METRO SOUTH DISTRICT
Common Paper 1

GRADE 12

MATHEMATICAL LITERACY P1

MAY/JUNE 2024

Marks: 100
Time: 2 hours

This paper consists of 9 pages, 1 ANSWER SHEET and an addendum with 3 annexures.

INSTRUCTIONS AND INFORMATION:

1. This question paper consists of FOUR questions. Answer ALL the questions.

2. Use the ANNEXURES to answer the following questions:

   - ANNEXURE A for QUESTION 3.1
   - ANNEXURE B for QUESTION 4.1
   - ANNEXURE C for QUESTION 4.2

3. Number the answers 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 the calculations clearly.

7. Round off ALL final answers appropriately to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

QUESTION 1

1.1 Jessica is an aspiring entrepreneur that sells roti and curry at her school's Market Monday for R35,00. She buys the ingredients at the local supermarket.

TABLE 1 below shows the prices of the different ingredients per unit.

TABLE 1: COST OF INGREDIENTS PER UNIT

Potatoes - R49,90 per 3 kg	Flour - R12,90 per 500 g	Butter – R79,00 per 500 g
		
Curry spice – R25,00 per unit of 50 mℓ	Beef mince – R99,00 per 1 kg pack	Take away boxes R80 per bag of 60
		

NOTE: A unit refers to the combined number of items sold as a package.

Use the information above to answer the questions that follow.

1.1.1 Determine the cost of buying TWO bags of potatoes. (2)

1.1.2 If Jessica buys ONE unit of each ingredient, determine her total cost. (2)

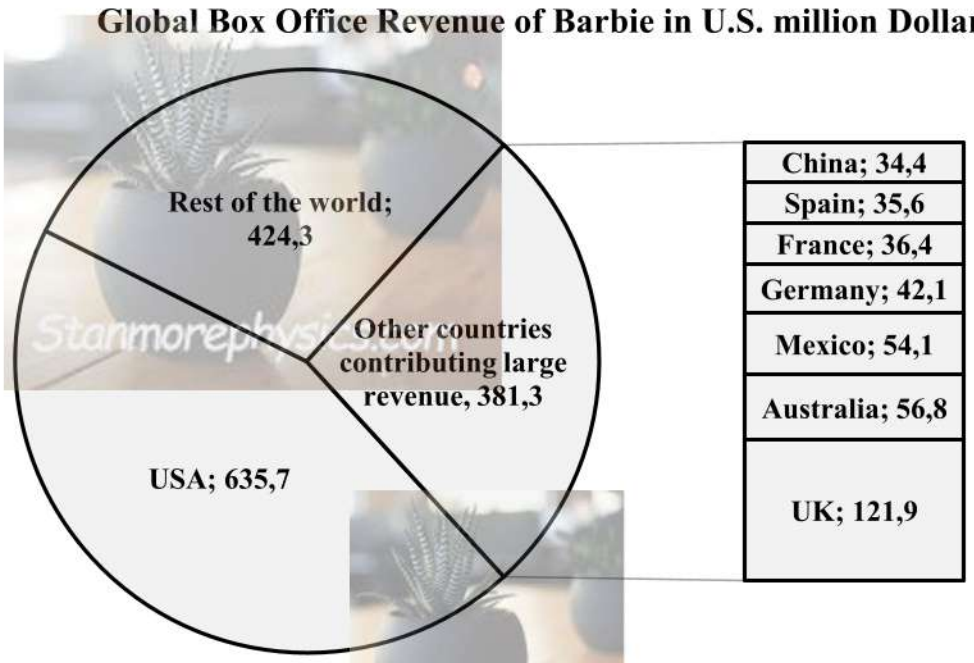
1.1.3 Write the ratio of the total price of curry spice to the total price of beef mince. (2)

1.1.4 If the cost price of one roti is R17,06, calculate the cost price as a percentage of the selling price. (2)

1.1.5 Calculate the price for one takeaway box. (2)

1.2 The Barbie movie was a blockbuster movie released in 2023.

The graph below shows the Global box office revenue of the Barbie movie as of October 25, 2023, by region, in U.S. million dollars.



[Adapted from the-numbers.com]

Use the information above to answer the questions that follow.

1.2.1 Define the term *revenue* in the given context. (2)

1.2.2 Write as a number in digits, the total USA revenue for the Barbie movie. (2)

1.2.3 Write down the country with the lowest Global box office revenue. (2)

1.2.4 Classify the data as numerical or categorical. (2)

1.2.5 Identify the median country of the "other countries contributing large revenue". (2)

1.2.6 Write down an instrument for collecting similar type of data should you wish to determine the most popular movie at your school. (2)

[22]

QUESTION 2

2.1 Mr. Van Wyk is a 66-year-old events manager and earns a salary of R369 600 per annum. He also receives a thirteenth cheque of the same value as one month's salary.

He finds the table below to calculate his annual income tax.

