GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# JUNE EXAMINATION
# GRADE 12

# 2024

## MATHEMATICAL LITERACY

## (PAPER 1)

MATHEMATICAL LITERACY P1

C2601E

**TIME:** 2 hours

**MARKS:** 100

**11 pages + an addendum of 6 pages**

X05

## INSTRUCTIONS AND INFORMATION

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

2. Use the ANNEXURES in the ADDENDUM as follows:

   - Use ANNEXURE A for QUESTION 2.2.1, 2.2.2 and 2.2.3
   - Use ANNEXURE B for QUESTION 2.2.4
   - Use ANNEXURE C for QUESTION 3.1
   - Use ANNEXURE D for QUESTION 3.2
   - Use ANNEXURE E for QUESTION 3.3

3. Number your answers correctly according to the numbering system used in this question paper.

4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

5. Show ALL calculations clearly.

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

7. Indicate units of measurement, where applicable.

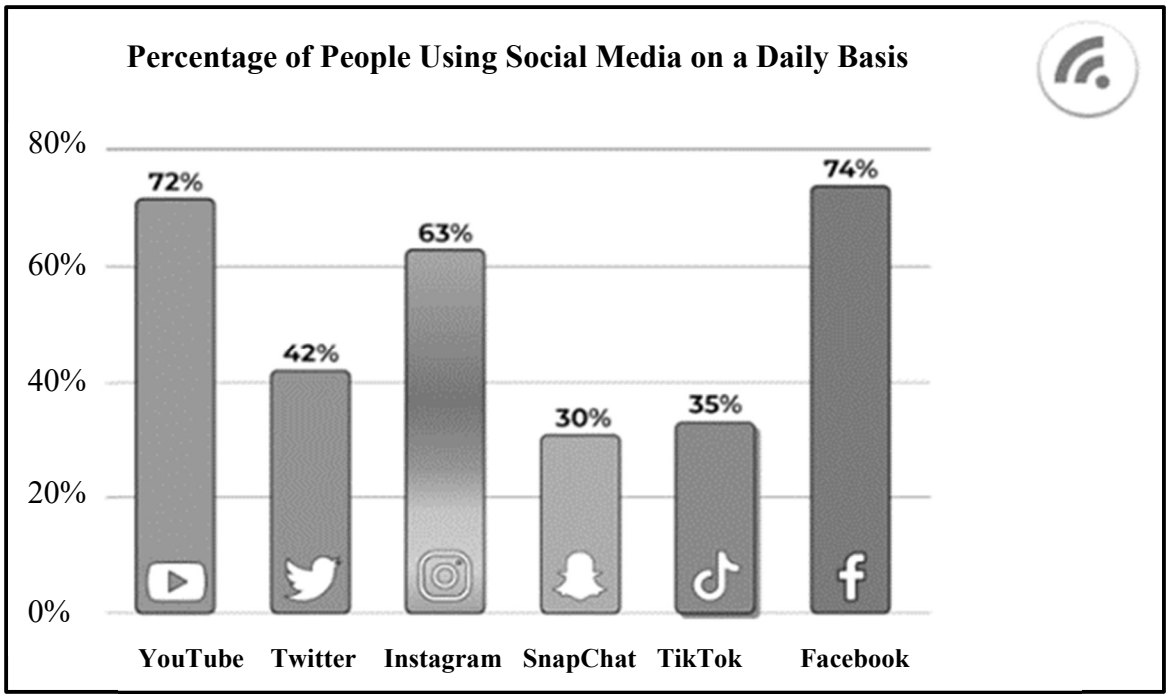
8. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

9. Start EACH question on a NEW page.

10. Write neatly and legibly.

## QUESTION 1

1.1 Social media is a collective term for websites and applications (Apps) that focus on communication, community-based input, interaction, content-sharing and collaboration. People use social media to stay in touch and interact with friends, family and various communities.




**[Source: Stats South Africa]**

Use the graph above to answer the questions that follow.

