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**NATIONAL  
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**GRADE 12**

**SEPTEMBER 2023**

**MATHEMATICAL LITERACY P1**

**MARKS: 150**

**TIME: 3 hours**

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This question paper consists of 14 pages, including 1 annexure.

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**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of FIVE questions. Answer ALL the questions.
2. Use the ANNEXURE to answer QUESTION 3.1.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Diagrams are NOT necessarily drawn to scale, unless stated otherwise.
5. Round off ALL final answers according to the context used, unless stated otherwise.
6. Indicate units of measurement, where applicable.
7. Start EACH question on a NEW page.
8. Show ALL calculations clearly.
9. Write neatly and legibly.

**QUESTION 1**

- 1.1 Olwethu wants to open a bank account and decides to research various banks. TABLE 1 below shows the banking fees for different services offered to young people by four of South Africa's largest banks.

**TABLE 1: BANKING FEES FOR SERVICES OFFERED FROM FOUR BANKS**

	<b>BANK A</b>	<b>BANK B</b>	<b>BANK C</b>	<b>BANK D</b>
<b>Monthly Fee</b>	R10,00	R26,00	R9,99	Free
<b>Withdrawal (ATM)</b>	R1,90 per R100	Free	First R1 250 free, then R1,85 per R100, or part thereof	R7,00
<b>Withdrawal at bank counter</b>	R1,60	Free	R2,00	R2,00
<b>Withdrawal at payment point</b>	First R3 000 free, then R0,95 per R100	Free	R1,85 per R100	First R3 000 free, then R1,00 per R100
<b>Debit order</b>	Free	Free	Free	Free
<b>Bank statement</b>	Free	R1,50	R1,20	R1,00

- 1.1.1 Write down the cheapest bank based on the monthly fees. (2)
- 1.1.2 Which withdrawal method is the most expensive one for a client withdrawing R1 200 from Bank A? (2)
- 1.1.3 Determine how much the banking fees will be if Olwethu chooses Bank C and withdraws R1 600 from the bank's ATM. (3)
- 1.1.4 Choose the correct percentage below.

The probability of choosing a bank with counter withdrawal costs of less than R2,00 is:

- A 25%  
 B 50%  
 C 100% (2)

1.2 TABLE 2 below shows the mid-year population estimates for South Africa in 2022.

**TABLE 2: MID-YEAR POPULATION ESTIMATES BY POPULATION GROUP AND SEX FOR 2022**

POPULATION AGE GROUP	MALE	FEMALE
Black African	23 985 479	25 085 330
Coloured	2 601 932	2 737 987
Indian/Asian	794 882	-----
White	2 242 589	2 396 679
<b>Total</b>	<b>29 624 882</b>	<b>30 980 110</b>

[Adapted from Statista]

Use the above information to answer the questions that follow.