TABLE 2: TAX TABLE FOR THE 2023/24 FINANCIAL YEAR

TAX BRAC-KET	TAXABLE INCOME	TAX RATE (IN RANDS)
1	1 – 237 100	18% of taxable income
2	237 101 – 370 500	42 678 + 26% of taxable income above 237 100
3	370 501 – 512 800	77 362 + 31% of taxable income above 370 500
4	512 801 – 673 000	121 475 + 36% of taxable income above 512 800
5	673 001 – 857 900	179 147 + 39% of taxable income above 673 000
6	857 901 – 1 817 000	251 258 + 41% of taxable income above 857 900
7	1 817 001 and above	644 489 + 45% of taxable income above 1 817 000

TAX REBATES	
Primary	R17 235
Secondary (65 years and older)	R9 444
Tertiary (75 years and older)	R3 145

[Source:sars.co.za]

Use the information above to answer the questions that follow.

2.1.1 Name the government institution responsible for the collection of personal income tax. (2)

2.1.2 Calculate Mr. Van Wyk's total income for the 2023/2024 financial year. (3)

2.1.3 Mr. Van Wyk has an annual pension deduction of R30 030 and does not belong to a medical aid.

Calculate Mr. Van Wyk's income tax payable for the 2023/2024 financial year. (7)

2.2 Mr. Van Wyk will participate in the Two Oceans marathon.

He stays in Blouberg and will have to travel to the Greenpoint stadium daily for the 5 days before the race for training.

The stadium is 20 km from where he stays.

He is considering the travelling options indicated in the table below.

TABLE 3: COST OF UBER AND MyCiTi BUS.

Company	Tariff	
Uber	Initial fee	R6,40
	Cost per km	R9,50
MyCiTi bus	A day fare of R88	

[Adapted from taxigator.net and myciti.org.za]

Use the information above to answer the questions that follow.

2.2.1 Define the term *tariff* within this given context. (2)

2.2.2 Write down a formula to calculate the cost when taking an uber in the following format:

Cost of Uber = …… (2)

2.2.3 Mr. Van Wyk states that he will save more than R1 500 during the week if he uses the MyCiTi bus.

Verify his statement by showing the necessary calculations. (9)

2.2.4 Give one possible reason why Mr. Van Wyk would still choose an Uber despite the cost. (2)

[27]

QUESTION 3

3.1 ANNEXURE A shows the exporting countries of wheat products from 2020/2021 to 2023/2024 as well as a comparative box-and-whisker plot of some of the statistics.

Use ANNEXURE A to answer the questions that follow.

3.1.1 State whether the data in TABLE 4 is discrete or continuous. (2)

3.1.2 Determine the probability, as a common fraction, of randomly selecting a country that exported more than 20 000 000 metric tons of wheat products in 2023/2024. (2)

3.1.3 Calculate the percentage increase for the export of wheat products for Russia from 2020/2021 to 2023/2024. Round your answer to the nearest percentage.

You may use the formula:

$$\textbf{Percentage Increase} = \frac{\text{Export (2023/2024) - Export (2020/2021)}}{\text{Export (2020/2021)}} \times 100\%$$

(4)

3.1.4 The mean of the 2020/2021 export of the countries shown is 18 517. The value for Australia has been omitted.

Calculate the value of Australia by showing all calculations.

You may use:

$$\textbf{Mean} = \frac{\textbf{Sum of the values}}{\textbf{number of values}}$$

(4)

3.1.5 A data analyst wanted to compare the exportation of wheat products more visually for the year 2022-2024 by using box-and-whisker plots.

Study the box and whisker plots on ANNEXURE A to answer the questions that follow:

a) Write down the value of **A** shown on the box-and-whisker plots. (2)

b) Calculate the interquartile range (IQR) for the year 2022/2023.

You may use the following formula: **IQR = Q3 − Q1** (3)

c) Identify the period in which the 2nd quartile was the lowest. (2)

d) In a recent report it was stated that the export of wheat products was more successful in 2023/2024 in comparison to 2021/2022.

Explain whether the findings of the report are valid, by referring to quartiles and maximum values. (3)

3.2 Whole grains provide fibre, vitamins, minerals, and other nutrients.

ANSWER SHEET 1 shows the growth chart – stature-for-age & weight-for-age for boys aged 2-20 years.

NOTE:

- Stature for age – The height of the boy according to his age.
- Weight for age – The weight of the boy according to his age.

Use ANSWER SHEET 1 to answer the questions that follow:

3.2.1 Write down the percentile on which an 18-year-old boy with a weight of 85kg will be. (2)

3.2.2 A 17-year-old boy has a stature of 75 inches and weighs 60 kg.

a) Use ANSWER SHEET 1 to plot his weight as well as his stature. (2)

b) Without calculating the boy's BMI, describe his body by referring to percentiles that he is categorized in. (3)

[29]

QUESTION 4

4.1 Mr Noordien wants to move to the city. He researches some facts about Cape Town and notes that Cape Town's population is increasing annually.

The statistics of this population growth is indicated on the graph on ANNEXURE B.

Use the information in ANNEXURE B to answer the questions that follow

4.1.1 Write down the value of A, the percentage increase from the previous year, shown on the graph. (2)

4.1.2 Mr. Noordien notes that in 2010 and 2011 the population growth percentage was the same, he therefore states that in that case the population numbers should be the same.

