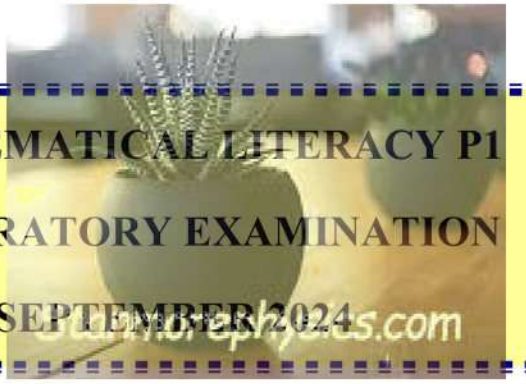
KWAZULU-NATAL PROVINCE

EDUCATION

REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12



MATHEMATICAL LITERACY P1

PREPARATORY EXAMINATION

SEPTEMBER 2024

Stanmorephysics.com

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages and an Addendum with 4 annexures.

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INSTRUCTIONS AND INFORMATION

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

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   - ANNEXURE A for QUESTION 2.1
   - ANNEXURE B for QUESTION 2.1.3
   - ANNEXURE C for QUESTION 4.3
   - ANNEXURE D for QUESTION 5.2

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 calculations clearly.

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

8. Indicate units of measurement, where applicable.

9. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

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QUESTION 1

1.1 University education has become so expensive that only a few learners can afford to pay for their first-year education. TABLE 1 below shows the 2024 first year fees for the five faculties in the top eight South African universities.

TABLE 1: FIRST YEAR FEES (MAXIMUM) FOR EIGHT TOP UNIVERSITIES - 2024

University	BA Degree	BCom Degree	BSc Degree	LLB Degree	BEng Degree
University of Cape Town	R71 400	R98 140	R78 500	R72 570	R84 060
University of Witwatersrand	R65 100	R74 370	R70 430	**A**	R60 060
Stellenbosch University	R55 036	R57 006	R66 358	R55 841	R74 487
University of KwaZulu Natal	R49 628	R53 089	R61 408	R50 404	R59 583
University of Pretoria	R59 000	R60 000	R66 000	R56 000	R64 000
Rhodes University	R58 050	R63 510	R60 392	R65 119	N/A
University of Johannesburg	R56 470	R74 860	R79 860	R53 100	R66 810
University of Free State	R55 470	R55 830	R74 620	R45 390	N/A

[Extracted from www.businesstech.co.za**]**

Use the table and the information above to answer the questions that follow.

1.1.1 State whether the data above for the five faculties is discrete or continuous. (2)

1.1.2 Write in words, the University of KwaZulu Natal fees for BA degree. (2)

1.1.3 Arrange the BSc degree fees for the eight universities in ascending order. (2)

1.1.4 Name the cheapest university for a BCom degree. (2)

1.1.5 Witwatersrand is the most expensive university for a LLB degree. Calculate **A**, given that the range for LLB for the eight universities is R27 610. (2)

1.1.6 If the University of Cape Town has 187 first year students doing Engineering, calculate the total fees received from the students. (2)

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1.2 Nombuso has an account with Brooks Bank. An extract of Nombuso's bank statement is shown below.

NOMBUSO'S BANK STATEMENT

Date	Description	Debit (R)	Credit (R)	Balance (R)
10/03/2024	Balance brought forward			78 271,19
11/03/2024	ATM cash withdrawal	1 800,00		76 471,19
	Service fee	36,00		76 435,19
12/03/2024	Debit card: Spar	2 394,75		74 040,44
	Service fee	3,80		**B**
13/03/2024	Cash deposit		5 200,00	79 236,64
	Service fee	52,00		79 184,64
14/03/2024	Cellphone instant money transfer	300,00		78 884,64
	Service fee	9,00		78 875,64
15/03/2024	Salary deposit		42 893,76	121 769,40
16/03/2024	Debit order: Sanlam	1 203,98		120 565,42
	Service fee	3,50		120 561,92
16/03/2024	Debit order: Auto & Gen	749,68		119 812,24
	Service fee	3,50		119 808,74
16/03/2024	Truworths account (immediate payment)	1 803,98		118 004,76
	Service fee	1,20		118 003,56
20/03/2024	Cash withdrawal (inside the Branch)	9 750,00		108 253,56
	Service fee	300,50		107 953,06

[Extracted from Nombuso's Bank Statement]

Use the bank statement above to answer the questions that follow.

