NATIONAL
SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2023

MATHEMATICAL LITERACY P1
(DEAF)

MARKS: 150

TIME: 3 hours

This question paper has 14 pages, including 1 annexure.

INSTRUCTIONS AND INFORMATION

1.   This question paper has **FIVE questions.**
       Answer ALL the questions.

2.   **Use** the **ANNEXURE** to **answer QUESTION 3.1**.

3.   **Number** the **answers** the **same** as the numbers on the **question paper**.

4.   **Diagrams** are **NOT** drawn to **scale**.
       Some questions will **tell** you to **use the scale**.

5.   **Round off** ALL **final answers** to **fit** with the **content** of the question.

6.   **Write units** where needed.

7.   Start **EACH question** on a **NEW page**.

8.   **Show ALL calculations**.

9.   Write **neatly**.

QUESTION 1

1.1 | Olwethu wants to **open** a **bank account** and decides to **research various(different) 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

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

Please turn over

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
Total	**29 624 882**	**30 980 110**

[Adapted from Statista]

Use **TABLE 2**. **Answer** the **questions.**

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

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

1.2.3   **Determine** the p**ercentage** of the **female population represented(made up)** by **Black Africans**.   (3)

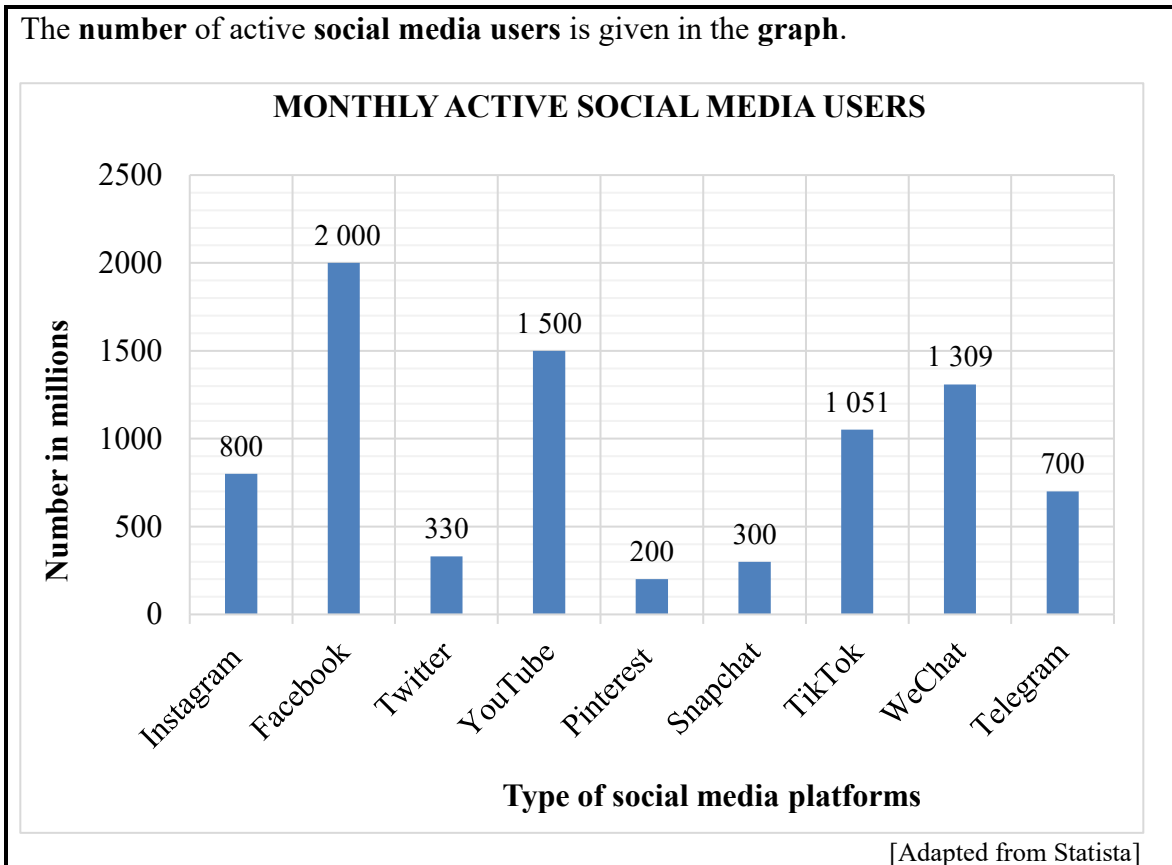1.2.4   Are the **population estimates data numerical** or **categorical**?   (2)

1.3 | A **clothing store** is having an **annual(yearly) 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.

Sale price R249,95

Sale price R135,95

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**.

MONTHLY ACTIVE SOCIAL MEDIA USERS

[Adapted from Statista]

Use the **graph**. **Answer** the **questions**.

