amount including VAT** ✓**RT** **= 0 kWh** × R2,29 + R185 × 1,15 ✓**MA** = R212,75 ✓**CA** Her claim is valid. ✓**O** **OR** **Amount including VAT** ✓**RT** = R185 × 1,15 ✓**MA** = R212,75 ✓**CA** Her claim is valid. ✓**O**		
5.3			
5.3.1	**OR** Poor drinking water quality ✓**RT** = 5% × 59 390 000 ✓**M** = 2 969 500 ✓**S**	1RT correct value 1M multiply by 5% 1S simplification (3)	
5.3.2	Probability (choosing a person with an Excellent drinking water quality) = 100% – (6,7% + 24,8% + 35,9%) ✓**MA** = 32,6% ✓**CA**	**Maximum of 2 marks only** **(2)**	
5.3.3	✓**RT** Difference = 20,4 million – 4,2 million ✓**MA** = 16,2 million ✓**CA**		