1.2.1 Explain what is meant by *balance brought forward* in the given context. (2)

1.2.2 Determine the missing value **B** in the bank statement. (2)

1.2.3 Calculate the total amount of cash withdrawals in the statement. (2)

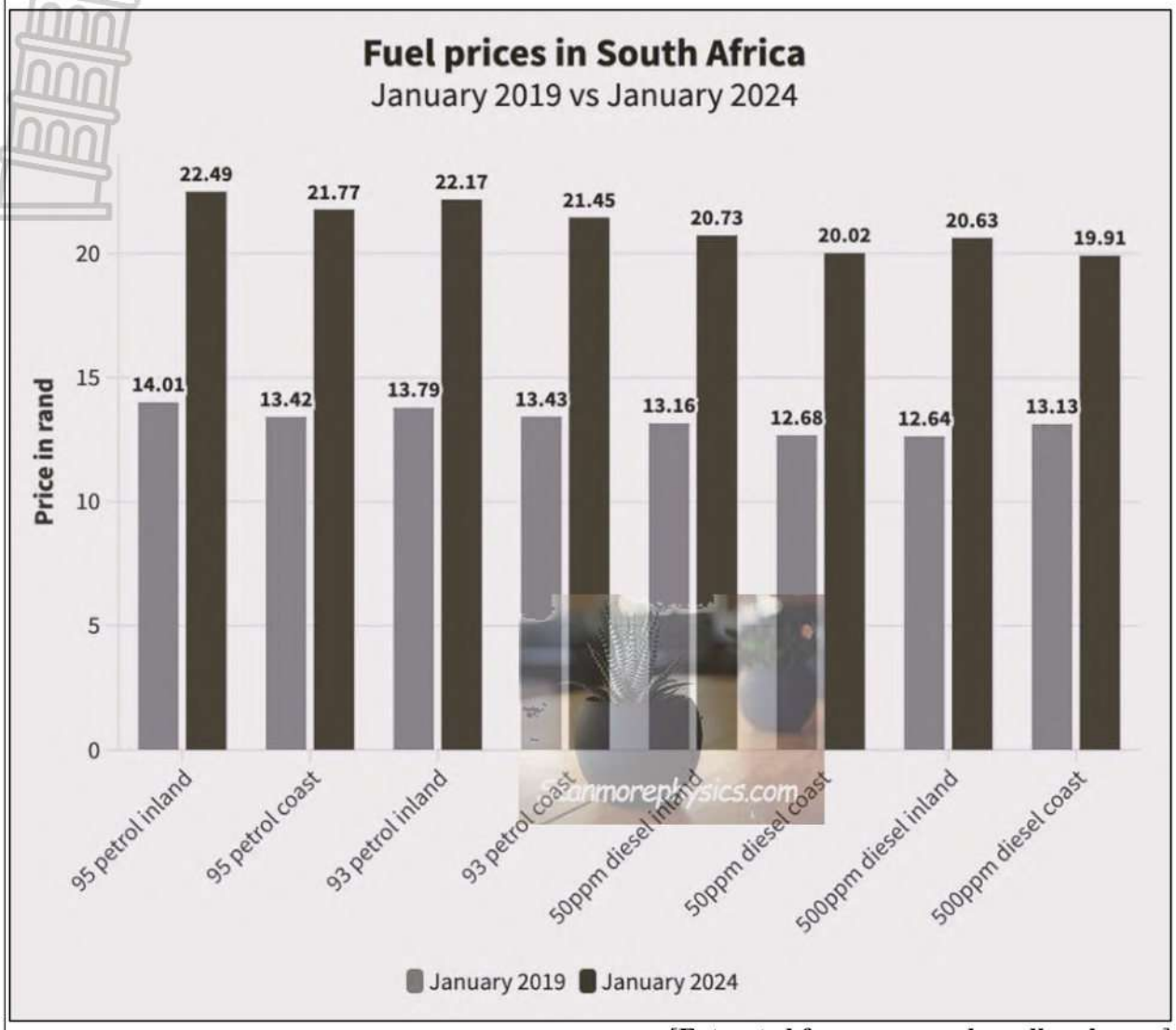
1.2.4 Round off the salary deposited into Nombuso's account to the nearest thousand. (2)

1.2.5 Determine, as a unit ratio in the form **(1 : …)**, the ratio of the service fee of R52,00 to the ratio of the cash deposit on the 13th of March 2024. (2)

1.2.6 Calculate the difference between the highest and lowest service fee amounts in the statement. (2)

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1.3 The graph below shows how the prices of different fuel types have increased between January 2019 and January 2024.



[**Extracted from www.mybroadband.co.za**]

Use the graph above to answer the following questions.

1.3.1 Identify the fuel type that has the second largest difference between the January 2024 price and the January 2019 price. (2)

1.3.2 Calculate the difference between 95 petrol inland and 95 petrol coast prices for January 2024. (2)

1.3.3 Write down the modal price for January 2019 fuel prices. (2)

[30]

QUESTION 2

2.1 Lambert wants to buy a house in Durban. His bank can approve a housing loan of R1 500 000 to be paid back over a period of 25 years at 11,5% interest per annum. He saw an advert on the internet for a house in Morningside (Durban).



Features

3 1 1 3

CASH PRICE: R1 500 000

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[**Source: www.pamgolding.co.za**]

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

2.1.1 Write down any two features of the property above. (2)

2.1.2 Use TABLE 2 in ANNEXURE A to calculate Lambert's monthly repayment on a loan of R1 500 000.

You may use the formula:
Monthly Repayment = (Loan Amount × Loan Factor) ÷ 1 000 (3)

2.1.3 Use TABLE 3 in ANNEXURE B to calculate the total transfer and total bond cost Lambert will have to pay for the property above. (2)

2.1.4 Lambert stated that if the bank gives him a loan of 105% of the property cash price, he will be able to buy the property above and pay the transfer and bond costs.

Verify, showing ALL calculations, whether this statement is CORRECT. (7)

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2.1.5 Calculate the total interest Lambert will pay if the bank agrees to a 105% home loan. (6)

2.1.6 Lambert stated that the total transfer and bond cost is more than $\frac{1}{20}$ of the cash price of the property.