Justify why this statement is incorrect. (2)

4.1.3 Calculate **B**, the number of people living in Cape Town in 2017. (3)

4.2 The Noordien family moved to Cape Town in 2022. An extract from Mr. Noordien's municipal rates account is shown in ANNEXURE C. The water tariffs for the City of Cape Town are shown below.

TABLE 5: WATER TARIFFS FOR THE CITY OF CAPE TOWN.

WATER STEPS (1kℓ = 1000 litres)	**Tariff R/kℓ 2022/23. From 1/07/2022 Incl. VAT**	**Tariff R/kℓ 2023/24. From 1/07/2023 Excl.VAT**
Step 1 ($0 \leq 6$kℓ)	R19,42	R18,3392
Step 2 ($>6 \leq 10,5$kℓ)	R26,69	R25,200
Step 3 ($>10,5 \leq 35$kℓ)	R36,27	R34,252
Step 4 (>35kℓ)	R66,93	R63,200

Use the information in the table above and ANNEXURE C to answer the following questions

4.2.1 Identify the price per kilolitre that you would pay in step 2 in 2022/2023. (2)

4.2.2 Find the value of **A**, the daily average of water consumption. (3)

4.2.3 Mr. Noordien states that the water tariff has decreased from 2022/23 to 2023/24.

Verify his statement by referring to the tariff in step 4. Show all calculations. (3)

4.2.4 Show how the water account of R870,37 was calculated. (7)

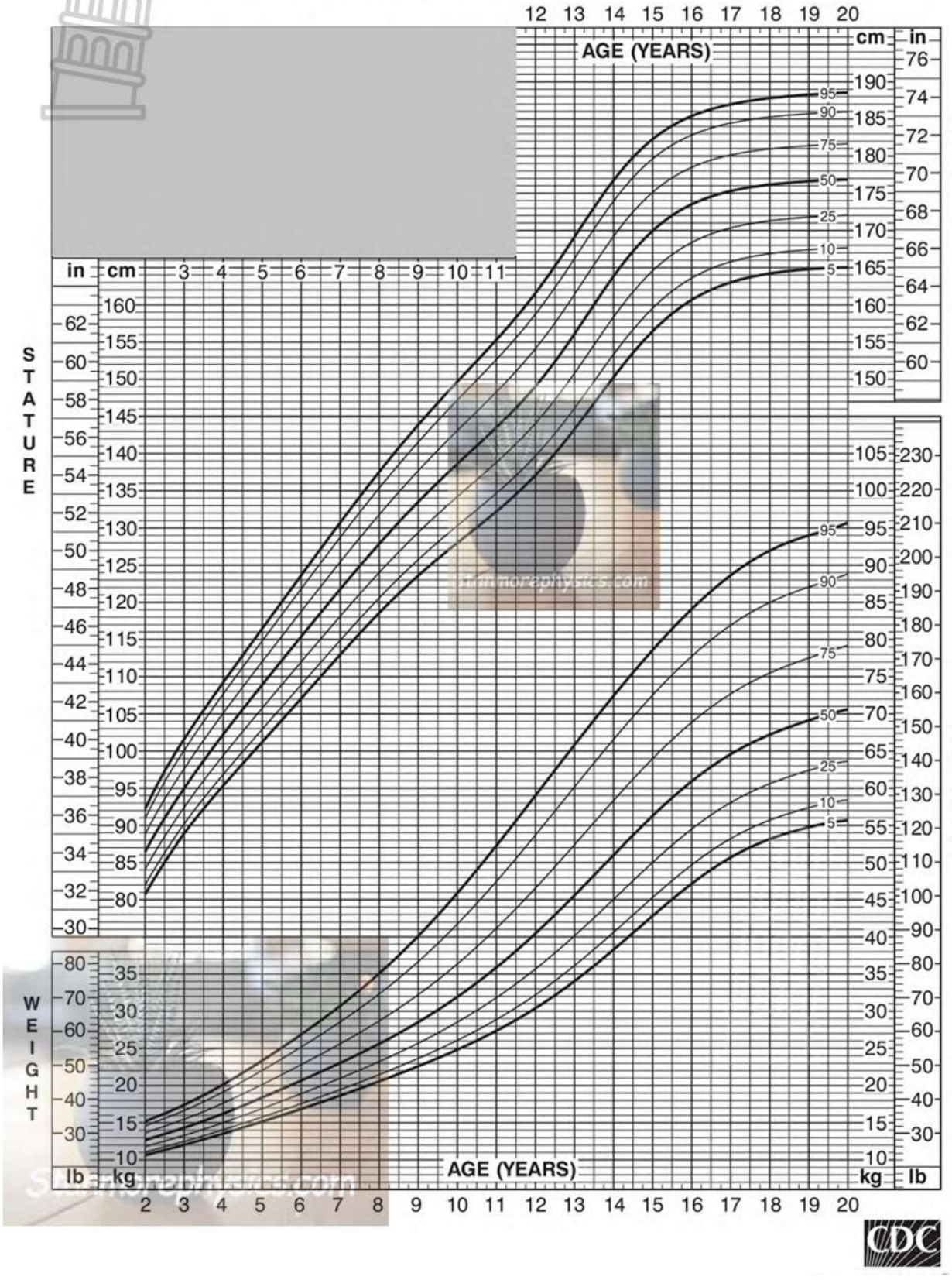
[22]