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(show)** 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 is an **advertisement** for a **generator** that he **intends(plans)** to **buy**.

Ryobi 7,5 KVA 4-stroke key-start petrol generator

NOW R13 499

WAS R13 999 Save R500

The **company selling** this **generator** offers the **payment options** illustrated**(shown)** in TABLE 3.

TABLE 3: PAYMENT OPTIONS FOR RYOBI GENERATOR

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

Use **TABLE 3**. **Answer** the **questions**.

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**(prove)**, 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**(add) 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 **TABLE 4**. **Answer** the **questions**.

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

2.2.2　**Petrol 95 decreased**(became less) 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**(used)　　(4)

2.3　At the moment, 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 shows the Nelson Mandela Bay **regular tariffs** for normal water availability.
Also tariffs that are **applicable**(relevant) 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)**
Step 1	0 up to 0,3 kℓ	R20,81	R19,10
Step 2	More than 0,3 kℓ up to 0,5 kℓ	R31,80	R20,72
Step 3	More than 0,5 kℓ up to 0,8 kℓ	R63,60	R28,96
Step 4	More than 0,8 kℓ up to 1,0 kℓ	R106,00	R49,99
Step 5	More than 1,0 kℓ up to 1,6 kℓ	R159,00	R91,43
Step 6	More than 1,6 kℓ	R318,00	R121,90

VAT – Value Added Tax

[Adapted from NMB Municipality tariff book]

Use **TABLE 5**. **Answer** the **questions**.

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**(doing) **various surveys**. These **results** are **used** to e**stablish** 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 retailer** for the **period April 2022** to **September 2022**.

Use **TABLE 6**.
It is **on** the **ANNEXURE**.
Answer the **questions**.

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 off** 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**.
Round off your answer to **TWO decimal places**.   (2)

3.1.6   **Determine** the **percentage change** of the **total retail trade sales** between **April** and **September.**
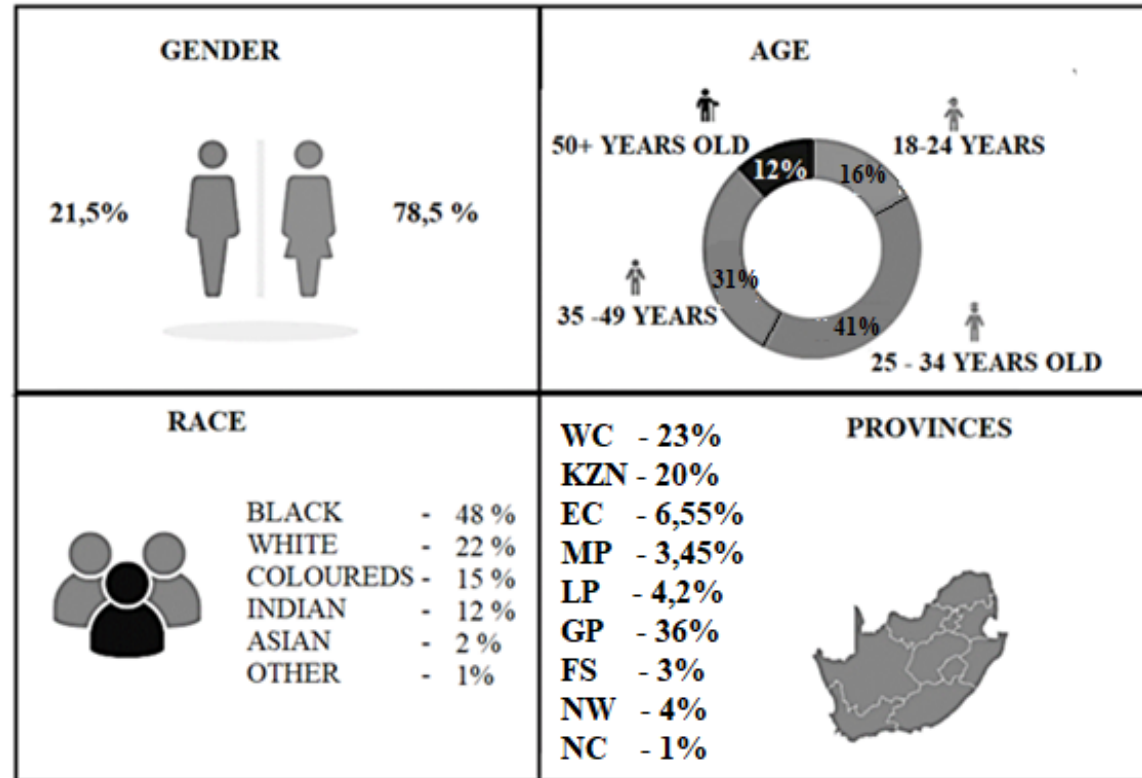
Use the **formula**:

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

3.1.7   **Calculate** the **probability**, as a **decimal fraction**, of **randomly selecting retail trade sales** for **less** than **R4 400 million**.
Round off your answer 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(show)** if they were **satisfied** with their **online shopping experience**.
Below are the **results** of the **survey**.