1.1.1 Identify the type of graph indicated above. (2)

1.1.2 Name the social media platform that is the least popular. (2)

1.1.3 Determine the percentage of Instagram users. (2)

1.1.4 There are 10 million users daily on social media platforms. Calculate how many users are on TikTok daily. (2)

1.2 When buying a car, the generally accepted rule of thumb is that you should not spend more than 20% of your total income on car payments.




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

Mr Clain is looking at his dream car, a Golf GTI 2023 model.

Mr Clain earns a monthly gross salary of R68 000.

The price of the car is calculated as follows:

| | |
|---|---|
| Retail Price | R834 900 |
| Deposit | R0 |
| Trade-in Value | R0 |
| Residual/Balloon payment | 0% |
| Monthly Repayment | R16 760 |
| Total Interest | **A** |
| Total Estimated Repayment | R1 206 711 |
| Repayment Period (Months) | 72 |
| Estimated Interest rate | 13% |

**NOTE:** Mr Clain does not want to trade in his current car.

Use the information above to answer the questions that follow.

1.2.1 Write the total estimated repayment value out in words. (2)

1.2.2 Choose the correct answer from the options below. Write only the letter (A – D) as an answer.

The correct definition for *interest rate* is …

A the money paid on the borrowed amount.

B the price you pay to borrow money.

C the amount you pay back, thus the original amount you borrowed plus a certain percentage of the loan amount as interest.

D the total amount in rands you pay back for a loan. (2)

1.2.3 Calculate 20% of Mr Clains' monthly gross salary. (2)

1.2.4 What is the original selling price of the car without the interest? (2)

1.2.5 Determine the value of **A**, the total amount of interest payable on the GTI Golf. (2)

1.2.6 Write down the repayment period in years. (2)
**[20]**

**QUESTION 2**

2.1 Mr Randy Ford moved from the USA to South Africa and was appointed as an Head of Department for Mathematical Literacy and Mathematics at Zoonodle High School in Johannesburg. Below is an extract of his salary slip.

## Salary Advice

Zoonodle High School
21023 Pearson Point Road
Gate Avenue
Johannesburg

| | | | | | |
|---|---|---|---|---|---|
| Date of Joining | : | 2022-06-23 | Employee Name | : | Randy Ford |
| Pay Period | : | August 2023 | Designation | : | HOD |
| Worked Days | : | 26 | Department | : | Mathematics |

| Earnings | Amount | Deductions | Amount |
|---|---|---|---|
| Basic Pay | 39 380,75 | Tax RSA PAYE | 8 496,32 |
| Home allowance | 1 691,38 | Care4 Medical Aid | 1 701,00 |
| | | Employee 1 701 | |
| | | Member fee 4 027 | |
| | | Home loan | 15 250,00 |
| | | | |
| | | | |
| | Gross Income | 41 072,13 Total Deductions | **A** |
| | | Net Pay | **B** |

Use the salary slip above to answer the questions that follow.

2.1.1 Explain the meaning of *PAYE* as seen in context of the salary slip above. (2)

2.1.2 Show by means of calculations how the gross income of R41 072,13 has been determined. (2)

2.1.3 Calculate the value for **A**, Mr Ford's Total Deductions. (2)

2.1.4 Mr Ford informed his wife that he will have a net salary of R15 625,81.

Verify with calculations whether Mr Ford is correct. Write a formula for calculating the net salary to assist you in your calculations. (3)

2.1.5 Calculate what percentage is paid by the employee towards medical aid. Round-off your answer to the nearest percentage. (3)

2.2 One of the major sources of revenue for the government is personal income tax. Mr Ford does extra work after hours not necessarily shown on his salary advice and submits his tax returns via SARS e-filing. ANNEXURE A shows an extract of Mr Ford's e-filing calculations.