TOTAL: 100

ANSWER SHEET 1:

QUESTION 3.2: NAME OF LEARNER:_____ GR12 ( )

GROWTH CHART – STATURE-FOR-AGE & WEIGHT-FOR-AGE (BOYS 2-20 YEARS)



METRO SOUTH DISTRICT
Common Paper 1

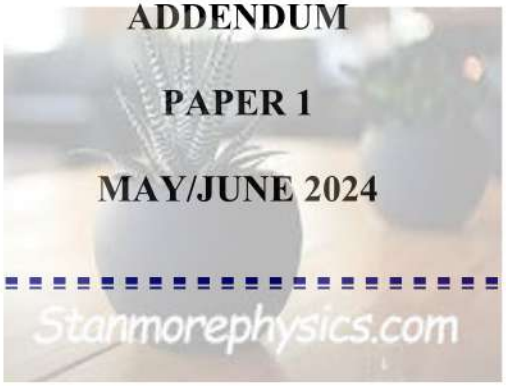
GRADE 12

MATHEMATICAL LITERACY

ADDENDUM

PAPER 1

MAY/JUNE 2024



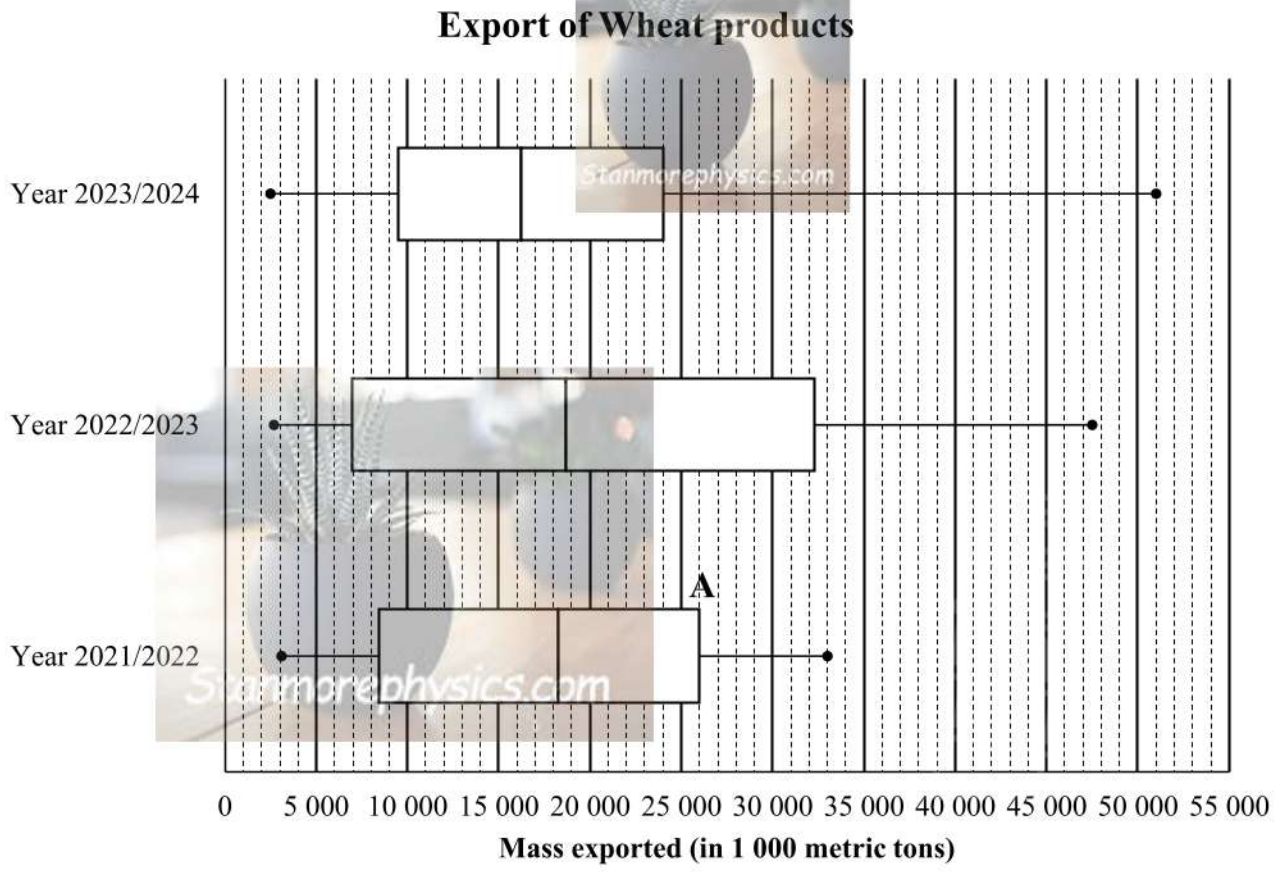
This addendum consists of 4 pages with 3 annexures.