Verify, showing ALL calculations, whether his statement is VALID. (4)

2.2 Lambert realizes that the 105% home loan from the bank will not be enough to cover all the costs. His friend is willing to give him a loan of R7 000 to be paid back in full after 2 years with the following conditions:

- Simple interest at 11,75% p.a for the first year.
- 12% p.a compounded half yearly for the second year.

Use the information above to answer the following questions.

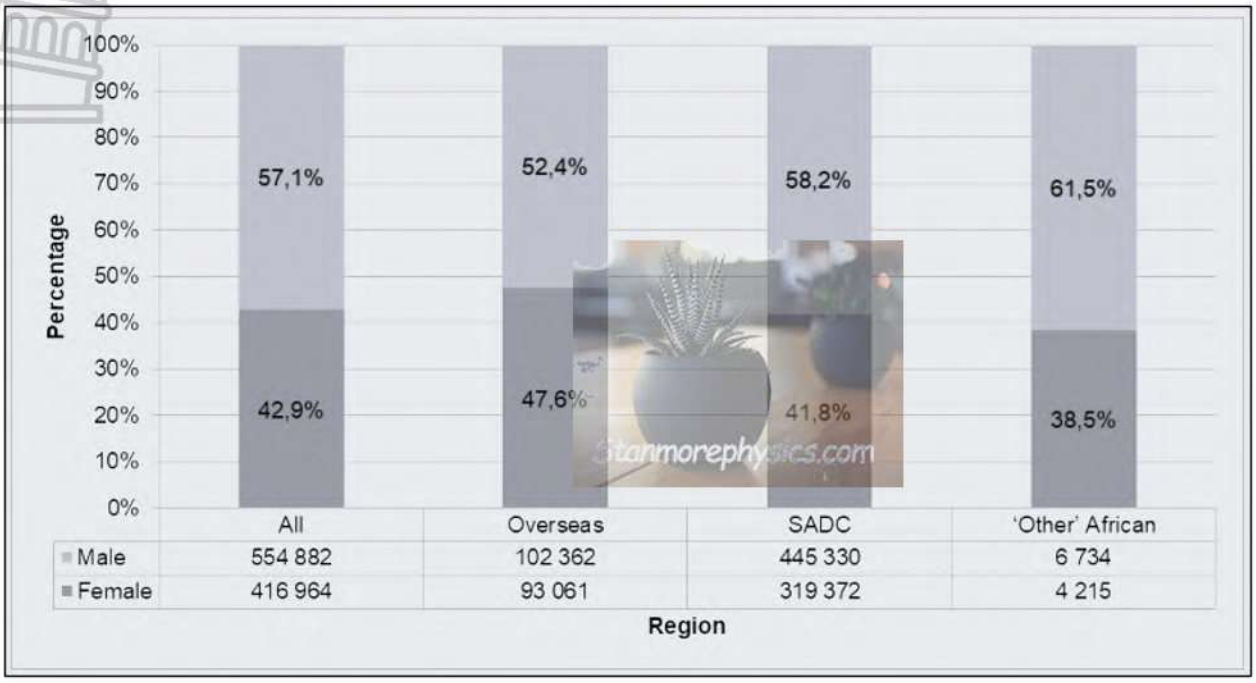
2.2.1 Calculate the compounded half yearly interest rate for 6 months. (2)

2.2.2 Manually calculate the total amount Lambert will have to pay his friend at the end of 2 years. (6)

[32]

QUESTION 3

3.1 Tourism has always contributed a lot to the economy of South Africa. At the end of 2023 the total contribution was R268 billion (4,3% of total economy). The graph below shows the percentage distribution of tourists by region of residence and gender for January 2024.



[**Adapted from www.statssa.gov.za**]

Use the graph above to answer the questions that follow.

3.1.1 Name the type of graph shown above. (2)

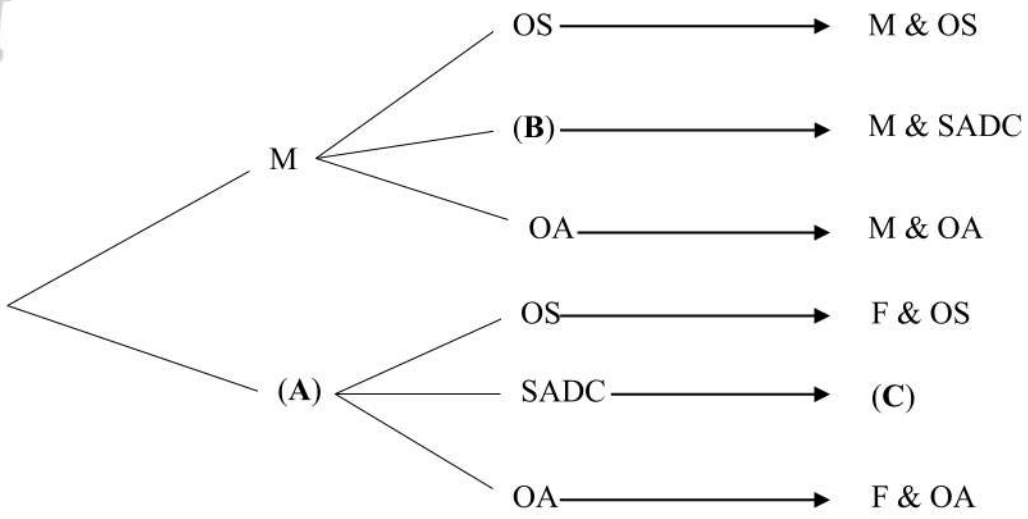
3.1.2 Write down the gender that contributed the majority of tourists for all three regions. (2)