2.2.1 Determine the total amount of income assessed by SARS for Mr Ford after all allowances and extra remunerations have been considered. Use ANNEXURE A to answer the question. (2)

2.2.2 Use ANNEXURE A and identify Mr Ford's taxable income after the assessment calculation. (2)

2.2.3 The e-filing calculations on ANNEXURE A show a value of R4 163,70 as the CALCULATED result. Show by means of calculations how the amount was calculated and explain whether this amount is to be paid to SARS, or if this amount should be paid to Mr Ford. (6)

2.2.4 According to the assessment done on e-filing, it is apparent that Mr Ford needs to pay R149 996,92 on his taxable income before rebates. Make use of the tax table for 2023 on ANNEXURE B and verify whether this amount is correctly calculated. (3)

2.3 Mr Ford is a homeowner and receives a monthly water bill.

The City of Ekurhuleni will provide free basic wastewater services per month. The following rates will apply.

| Tariff Summary | Tariff R/kl 2022/23 | Tariff R/kl 2023/24 |
|---|---|---|
| Number of residential units × (0 – 6 kℓ/month) | R16,18 | R18,12 |
| Number of residential units × (7 – 15 kℓ/month) | R26,66 | R29,86 |
| Number of residential units × (16 – 30 kℓ/month) | R32,66 | R36,58 |
| Number of residential units × (31 – 45 kℓ/month) | R40,64 | R45,52 |
| Number of residential units × (46 kℓ or more/month) | R50,11 | R56,12 |
| **All tariffs include 15% VAT.** | | |

**[Source: Tariffs, City of Ekurhuleni]**

2.3.1 Determine the tariff in R/kℓ for 15 kℓ of water usage per month in 2023/2024. (2)

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## ADDENDUM

**6 pages**

**ANNEXURE A**

**QUESTION 2.2.1, 2.2.2 and 2.2.3**

**TABLE 1:**

| | |
|---|---|
| SARS | **INCOME TAX**<br>**TAX CALCULATOR RESULT**<br><br>Details<br>Reference number: 835041121578<br>Year of assessment: 2023<br>Date: 20231020 |

| Amount Assessed | | |
|---|---|---|
| **Code** | **Source Code Description** | **Rand** |
| 3601 | INCOME – TAXABLE | 433 064,00 |
| 3605 | ANNUAL PAYMENT – TAXABLE | 36 176,00 |
| 3713 | OTHER ALLOWANCES – TAXABLE | 127 198,00 |
| 3817 | PENSION FUND CONTRIBUTIONS – DC | 70 199,00 |
| 3702 | RE-IMBURSIVE TRAVEL ALLOWANCE – TAX | 33 245,00 |
| 3810 | MEDICAL SCHEME FEES FRINGE-BENEFIT | 19 838,00 |
| | TOTAL | 719 720,00 |
| **Deductions** | | |
| **Code** | **Source Code Description** | **Rand** |
| 4014 | TRAVEL EXPENSES – FIXED COST | 33 245,00 |
| 4029 | RETIREMENT FUND CONTRIBUTIONS | 102 678,00 |
| | TOTAL | 135 923,00 |
| Taxable income | | 583 797,00 |
| Rating percentage (%) | | 0,00 |
| Rating amount | | 583 797,00 |
| Taxable income – Subject to retirement fund lump sum benefit tax rates | | 0,00 |
| Taxable income – Subject to retirement fund lump sum withdrawal benefit tax rates | | 0,00 |
| Tax calculation | | |
| Normal tax on taxable income | | 149 996,92 |
| Rebates | | 16 425,00 |
| Additional tax | | 0,00 |
| Subtotal | | 133 571,92 |
| Employees tax and tax credits | | 129 408,22 |
| Calculated result | | 4 163,70 |