ANNEXURE A
QUESTION 3.1
TABLE OF EXPORT OF WHEAT PRODUCTS FOR FOUR PERIODS & BOX-AND-WHISKER PLOT OF THREE OF THOSE PERIODS.

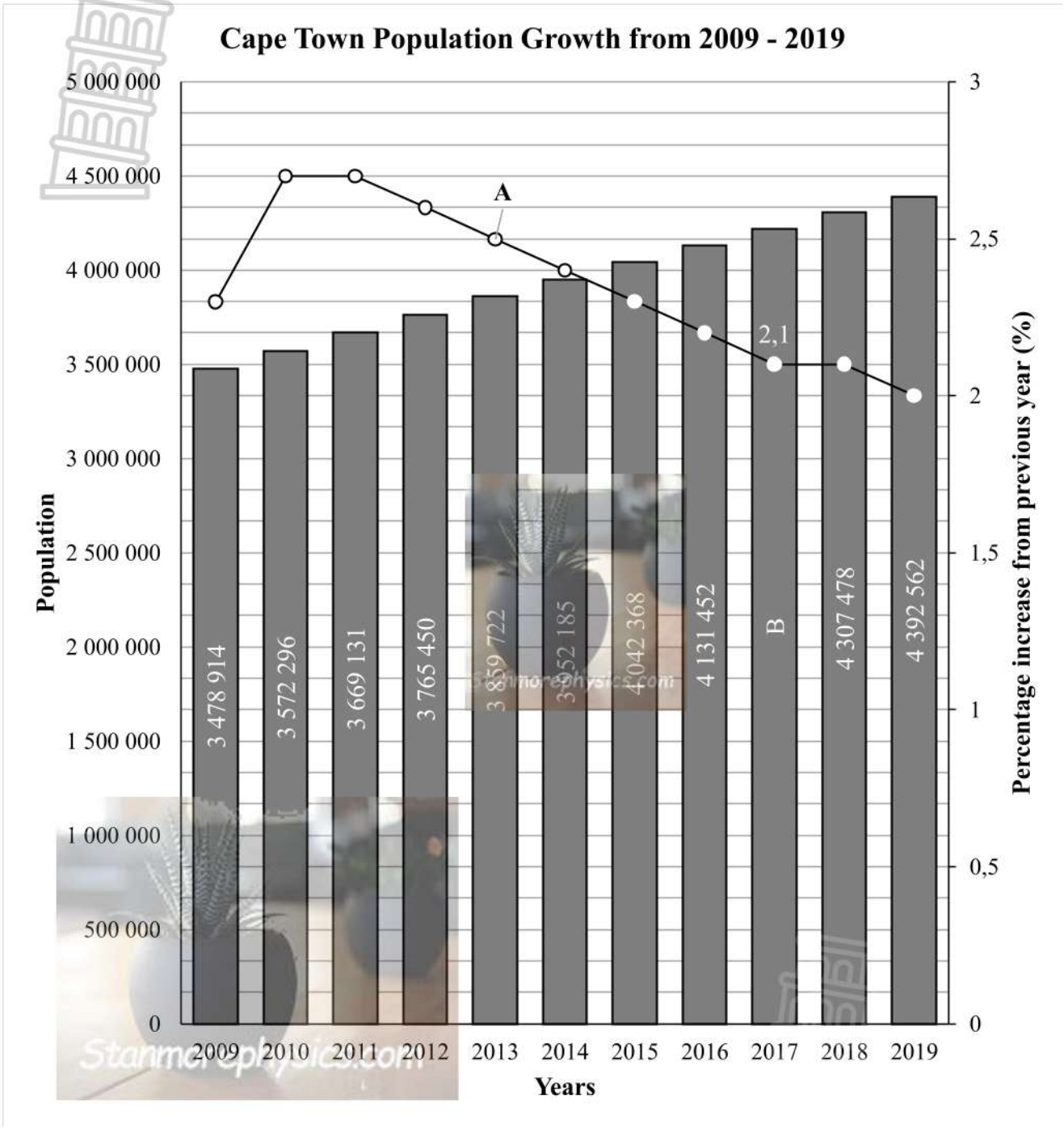
TABLE 4: EXPORT OF WHEAT PRODUCTS

COUNTRY	2020/2021	2021/2022	2022/2023	2023/2024
	(mass in 1 000 metric tons)			
Russia	39 100	33 000	47 500	51 000
European Union	29 736	31 915	35 079	36 500
Canada	27 722	14 990	25 309	24 000
Australia	…	25 958	32 329	22 000
United States	26 636	21 501	20 262	20 000
Ukraine	16 851	18 844	17 122	12 500
Kazakhstan	8 128	8 455	9 862	10 000
Argentina	9 597	17 651	4 681	9 500
Turkey	6 771	6 646	6 953	8 500
Brazil	911	3 105	2 689	2 500