3.1.3 Calculate the mean percentage of the female tourists in all three regions (Overseas, SADC and Other African). (3)

3.1.4 The estimated 2023 population for the SADC region was 389,4 million people. Calculate the percentage of both male and female tourists in the SADC region who visited South Africa. (5)

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3.2 The probability tree diagram below shows all the combinations of tourists visiting the country in January 2024.



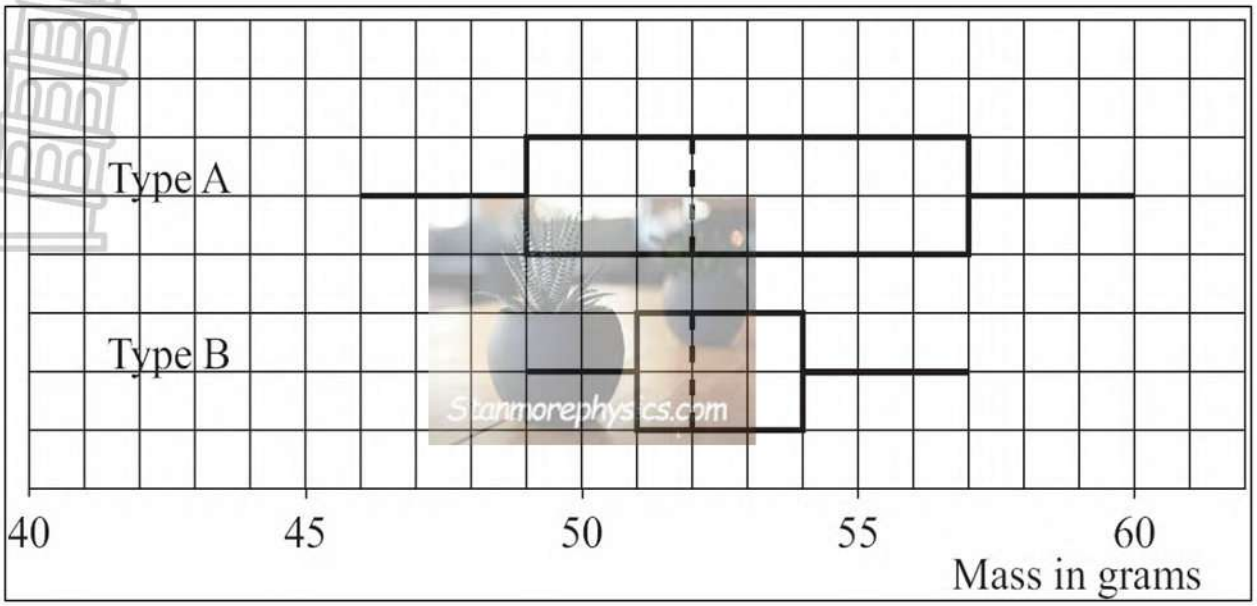
M: Male F: Female OS: Overseas OA: Other Africans
SADC: Southern African Development Community

Use the tree diagram above to answer the questions that follow.

3.2.1 Complete the tree diagram by writing down the missing information for **A, B** and **C**. (3)

3.2.2 Determine the probability, as a simplified fraction, of randomly choosing a tourist from SADC. (3)

3.3 Mr Kert, a prominent farmer in KZN collected data on two types of tomatoes (Type A and Type B) and presented it in the form of a box-and-whisker plot as shown below.



[**Adapted from Kert's Garden Services**]

Use the diagram above to answer the questions that follow.