**[Source: IRP5 *www.sars.gov.za*]**

**ANNEXURE B**

**QUESTION 2.2.4**

**TABLE 2: 2022/2023 TAX YEAR (1 March 2022 – 28 February 2023)**

| | ANNUAL TAXABLE INCOME (R) | TARIFFS OF TAX (R) |
|---|---|---|
| A | 1 – 226 000 | 18% of taxable income |
| B | 226 001 – 353 100 | 40 680 + 26% of taxable income above 226 000 |
| C | 353 101 – 488 700 | 73 726 + 31% of taxable income above 353 101 |
| D | 488 701 – 641 400 | 115 762 + 36% of taxable income above 488 700 |
| E | 641 401 – 817 600 | 170 734 + 39% of taxable income above 641 400 |
| F | 817 601 – 1 731 600 | 239 452 + 41% of taxable income above 817 600 |
| G | 1 731 601 and above | 614 192 + 45% of taxable income above 1 731 600 |

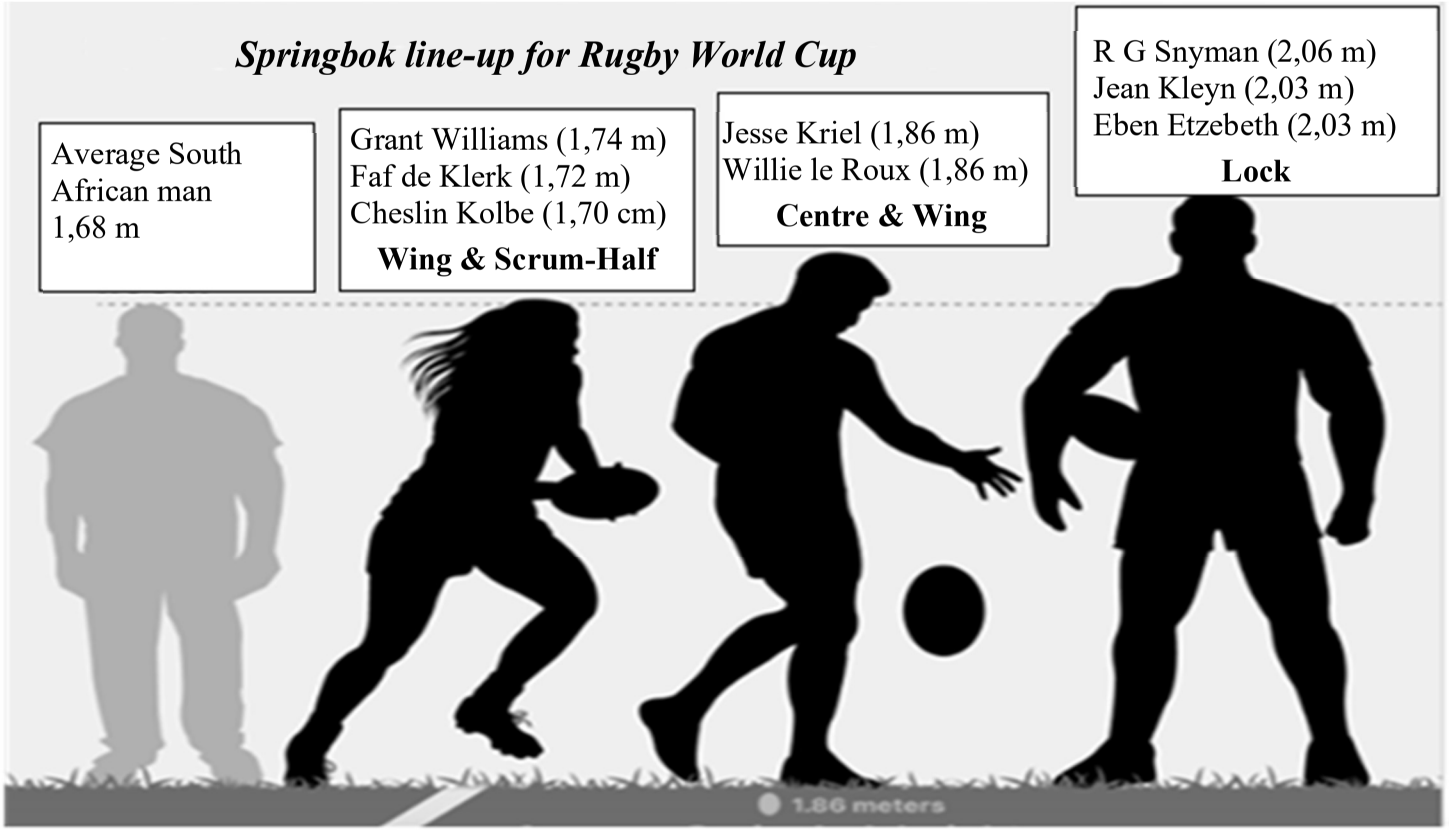
| TAX REBATE | TAX YEAR | | |
|---|---|---|---|
| | 2022/23 | 2021/22 | 2020/21 |
| Primary | R16 425 | R15 714 | R14 958 |
| Secondary (65 years and older) | R9 000 | R8 613 | R8 199 |
| Tertiary (75 years and older) | R2 997 | R2 871 | R2 736 |