[Adapted from https://www.statista.com]



ANNEXURE B
QUESTION 4.1:



[Source: Profile and Analysis: City of Cape Town September 2020]

ANNEXURE C
QUESTION 4.2

EXTRACT FROM MUNICIPAL RATES ACCOUNT

ADDRESS: 32 A FYNBOS CRESCENT, PROTEA HEIGHT / Erf 2013

WATER (Period 29 Oct 2023 to 26 Nov 2023 – 29 Days) (Estimated reading)

Meter No: 3455586 / Consumption 24 kℓ /Daily average	___**A**___
Consumption charge (domestic)	
#	
# Fixed basic charge	71,01

REFUSE (Period 5 Nov 2023 to 5 Dec 2023 – 31 Days)

# Refuse charge (2 × 240 ℓ bin × 2 removal)	314,60

S

SEWERAGE (Period 29 Oct 2023 to 26 Nov 2023 – 29 Days) (Estimated reading)

# Disposal charge	594,25

SUMMARY OF STATEMENT

WATER	R870,37
REFUSE	R361,79
SEWERAGE	R683,39
TOTAL	R1 914,55

METRO SOUTH DISTRICT
Common Paper 1

MATHEMATICAL LITERACY

EXAMINATION PAPER 1

MAY/JUNE 2024

MARKING GUIDELINES

MARKS: 100

Cognitive Distribution for Assessment:

	Level 1	Level 2	Level 3	Level 4
Expected:	30%	30%	20%	20%
Actual:				

Per Topic Distribution for Assessment:

Topic:	Finance	Data Handling	Measurement	Maps & Plans	Probability
% of task:					

Symbol/*Kode*	Explanation/*Verduideliking*
M	Method/*Metode*
MA	Method with accuracy/*Metode met akkuraatheid*
CA	Consistent accuracy/*Volgehoue akkuraatheid*
A	Accuracy/*Akkuraatheid*
C	Conversion/*Herleiding*
S	Simplification/*Vereenvoudiging*
RT	Reading from a table/graph/document/diagram/*Lees vanaf tabel/grafiek/dokument/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in 'n formule*
O	Opinion/Explanation/*Opinie/Verduideliking*
P	Penalty, e.g. for no units, incorrect rounding off, etc./*Penalisasie, bv. vir geen eenhede, verkeerde afronding, ens.*
R	Rounding off/*Afronding*
NPR	No penalty for rounding/*Geen penalisasie vir afronding nie*
AO	Answer only/*Slegs antwoord*
MCA	Method with consistent accuracy/*Metode met volgehoue akkuraatheid*
RCA	Rounding consistent with accuracy/ *Afronding met volgehoue akkuraatheid*

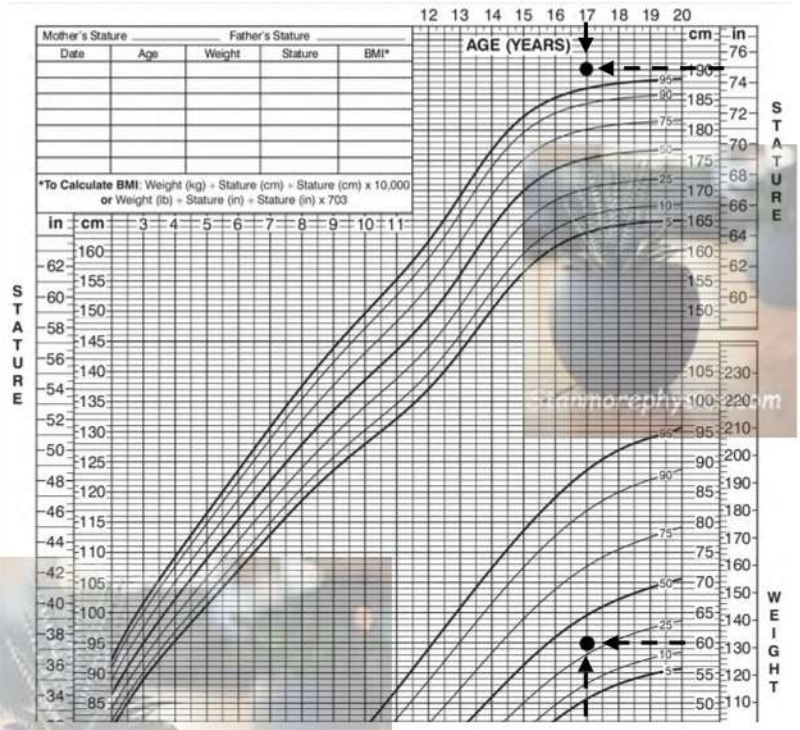
These marking guidelines consist of 8 pages.