3.3.1 Write down the 25th percentile for Type B tomato. (2)

3.3.2 Identify the median mass for the two types of tomatoes. (2)

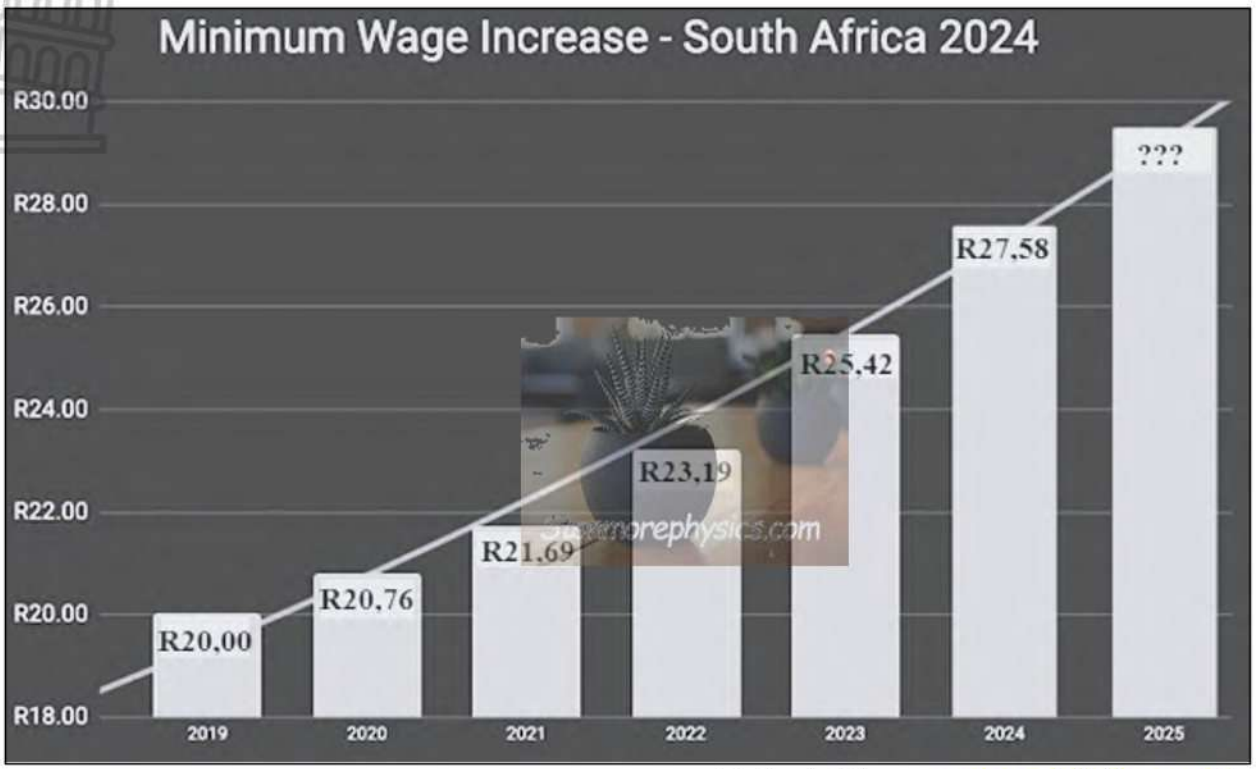
3.3.3 Calculate the difference between the Range and Interquartile Range (IQR) for Type A tomato. (5)

3.3.4 Based on the box and whisker plot shown above for both types of tomatoes, advise Mr Kert which type of tomato he should grow in future. (3)

[30]

QUESTION 4

4.1 Domestic workers have a stipulated minimum rate per hour. The employer must deduct UIF from the employee who will be employed for a year or more. The graph below shows how the hourly rates have changed from 2019 to 2024.



[**Adapted from www.agrigistics.co.za**]

NOTE: 1 MONTH = 4,333 WEEKS

Use the information above to answer the questions that follow.

4.1.1 Calculate the percentage increase in rate from 2023 to 2024.

You may use the formula:

$$\textbf{Percentage Increase} = \frac{\textbf{Rate for 2024} - \textbf{Rate for 2023}}{\textbf{Rate for 2023}} \times 100\%$$ (3)

4.1.2 State one benefit of contributing to the Unemployment Insurance Fund (UIF). (2)

4.1.3 Vuyo, a domestic worker, works 8 hours per day, Monday to Friday. She stated that her income per month after the 1 March 2024 rate increase is now R4 780,17.

Use calculations to verify her claim. (5)

4.2 Mr. Naidoo is an educator and will be turning 65 in January 2025. Given his years of service in the profession, he expects his retirement fund to be R3 240 000. The following tax rule applies to retirement funds.

- At retirement **ONE THIRD** of the lump sum retirement benefit is tax free.

Given below are the 2024/2025 retirement tax tables.

TABLE 4: LUMP SUM RETIREMENT BENEFIT TAX TABLE 2024/2025

Taxable Portion of Lump Sum	Rates of Tax
R1 – R550 000	Nil
R550 001 – R770 000	18% of the amount over R550 000
R770 001 – R1 155 000	R39 600 + 27% of the amount over R770 000
R1 155 001 +	R143 550 + 36% of the amount over R1 155 000

[**Adapted from www.sars.gov.za**]

Use the information above to answer the questions that follow.

4.2.1 Calculate the portion of Mr. Naidoo's lump sum retirement benefit that is tax free. (2)

4.2.2 Show that R143 550 for rates of tax on TABLE 4 is correct. (3)

4.2.3 Calculate the amount of tax that will be deducted from Mr Naidoo's retirement lump sum benefit. (5)

4.3 South Africa faces a significant challenge with unemployment. ANNEXURE C shows the unemployment rates for the nine provinces between second quarter (Q2) of 2023 and third quarter (Q3) of 2023.

Use ANNEXURE C to answer the questions that follow.

4.3.1 Write down the number of provinces that experienced an increase in unemployment from Q2 2023 to Q3 2023. (2)

4.3.2 State ONE reason for an increase in unemployment from Q2 2023 to Q3 2023. (2)

4.3.3 Calculate the unemployment rate change for South Africa between Q2 and Q3 of 2023. (3)

4.3.4 Determine the probability (as a percentage) of randomly selecting a province in which the unemployment rate decreased from Q2 and Q3 of 2023. (3)

[30]

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QUESTION 5

5.1 David owns a home in Richards Bay and the family uses a Phase 1 (80A) electricity connection. Given below are the tariff rates for 2024/2025.