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

GENDER	AGE
21,5% 78,5 %	50+ YEARS OLD 12% 16% 18-24 YEARS 35 -49 YEARS 31% 41% 25 - 34 YEARS OLD

RACE	PROVINCES
BLACK - 48 % WHITE - 22 % COLOUREDS - 15 % INDIAN - 12 % ASIAN - 2 % OTHER - 1%	WC - 23% KZN - 20% EC - 6,55% MP - 3,45% LP - 4,2% GP - 36% FS - 3% NW - 4% NC - 1%

[Adapted from marklives.com]

Use the **information**. **Answer** the **questions**.

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)

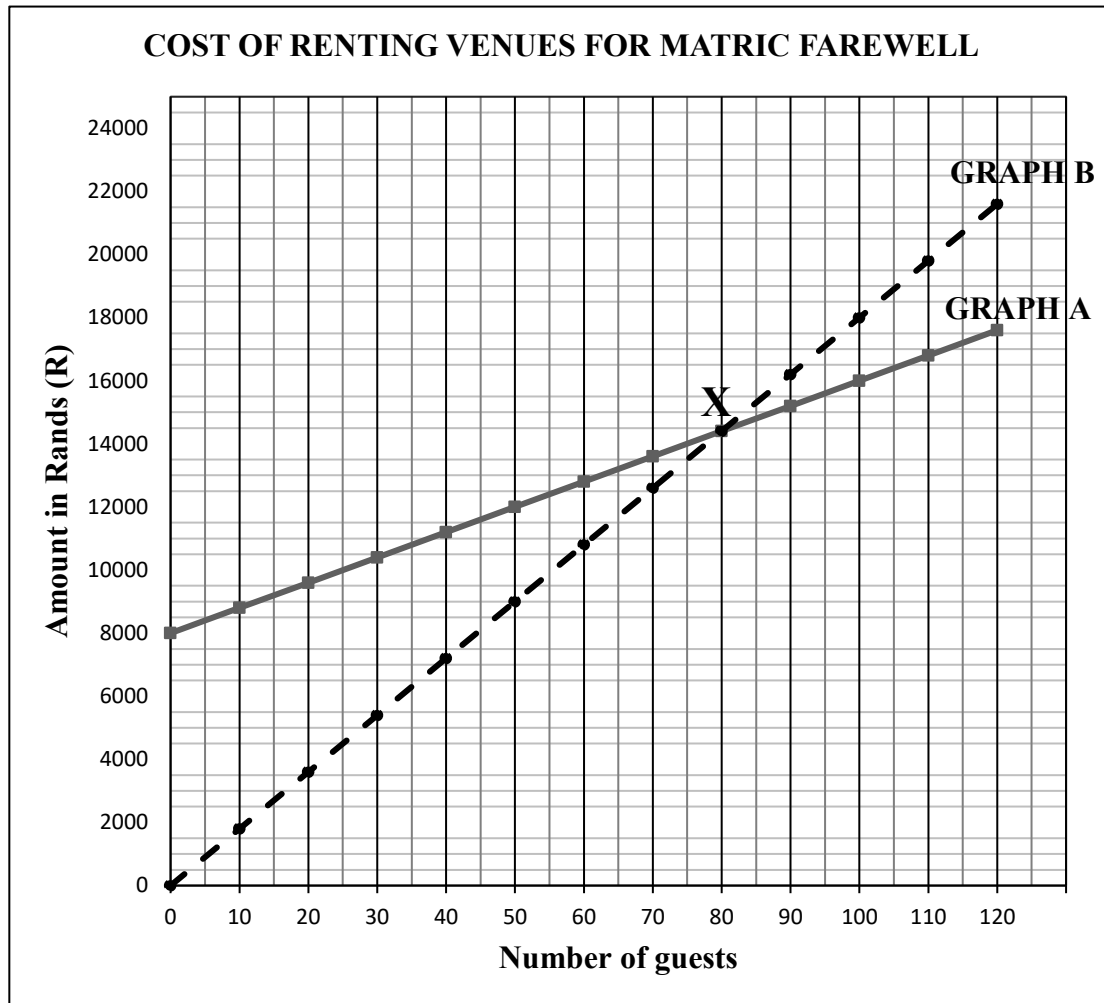3.2.3 **Calculate** the **interquartile range** for the **provincial satisfaction**.

Use the formula: **IQR = Q₃ – Q₁** (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**.