1.2.1 Calculate the number of Indian/Asian females. (2)

1.2.2 Write down the total number of Coloured males in words. (2)

1.2.3 Determine the percentage of the female population represented by Black Africans. (3)

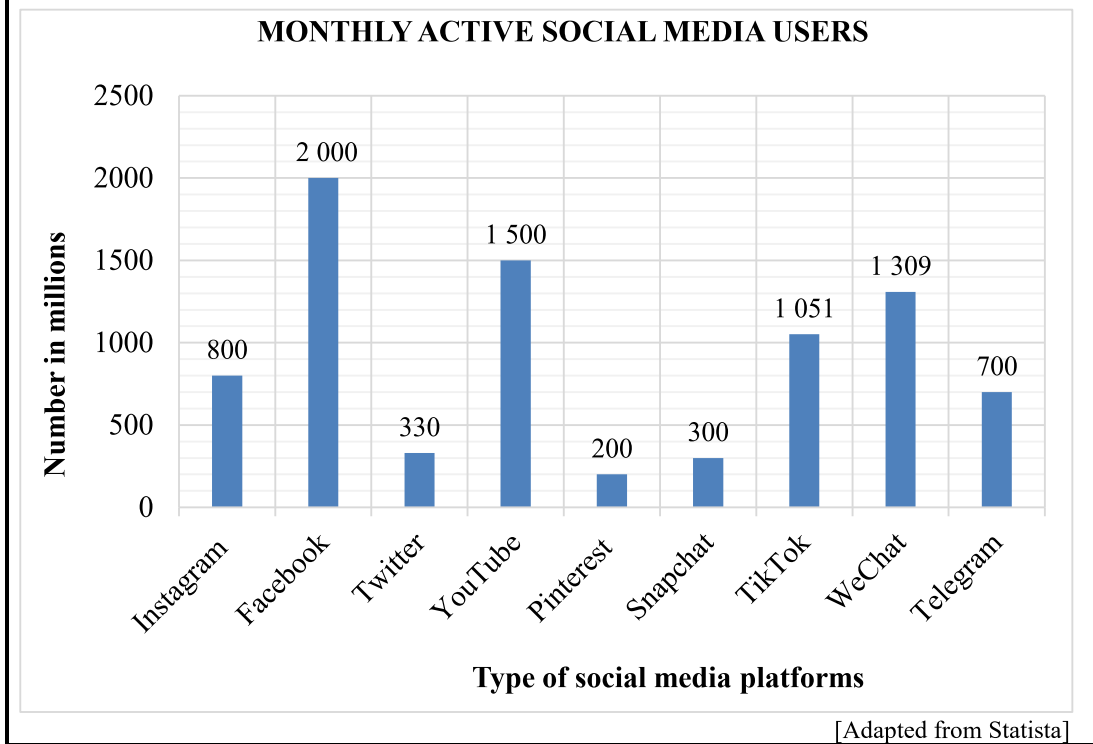
1.2.4 Are the population estimates data numerical or categorical? (2)

1.3 A clothing store is having an annual sale on all items in the shop. In addition, a customer receives a further 50% discount on the cheapest item bought. Mrs Botha chooses a vanity bag for R249,95 and a pair of sandals on sale for R135,95.

	<b>Sale price R249,95</b>		<b>Sale price R135,95</b>
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Calculate the amount Mrs Botha pays for her purchases in total. (3)

1.4 The number of active social media users is given in the graph below.




Use the graph above and answer the questions that follow.

- 1.4.1 Which social media platform is used the most on a monthly basis? (2)
- 1.4.2 Name the type of graph used above to illustrate the monthly types of social media platforms. (2)
- 1.4.3 Calculate the difference between the third most popular and the least popular social media platform. (3)
- 1.4.4 Name the social media platform that has four times more active monthly users than the least popular platform. (2)

**[30]**

**QUESTION 2**

- 2.1 Load shedding is a reality in South Africa at present. Mr Rudolph decided to buy a generator for his family to use during load shedding. Given below is an advertisement for a generator that he intends to buy.

	<p>Ryobi 7,5 KVA 4-stroke key-start petrol generator</p> <p>NOW R13 499</p> <p>WAS R13 999 Save R500</p>
---	--

The company selling this generator offers the following payment options illustrated in TABLE 3.

**TABLE 3: PAYMENT OPTIONS FOR RYOBI GENERATOR**

<b>OPTION 1</b>	Cash Payment
<b>OPTION 2</b>	Hire purchase agreement: 18% deposit and 16,25% p.a. interest charged on the balance. This balance must be paid off in equal instalments over 12 months.

Use the above information to answer the questions that follow.

- 2.1.1 Calculate the percentage discount offered on the Ryobi 7,5 KVA generator. (3)
- 2.1.2 Mr Rudolph stated that he has budgeted R1 000 per month to buy the generator using Payment option 2.
- Verify, showing ALL calculations, whether R1 000 per month will be enough for the monthly instalment. (7)
- 2.1.3 Mr and Mrs Rudolph are considering paying cash for the generator and dividing the payment in ratio 5 : 3 respectively. How much will Mrs Rudolph contribute towards the payment? (3)

- 2.2 The generator uses Petrol 93 or Petrol 95 fuel. TABLE 4 below shows the fuel prices in South Africa in January 2023.