TABLE 5: UMHLATHUZE MUNICIPALITY ELECTRICITY TARIFFS

BLOCK	**USAGE** (kWh)	**TARIFF RATE** (c/kWh) **VAT EXCLUSIVE**
1	0 – 50	107,93
2	> 50 – 350	138,31
3	> 350 – 600	196,51
4	> 600 – 1 500	205,46
5	> 1 500	234,30

[**Adapted from www.umhlathuze.gov.za**]

***Monthly Service Fee Including VAT**: **R417,72**

Use the information above to answer the questions that follow.

5.1.1 Identify the maximum number of kWh in Block 2. (2)

5.1.2 Convert the tariff rate for Block 4 to rand/kWh. (2)

5.1.3 Calculate the monthly service fee charge excluding VAT. (3)

5.1.4 David stated that the total cost (including VAT) for using 687 kWh of electricity is R1 310.

Verify, showing ALL calculations, whether David's statement is VALID. (6)

5.1.5 David paid R825,91 including VAT to the municipality. Calculate the amount charged for electricity excluding the service fee and VAT. (3)

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5.2 Growth Charts are helpful in monitoring the growth pattern of a child or to monitor the fat levels in adults by using the Body Mass Index (BMI). ANNEXURE D shows the height (stature for age) and weight for age percentile curves for boys aged 2 to 20 years.

TABLE 6: NEW AND OLD BMI FORMULAE

Old Formula	New Formula
$\textbf{BMI} = \frac{\textbf{Weight in kg}}{(\textbf{Height in Metres})^2}$	$\textbf{BMI} = \frac{1{,}3 \times \textbf{Weight in kg}}{(\textbf{Height in Metres})^{2{,}5}}$

[**Adapted from www.healthyweightforum.org**]

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

5.2.1 Write down the height of a 2-year-old boy if his height is on 75th percentile curve. (2)

5.2.2 Identify the difference between the old formula and the new formula. (2)

5.2.3 An 18-year-old boy's weight and height are on the 50th and 10th percentile curves respectively. Determine the weight in kilograms and height in metres. (2)

5.2.4 A 15-year-old boy weighs 70 kg and is 1,65 m tall. Use both the old and new formulae given above to calculate the difference in the BMI. (6)

[28]

TOTAL: 150

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MATHEMATICAL LITERACY P1

PREPARATORY EXAMINATION

ADDENDUM

SEPTEMBER 2024

This Addendum consists of 5 pages with 4 Annexures.

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ANNEXURE A

QUESTION 2.1

TABLE 2: FACTOR TABLES FOR BOND/MORTGAGE REPAYMENT

	Mortgage Bonds				Short Term Financing		
Rate	10 Yrs	20 Yrs	25 Yrs	30 Yrs	36 Months	48 Months	60 Months
07,0%	11,61	07,75	07,07	06,65	30,88	23,95	19,08
07,5%	11,87	08,06	07,39	06,99	31,11	24,18	20,04
08,0%	12,13	08,36	07,72	07,34	31,34	24,41	20,28
08,5%	12,40	08,68	08,05	07,69	31,57	24,65	20,52
09,0%	12,67	09,00	08,39	08,05	31,80	24,89	20,76
09,5%	12,94	09,32	08,74	08,41	32,03	25,12	21,00
10,0%	13,22	09,65	09,09	08,78	32,27	25,36	21,25
10,5%	13,49	09,98	09,44	09,15	32,50	25,60	21,49
11,0%	13,78	10,32	09,80	09,52	32,74	25,85	21,74
11,5%	14,06	10,66	10,16	09,90	32,98	26,09	21,99
12,0%	14,35	11,01	10,53	10.29	33,21	26,33	22,24
12,5%	14,64	11,36	10,90	10,67	33,45	26,58	22,50
13,0%	14,93	11,72	11,28	11,06	33,69	26,83	22,75
13,5%	15,23	12,07	11,66	11,45	33,94	27,08	23,01
14,0%	15,53	12,44	12,04	11,85	34,18	27,33	23,27
14,5%	15,83	12,80	12,42	12,25	34,42	27,58	23,53
15,0%	16,13	13,17	12,81	12,64	34,67	27,83	23,79
15,5%	16,44	13,54	13,20	13,05	34,91	28,08	24,05
16,0%	16,75	13,91	13,59	13,45	35,16	28,34	24,32
16,5%	17,60	14,29	13,98	13,85	35,40	28,60	24,58

[Source:www.pkf.co.za]