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

**ANNEXURE C**

**QUESTION 3.1**

## HEIGHT OF THE AVERAGE SOUTH AFRICAN MAN COMPARED TO HEIGHT OF PLAYERS IN THE SPRINGBOK TEAM



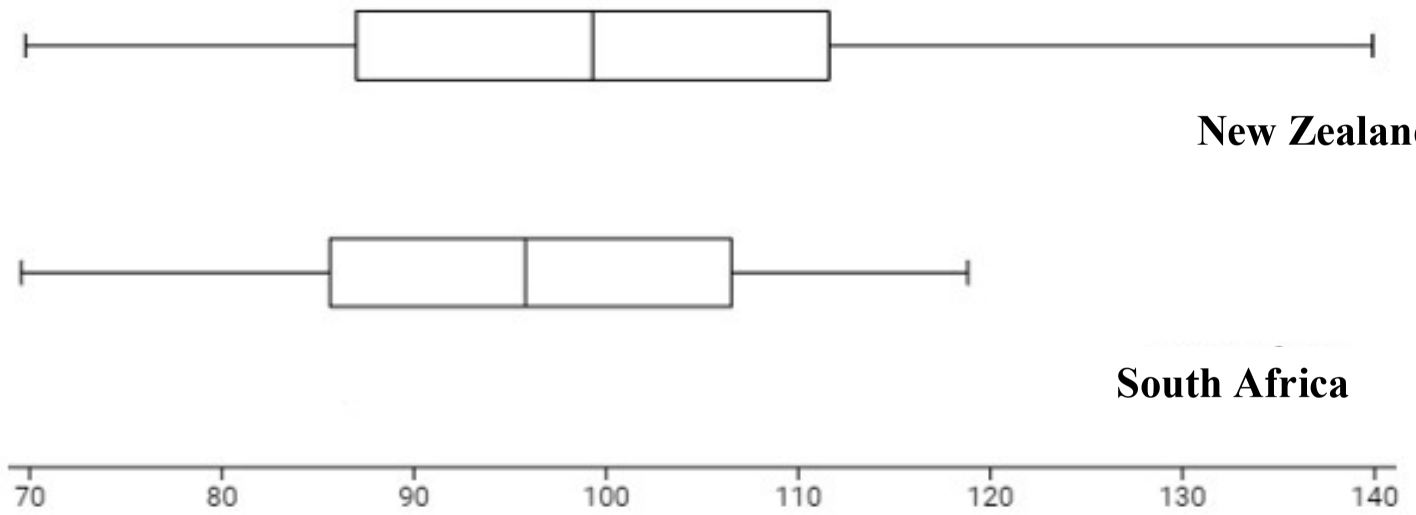

The **average height** of the Springbok Squad in 2023 is **1,86 m**.