**TABLE 4: SOUTH AFRICAN FUEL PRICES IN JANUARY 2023**

	INLAND	COASTAL
Petrol 93	R21,10	R20,45
Petrol 95	R21,40	R20,75

[Adapted from <http://aa.co.za> – fuel pricing]

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

- 2.2.1 Calculate the difference in the inland and coastal price of Petrol 95. (2)

2.2.2 Petrol 95 decreased by R2,06 per litre in January 2023. Calculate the inland cost of petrol 95 in December 2022. (2)

2.2.3 Calculate the total cost of fuel the generator will use in a 31-day-month if the generator:

- Uses 2,2 litres of petrol 93, per hour
- Is used twice a day and lasts for 2,5 hours each session
- The coastal rate is applied

(4)

2.3 Currently, there is a very serious water shortage in the Nelson Mandela Bay (NMB) District. Dams are running dry and therefore the responsible use of water is very important. TABLE 5 below shows the Nelson Mandela Bay regular tariffs for normal water availability as well as tariffs that are applicable during a water shortage.

**TABLE 5: NMB WATER TARIFFS 2021/2022**

	Number of kilolitres used per day	Tariffs during water shortage Rands/kℓ (VAT exclusive)	Tariffs for normal water availability Rands/kℓ (VAT inclusive)
<b>Step 1</b>	0 up to 0,3 kℓ	R20,81	R19,10
<b>Step 2</b>	More than 0,3 kℓ up to 0,5 kℓ	R31,80	R20,72
<b>Step 3</b>	More than 0,5 kℓ up to 0,8 kℓ	R63,60	R28,96
<b>Step 4</b>	More than 0,8 kℓ up to 1,0 kℓ	R106,00	R49,99
<b>Step 5</b>	More than 1,0 kℓ up to 1,6 kℓ	R159,00	R91,43
<b>Step 6</b>	More than 1,6 kℓ	R318,00	R121,90

VAT – Value Added Tax

[Adapted from NMB Municipality tariff book]

Use the information given in TABLE 5 and answer the questions that follow.

2.3.1 Write down the maximum number of kℓ of water that a customer can use per day in Step 1. (2)

2.3.2 Calculate the amount of VAT paid per kilolitre in Step 3 during normal water availability. (3)

2.3.3 Mr Rudolph claims that if they use 0,73 kℓ of water per day while there is a water shortage, he pays less than R30 per day, including VAT, for the water.

Is Mr Rudolph's claim valid? Show ALL calculations in your answer. (7)

2.3.4 Give a possible reason why the Rudolph family is likely to use more water during December 2023. (2)

[35]



## QUESTION 3

- 3.1 The state of the country's economy is monitored on monthly basis by conducting various surveys. These results are used to establish how businesses are doing in the current state of the economy.

TABLE 6 on the ANNEXURE, gives a summary of retail trade sales for various retailers, for the period April 2022 to September 2022.

Use the information in TABLE 6, given on the ANNEXURE, to answer the questions that follow.

- 3.1.1 Calculate the total sales for hardware, paint, and glass in August 2022. (2)
- 3.1.2 Which type of retailer showed the greatest increase in sales between April and May? (2)
- 3.1.3 Calculate, rounded to the nearest billion, the value of **A** if the mean sales for the month of June 2022 was 14 275, 86 million. (5)
- 3.1.4 Calculate the median number of sales for food, beverages, and tobacco in specialised stores. (4)
- 3.1.5 Write down the sales for general dealers of April to the sales for Pharmaceuticals and medical goods of August, as a unit ratio, rounded off to two decimal places. (2)
- 3.1.6 Determine the percentage change of the total retail trade sales between April and September.