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ANNEXURE B
QUESTION 2.1.3

TABLE 3: BOND AND TRANSFER COSTS

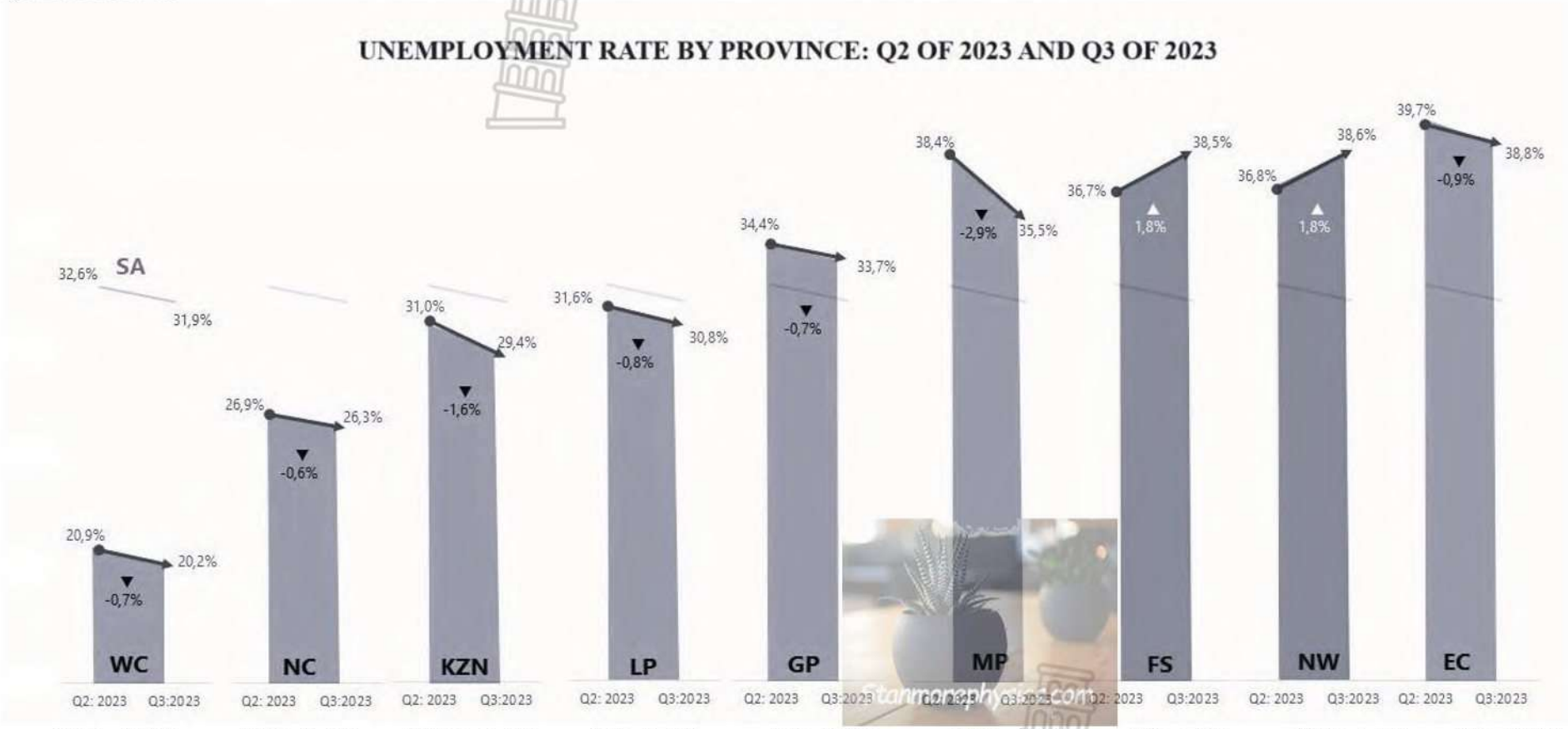
ILLUSTRATIVE TABLE OF BOND AND TRANSFER COSTS

	Transfer Costs						Bond Costs			
Price/Value/ Bond amount R	Transfer fee (Excl)	VAT @ 15%	Deeds Office Levy	Total	Transfer Duty	Total	Bond fee (Excl)	VAT @ 15%	Deeds Office Levy	Total
1 000 000,01	25 220	3 783,00	1 453	30 456,00	0	30 456,00	25 220	3 783,00	1 453	30 456,00
1 050 000,00	25 220	3 783,00	1 453	30 456,00	0	30 456,00	25 220	3 783,00	1 453	30 456,00
1 100 000,00	25 220	3 783,00	1 453	30 456,00	0	30 456,00	25 220	3 783,00	1 453	30 456,00
1 150 000,00	25 220	3 783,00	1 453	30 456,00	1 500	31 956,00	25 220	3 783,00	1 453	30 456,00
1 200 000,00	25 220	3 783,00	1 453	30 456,00	3 000	33 456,00	25 220	3 783,00	1 453	30 456,00
1 200 000,01	27 105	4 065,75	1 453	32 623,75	3 000	35 623,75	27 105	4 065,75	1 453	32 623,75
1 250 000,00	27 105	4 065,75	1 453	32 623,75	4 500	37 123,75	27 105	4 065,75	1 453	32 623,75
1 300 000,00	27 105	4 065,75	1 453	32 623,75	6 000	38 623,75	27 105	4 065,75	1 453	32 623,75
1 300 000,01	27 105	4 065,75	1 453	32 623,75	6 000	38 623,75	27 105	4 065,75	1 453	32 623,75
1 350 000,00	27 105	4 065,75	1 453	32 623,75	7 500	40 123,75	27 105	4 065,75	1 453	32 623,75
1 400 000,00	27 105	4 065,75	1 453	32 623,75	9 000	41 623,75	27 105	4 065,75	1 453	32 623,75
1 400 000,01	28 990	4 348,50	1 453	34 791,50	9 000	43 791,50	28 990	4 348,50	1 453	34 791,50
1 450 000,00	28 990	4 348,50	1 453	34 791,50	10 500	45 291,50	28 990	4 348,50	1 453	34 791,50
1 500 000,00	28 990	4 348,50	1 453	34 791,50	12 000	46 791,50	28 990	4 348,50	1 453	34 791,50
1 500 000,01	28 990	4 348,50	1 453	34 791,50	12 000	46 791,50	28 990	4 348,50	1 453	34 791,50
1 550 000,00	28 990	4 348,50	1 453	34 791,50	14 625	49 416,50	28 990	4 348,50	1 453	34 791,50
1 600 000,00	28 990	4 348,50	1 453	34 791,50	17 625	52 416,50	28 990	4 348,50	1 453	34 791,50
1 600 000,01	30 875	4 631,25	1 453	36 959,25	17 625	54 584,25	30 875	4 631,25	1 453	36 959,25
1 650 000,00	30 875	4 631,25	1 453	36 959,25	20 625	57 584,25	30 875	4 631,25	1 453	36 959,25