QUESTION 1 [22 MARKS/*PUNTE*]			
Q/V	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
1.1.1	✓MA R49,90 × 2 = R99,80 ✓A	1MA multiply by 2 1A R99,80 (2)	F L1
1.1.2	R49,90 + R12,90 + R79 + R25 + R99 + R80✓MA =R345,80✓A	1MA adding correct values 1A R345,80 (2)	F L1
1.1.3	✓A ✓A 25: 99	1A correct values 1A correct order (2)	F L1
1.1.4	✓RT $\frac{17,06}{35} \times 100$ = 48,74%✓A	1RT correct values 1A correct percentage (2)	F L1
1.1.5	$\frac{R80}{60}$ ✓MA =R1,33 per takeaway box ✓A	1MA dividing correct values 1A price per box (2)	F L1
1.2.1	The amount of money that was generated from the movie as a result of ticket sales. ✓✓A	2A definition (2)	F L1
1.2.2	$635 700 000. ✓✓A	2A 635 700 000 (2)	F L1
1.2.3	China. ✓✓RT	2RT China (2)	F L1
1.2.4	Numerical. ✓✓A	2A numerical. (2)	D L1
1.2.5	Germany. ✓✓A	2A concept of median. (2)	D L1
1.2.6	Survey, questionnaire, observation, interview ✓✓A	2A any one of the following (2)	D L1
		[22]	

QUESTION/*VRAAG* 2 [27 MARKS/*PUNTE*]			
Q/V	**Solution/*Oplossing***	**Explanation/ *Verduideliking***	**T&L**
2.1.1	SARS / *SAID* **OR/OF** South African Revenue Service / *Suid-Afrikaanse Inkomste Diens* ✓✓**A**	2A Correct answer (2)	F L1
2.1.2	R 369 600 ✓**RT** + (R 369 600 ÷ 12) ✓**M** = R400 400 ✓**A** **OR** $\frac{369\,600}{12}$ × 13 months =R400 400	1RT R369 600 1M Monthly salary added to annual salary 1A correct amount (3)	F L2
2.1.3	Taxable Income/*Belasbare Inkomste:* R400 400 – R30 030 = R370 370 ✓**MA** Income Tax/*Inkomstebelasting*: ✓**RT** R42 678 + [26% × (R370 370 − R237 100)] ✓**SF** = R42 678 + (26% × R133 270) = R42 678 + R34 650,20 = R77 328,20 ✓**CA** Rebate/*Korting*: R 17 235 + R 9 444 = R 26 679 ✓**A** Minus rebate/*korting* R77 328,20 – R26 679 ✓**M** = R50 649,20 ✓**CA**	**CA 2.1.2** 1MA taxable income 1RT Correct tax bracket 1SF Substituting values correctly. 1CA Income tax 1A R26 679 1M subtracting correct rebate. 1CA Tax payable (7)	F L3
FOR AFRIKAANS LEARNERS	Income Tax/*Inkomstebelasting*: ✓**RT** R 77 362 + [31% × (R 400 400 – R 370 500)] ✓**SF** = R 77 362 + (31% × R 29 900) = R 77 362 + R 9 269 = R 86 631 ✓**CA** Rebate/*Korting*: R 17 235 + R 9 444 ✓**MA** = R 26 679 ✓**A** Minus rebate/*korting* R86 631 – R 26 679 ✓**M** = R 59 952 ✓**CA**	**CA 2.1.2** 1RT Correct tax bracket 1SF Substituting values correctly. 1CA Income tax 1MA Adding correct values 1A R26 679 1M subtracting correct rebate. 1CA Tax payable (7)	

Q/V	Solution/*Oplossing*	Explanation/ *Verduideliking*	T&L
2.2.1	A tariff is the cost per unit. In this case it refers to the cost per trip. ✓✓**A**	2A Definition in context (2)	F L1
2.2.2	Cost of Uber = R6,40 + R9,50 per km ✓✓**A** **OR** ✓✓**A** Cost of Uber = R6,40 + R9,50 × number of kms **OR** Cost of Uber = R6,40 + R9,50 × n, where n = the number of kilometers ✓✓**A**	2A Correct formula NOTE: If a variable is used it should be clarified. (2)	F L2
2.2.3	<u>Cost of Myciti:</u> ✓MA R88 × 5 = R440✓**A** <u>Uber:</u> ✓**SF** R6,40 + (R9,50 × 20 km) = R196,40 ✓**CA** R196,40 × 5 days × 2 ✓**MA** = R 1 964,00 ✓**CA** <u>Difference:</u> R1 964 – R440✓**MCA** = R1 524 ✓**CA** Therefore, his statement is correct ✓**O**	**CA from 2.2.2** 1MA Multiplying daily tariff by 5 1A weekly tariff 1SF Substituting in formula 1CA cost for Uber 1MA multiplying with 2 and 5 1CA correct answer 1MCA Subtracting 2 options 1CA difference in cost 1O Conclusion (9)	F L4
2.2.4	He has more control ✓✓**O** **OR** He does not have to wait ✓✓**O** **OR** He can be picked up and dropped off at his location instead of at a bus stop. ✓✓**O**	2O Any valid reason. (2)	F L4
		[27]	