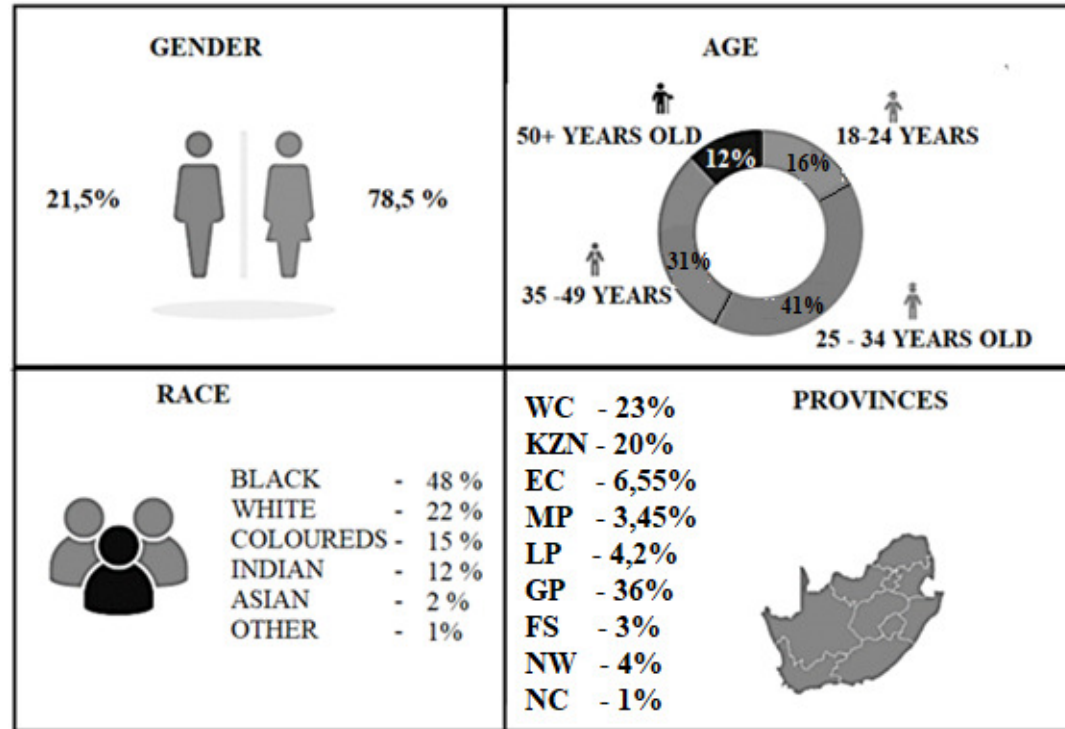
You may use the formula:

$$\text{Percentage change} = \frac{\text{Difference in monthly sales}}{\text{Original monthly sales}} \times 100\% \quad (4)$$

- 3.1.7 Calculate the probability, as a decimal fraction, of randomly selecting retail trade sales for less than R4 400 million. Round your answer off to three decimal places. (3)

- 3.2 South Africans are doing more and more of their shopping online. A survey was done where people had to indicate if they were satisfied with their online shopping experience. Given below are the results of the survey.

**RESULTS OF THE SURVEY REGARDING SATISFACTION WITH ONLINE SHOPPING ACCORDING TO GENDER, RACE, AGE, AND PROVINCE**



[Adapted from [marklives.com](http://marklives.com)]

Use the above information to answer the questions that follow.

- 3.2.1 Which age group is least satisfied with their online shopping experience? (2)
- 3.2.2 Write down the percentage of satisfied female shoppers, as a simplified common fraction. (2)
- 3.2.3 Calculate the interquartile range for the provincial satisfaction.