[Source: www.profmarkapp.co.za]

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ANNEXURE C
QUESTION 4.3



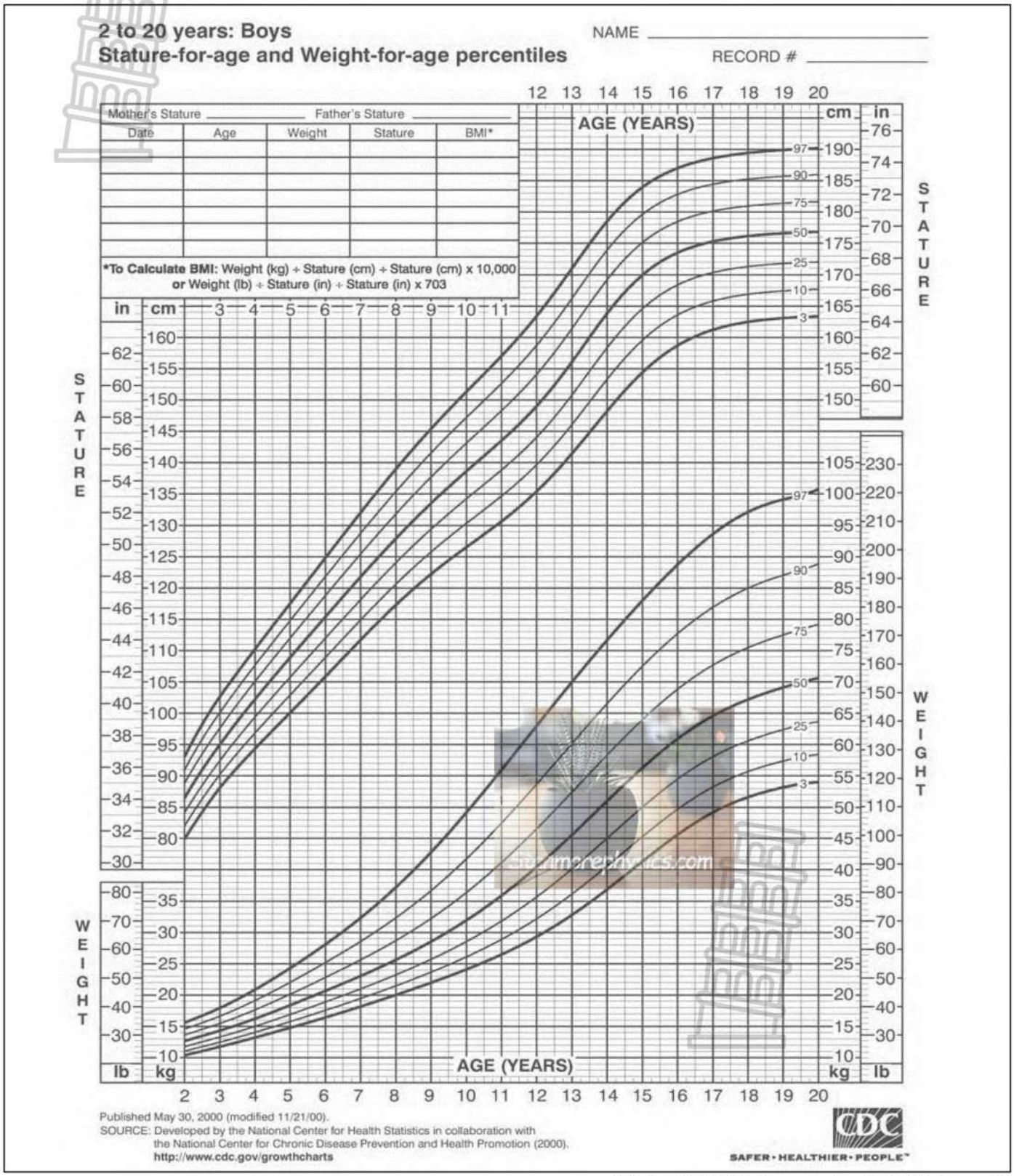
WC: -0,7% NC: -0,6% KZN: -1,6% LP: -0,8% GP: -0,7% MP: -2,9% FS: 1,8% NW: 1,8% EC: -0,9%

[**Extracted from www.businesstech.co.za**]

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ANNEXURE D

QUESTION 5.2



[Extracted from www.kznhealth.gov.za]

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