Venue 1 – Charges a fixed rental fee of R8 000 and an additional fee of R80,00 per person.
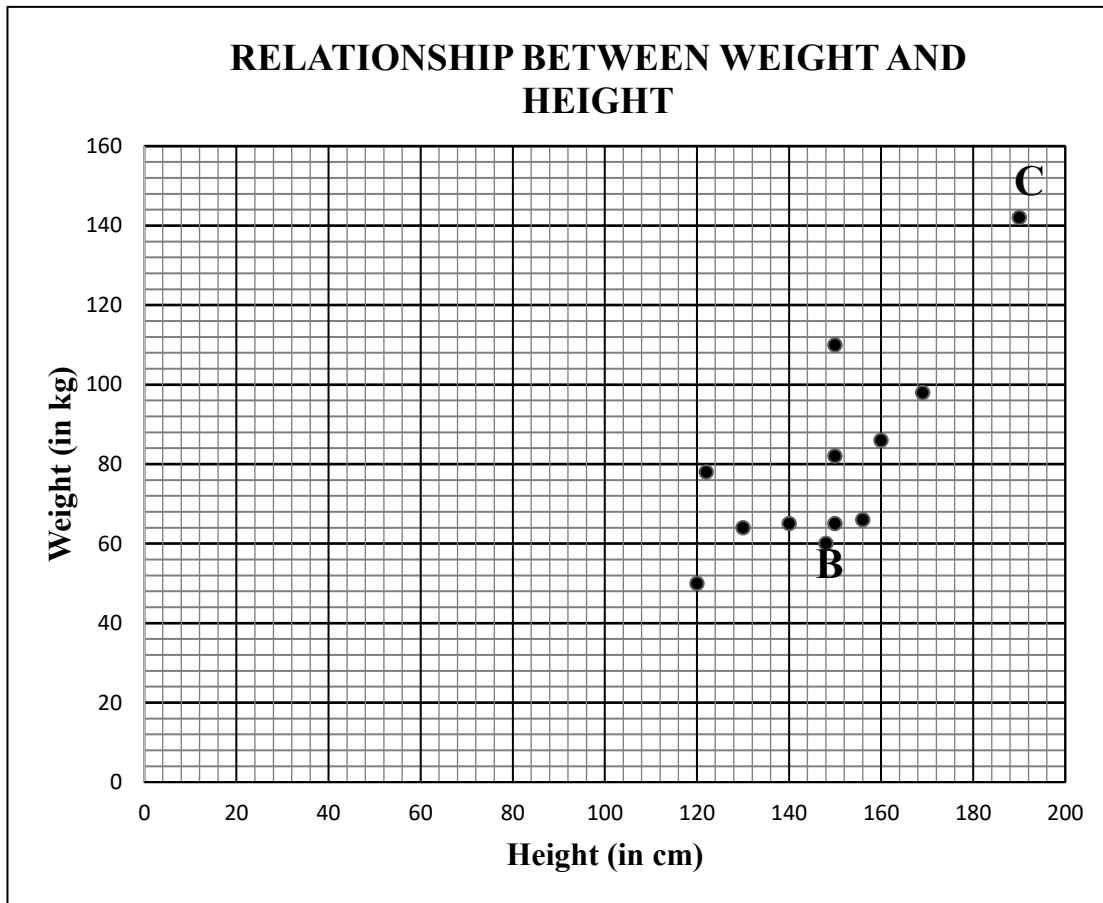
Venue 2 – Charges a rate of R180,00 per person.

COST OF RENTING VENUES FOR MATRIC FAREWELL

Use the **information**. **Answer** the **questions**.

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 e**quation** 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(decided)** to go with **Venue 2**.
Say if it is **correct**, **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.**

RELATIONSHIP BETWEEN WEIGHT AND HEIGHT

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

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

Use the **information**. **Answer** the **questions**.

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?
Give your **answer** as a **percentage**, rounded off to **ONE decimal place**.   (3)

[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**.
She 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(responsible) 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 **TABLE 7**. **Answer** the **questions.**

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 (¼)** of her **annual**(yearly) taxable income t**owards tax each year.**

Say if it is **correct**, showing **ALL calculations**, whether her **statement** is **valid** or **not**.   (7)

5.2 | Mrs Xego has **researched requirements** to **relocate** to **New Zealand**.
She **requires(needs)** 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 e**ntrepreneur** is **required** to **invest** a **capital amount** of at least NZ$500 000 in order to qualify for this visa.

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

TABLE 8: EXCHANGE RATES ON 23 FEBRUARY 2023

US dollar	$1	18,28 ZAR
British pound	£1	22,04 ZAR
New Zealand dollar	NZ$0,088205	1 ZAR

[Adapted from www.immigrationnewzealand]

Use **TABLE 8**. **Answer** the **questions**.

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(yearly),** 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**.

TABEL 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
TOTAL	**98 502**	**103 440**	-----	**98 339**	**101 447**	**101 113**

[Adapted from statssa]