**You may use the formula:  $IQR = Q_3 - Q_1$**  (5)

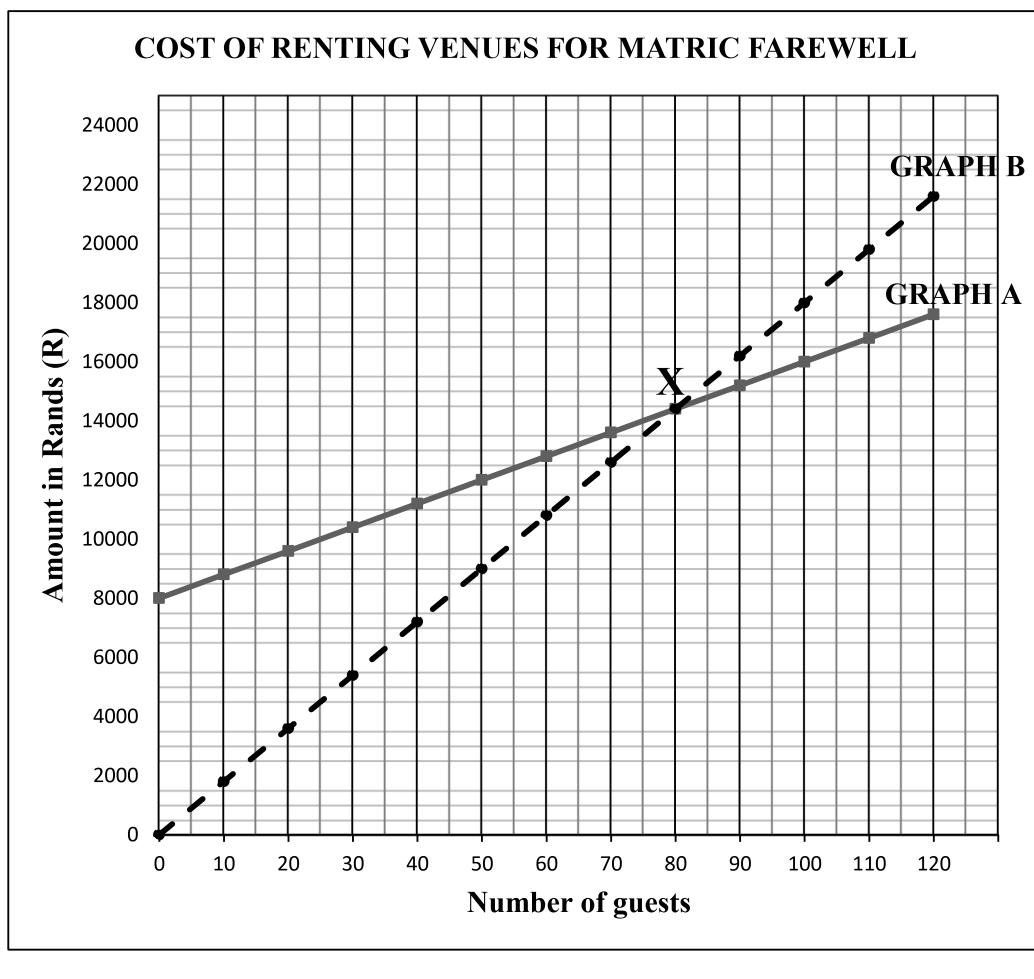
**[31]**

## QUESTION 4

- 4.1 Mrs Mxoli is on the committee that is in charge of planning the matric farewell. The committee is considering two different venues for the farewell. The cost of these two venues is given in the graph below.

Venue 1 – Charges a fixed rental fee of R8 000 and an additional fee of R80,00 per person.