QUESTION/*VRAAG* 3 [29 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
3.1.1	Continuous ✓✓A	2A correct answer (2)	D L1 E
3.1.2	$\frac{4}{10}$ ✓A ✓A	1A correct numerator 1A correct denominator (2)	P L2 M
3.1.3	**Percentage Increase** = $\frac{\textbf{51 000 - 39 100}}{\textbf{39 100}} \times \textbf{100\%}$ ✓RT ✓SF = 30,43478% ✓CA =30% ✓R	1RT correct values 1SF substituting values 1CA simplification 1R rounding to nearest percentage (4)	D L2 M
3.1.4	$18\,517 = \frac{39\,100 + 29\,736 + 27\,722 + 26\,636 + 16\,851 + \text{Australia} + \ldots}{10}$ ✓MA Australia = 185 170 – (39 100 +29 736 + 27 722 + 26 636 + 16 851 + 8 128 + 9 597 + 6 771 + 911) ✓MA Australia = 19 718 ✓CA	1MA concept of mean 1MA adding values 1MA changing the subject of the formula 1CA simplification (4)	D L3 D
3.1.5a	A = 25 958 ✓✓A	2A estimated value Accept Range (25 900 – 26 000) (2)	D L2 M
3.1.5b	Table values: (2022/23) Q3 = 32 329 and Q1 = 6 953 ✓RT IQR = Q3 − Q1 IQR = 32 329 – 6 953 ✓SF IQR = 25 376 ✓CA **OR** Estimated values from Box and Whiskers: (2022/23) Q3 = 32 500 and Q1 = 7 000 ✓RT IQR = Q3 − Q1 IQR = 32 500 – 7000 ✓SF IQR = 25 500 ✓CA ACCEPT RANGE (32 000 – 33 500; 6 900 – 7 000)	1RT upper and lower quartile correct value 1 SF substitution 1CA simplification **OR** 1RT upper and lower quartile correct value 1 SF substitution 1CA simplification (3)	D L2 M

Q/V	Solution/*Oplossing*	Explanation/ *Verduideliking*	T&L
3.1.5c	2023/2024 ✓✓RT	2RT correct period (2)	D L2 M
3.1.5d	✓O He is correct when it comes to the maximum value. The ✓O median (Q2) is however lower than in the 2021/2022 period. Therefore he is not valid ✓O	1O comparing maximum 1O comparing quartiles 1O conclusion (3)	D L4 D
3.2.1	On the 90th percentile. ✓✓RT	2RT correct reading (2)	D L2 M
3.2.2		1A plotting of stature 75 inch 1A plotting of weight 60 kg (2)	D L2 D
3.2.2b	✓O In terms of his stature, he will fall above the 95th percentile ✓O and his weight just above the 25th percentile. ✓O He will therefore be tall for his age and (rather) thin.	**CA from 3.2.2.** 1O 95th percentile 1O 25th percentile 1O opinion -must refer to the boy. (3)	D L4 M
			[29]

QUESTION 4 [22 MARKS]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T&L**
4.1.1	A = 2,5✓✓RG	2RG correct reading (2)	D L1
4.1.2	The population continued to grow ✓O and therefore has to increase, but it increased by the same rate/margin, so the percentage increase remains the same. ✓✓O **OR** The percentage stayed the same because, even though the population increased it increased by the same percentage. ✓✓O Using the statistics on the graph	1O population grows 1O same rate/margin (2)	D L4
4.1.3	✓RG ✓MA ✓CA 4 131 452 × 1,021 = 4 218 212 or 4 218 213 **OR** ✓RG 4 131 452 × 2,1% = 87 600,492 ✓MA B = 4 131 452 + 87 600,492 = 4 218 212 or 4 218 213 ✓CA	1RG using 2,1% 1MA increase % by 2,1% 1CA simplification 1RG calculating 2,1% 1MA adding the percentage 1CA simplification (3)	D L2
4.2.1	R26,69 ✓✓RT	2RT correct amount (2)	F L1
4.2.2	✓RT✓ MA 24 ÷ 29 = 0,83 kℓ✓CA	1RT 24 kℓ 1MA divide by 29 1CA correct answer in kℓ (3)	F L2
4.2.3	✓ MA R63,200 × $\frac{115}{100}$ = R72,68 ✓ A Therefore, he is incorrect – it increased ✓ O **OR** ✓ MA R66,93 × $\frac{100}{115}$ = R58,20 ✓ A Therefore, he is incorrect – it increased ✓ O	1MA include VAT on correct amount 1A price incl 1O incorrect 1MA exclude VAT on correct amount 1A price excl. 1O incorrect (3)	F L4

Q/V	Solution/*Oplossing*	Explanation/ *Verduideliking*	T&L
4.2.4	STEP 1: 6 × 18,3392 = R110,0352 ✓MA STEP 2: 4,5 × 25,200 = R113,4 ✓MA STEP 3: 13,5 × 34,252 = R462,402 ✓MA BASIC: = R 71,01 ✓RT = 110,0352 + 113,4 + 462,402 + 71,01 ✓MA = R756,8472 ✓CA $\frac{115}{100}$ × R756,8472✓MA = R870,37	1MA Step 1 1MA Step 2 1MA Step 3 1RT Basic 1 MA adding values 1 CA simplification 1MA calculating VAT (7)	F L3
			[22]