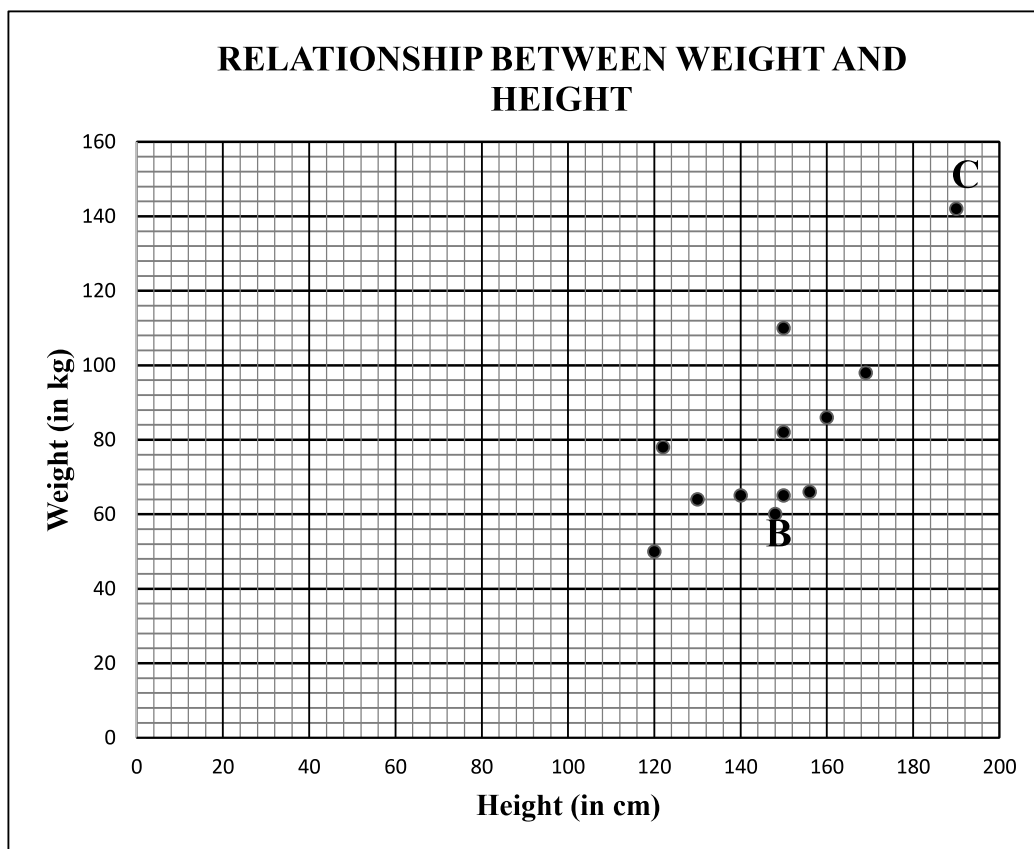
Venue 2 – Charges a rate of R180,00 per person.



Use the above information to answer the questions that follow.

- 4.1.1 Name the graph that represents Venue 2. Only write the letter **A** or **B** in your answer. (2)
- 4.1.2 Provide an equation for calculating the cost of Venue 1. (2)
- 4.1.3 Explain what is happening at the point labelled **X** on the graph. (2)
- 4.1.4 The committee eventually opted to go with Venue 2. Verify, showing ALL calculations, that with 180 guests attending, they would have paid R10 000 less, had they chosen to go with Venue 1 instead. (6)

- 4.2 The graph given below shows the relationship between the height and weight of a high school cricket team.



Weight Status	BMI
Underweight	Less than 18,5
Normal weight	18,5–24,9
Overweight	25–29,9
Obese	More than 30

$$BMI = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

Use the above information to answer the questions that follow.

- 4.2.1 What does BMI stand for? (2)
- 4.2.2 What do you call a point that lies a distance away from all the other points in a data set, as seen with point C above? (2)
- 4.2.3 Name the type of graph used above. (2)
- 4.2.4 Write down the weight of the team member that is 120 cm tall. (2)
- 4.2.5 Comment on the weight status of the person labelled B. (5)
- 4.2.6 What is the probability of selecting a person below 120 kg, who is shorter than 1,5 m? (3)  
Give your answer as a percentage, rounded to one decimal place.

[28]

## QUESTION 5

- 5.1 Mrs Xego, 58 years old, earns a gross salary of R46 523,16 per month. She contributes 7,5% of her gross salary toward a pension fund, and also pays an amount of R1 600 per month to a charity organisation. Both of these contributions are non-taxable.

TABLE 7 below shows the rates of tax that individuals in South Africa are liable to pay for the 2022/2023 tax year.

**TABLE 7: TAX RATES FOR INDIVIDUALS – 1 March 2022 to 28 February 2023**

RATES APPLICABLE TO INDIVIDUALS	
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
353 101 – 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

Age Category	Rebates	Tax threshold
* Below age 65	R16 425	R91 250
* Age 65 to below 75	R9 000	R141 250
* Age 75 and older	R2 997	R157 900

[Source: <https://www.sars.gov.za>]

Use the information in TABLE 7 above to answer the questions that follow.

- 5.1.1 Write out the full name of the organisation that is responsible for collecting tax in South Africa. (2)
- 5.1.2 Explain what the tax threshold amount refers to. (2)
- 5.1.3 Calculate Mrs Xego's annual taxable income. (4)
- 5.1.4 Mrs Xego's friend earns an annual taxable income of R502 185,60. She claims that she pays more than one quarter ( $\frac{1}{4}$ ) of her annual taxable income towards tax each year. (7)
- Verify, showing ALL calculations, whether her statement is valid or not.

- 5.2 Mrs Xego has researched requirements to relocate to New Zealand. She requires a skilled migrant visa, that costs NZ\$4 880, and her husband, who would like to start his own business, needs an entrepreneur resident visa, which costs NZ\$6 860. An entrepreneur is required to invest a capital amount of at least NZ\$500 000 in order to qualify for this visa.

The table below shows the exchange rates for 3 countries on 23 February 2023.

**TABLE 8: EXCHANGE RATES ON 23 FEBRUARY 2023**

<b>US dollar</b>	\$1	18,28 ZAR
<b>British pound</b>	£1	22,04 ZAR
<b>New Zealand dollar</b>	NZ\$0,088205	1 ZAR

[Adapted from [www.immigrationnewzealand](http://www.immigrationnewzealand)]

Use the information in TABLE 8 above to answer the questions that follow.

- 5.2.1 Determine the exchange rate of the New Zealand dollar (NZ\$) in terms of the South African Rand (ZAR) on the 23 February 2023, in the form NZ\$. (3)
- 5.2.2 Calculate the total cost of the visas (to the nearest R100) that Mrs Xego and her husband must pay, should they decide to relocate. (4)
- 5.2.3 Mr Xego's brother stays in America and has offered to lend the capital amount to him, at an interest rate of 8,75% compounded annually, over two years.

Calculate how many New Zealand dollars Mr Xego will have to repay to his brother after two years. (4)

**[26]**

**TOTAL: 150**

## ANNEXURE: QUESTION 3.1

TABLE 6 below gives a summary of retail trade sales for various retailers, for the period April 2022 to September 2022.

**TABLE 6: RETAIL TRADE SALES AT CURRENT PRICES BY TYPE OF RETAILER**  
(R MILLION)

TYPE OF RETAILER	APRIL 2022	MAY 2022	JUNE 2022	JULY 2022	AUG 2022	SEPT 2022
General dealers	42 716	47 459	47 609	43 677	48 319	49 220
Food, beverages, and tobacco in specialised stores	8 978	8 462	8 298	9 050	8 542	8 607
Pharmaceuticals and medical goods, cosmetics and toiletries	8 073	7 517	A	8 038	7 987	7 211
Textiles, clothing, footwear, and leather goods	16 994	16 903	15 055	15 255	14 135	14 013
Household furniture, appliances, and equipment	4 242	4 291	4 219	4 419	4 374	4 121
Hardware, paint, and glass	7 536	8 943	8 235	8 864	-----	8 959
All other retailers	9 963	9 866	9 331	9 036	9 114	8 982
<b>TOTAL</b>	<b>98 502</b>	<b>103 440</b>	<b>-----</b>	<b>98 339</b>	<b>101 447</b>	<b>101 113</b>

[Adapted from statssa]