**[Source: Rugby Mag.co.za]**

**ANNEXURE D**

**QUESTION 3.2**

**COMPARISON OF THE WEIGHT OF THE NEW ZEALAND AND SOUTH AFRICAN RUGBY PLAYERS**




**[Source: Outlier Africa]**

**ANNEXURE E**

**QUESTION 3.3**

Salary difference between world famous soccer players versus world famous rugby players.

| Cristiano Ronaldo | Neymar Junior |
|---|---|
| €35 000 000 PER YEAR | €37 000 000 PER YEAR |



**ANNUAL SALARIES OF WORLD FAMOUS RUGBY PLAYERS (IN MILLIONS)**

| Name of player | Nationality | Amount earned in million rand per annum |
|---|---|---|
| Dan Carter | NZ | R20,13 |
| Matt Giteau | AUS | R20,13 |
| Siya Kolisi | SA | R35,00 |
| Faf de Klerk | SA | R21,00 |
| Cheslin Kolbe | SA | R22,00 |

**[Source: Outlier Africa]**

**Current exchange rate:**

1 Euro = 20,05 South African Rand

1 (US) Dollar = 18,36 South African Rand

**[Source: *www.x-rates.com*]**

2.3.2 Calculate the percentage increase for water tariffs from 2022/2023 to 2023/2024, if a household uses approximately 30 kℓ of water per month.

You may use the formula:

$$\textbf{Percentage increase} = \frac{Tariff\ 2024 - Tariff\ 2023}{Tariff\ 2023} \times 100\%$$ (3)

2.3.3 Mr Ford made a comment in 2023, after calculating the percentage increase as indicated, that he will pay R300 more for using 35 kℓ of water in 2024. Verify his statement by showing all calculations. (6)

**[36]**

**QUESTION 3**

3.1 With its fourth Rugby World Cup victory, South Africa stands at the top of the ranking list.

Commitment to the cause. Confidence to do a job. Belief in the system. This is the South African way. It has won South Africa the 2023 Men's Rugby World Cup.




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

ANNEXURE C shows the height of an average South African man and the rugby players with their positions in the team, as well as their respective heights.

Use ANNEXURE C and answer the questions that follow.

3.1.1 Determine the height range with regard to the rugby players used in this set of data. (3)

3.1.2 The average height of a South African rugby player is 1,86 m. Use the following formula and determine the total height, in metres, of the 15 rugby players in the Springbok squad.

$$\text{Mean} = \frac{\text{total height}}{\text{total number of players in the squad}}$$ (4)

3.2 Rugby is arguably one of the most body-type inclusive sports. Unlike long-distance running, or bodybuilding, whatever shape you are, there is a place for you on the rugby field.

ANNEXURE D shows two box and whisker diagrams comparing the weight of the New Zealand and South African rugby teams.

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

3.2.1 The 5-point summary for New Zealand is as follow:

| Q3 | Max | Q1 | Min | Q2 |
|---|---|---|---|---|
| 113 kg | 140 kg | **A** | 70 kg | 100 kg |

If the interquartile range is equal to 25 kg, determine the value for **A** = Quartile 1. (4)

3.2.2 Which ONE of the following terms best describes the data displayed in the box and whisker diagram:

Discreet data **OR** Continuous data

Give a reason for your answer. (3)

3.2.3 The box and whisker diagrams compare the weight between the New Zealand and South African rugby players.

What **term** is used to define a value that is very far apart from other values. (2)

3.3 According to international statistics, there is a great difference between salaries paid to soccer players and rugby players.

ANNEXURE E shows information on the salaries paid to famous rugby players and soccer players in different currencies.

Use the information in ANNEXURE E to answer the following questions.

3.3.1 Neymar Junior and Cristiano Ronaldo are two of the most famous players in the world of football.

Convert Cristiano Ronaldo's yearly salary to rand. (2)

3.3.2 Determine the median annual salary, in millions, of the given 5 world-famous rugby players provided. (3)

3.3.3 Write down the annual salary of Ronaldo to the annual salary of Siya Kolisi in ratio form and simplify it as **... : 1**

Hence, explain the meaning of the calculated ratio. (3)
**[24]**

**QUESTION 4**

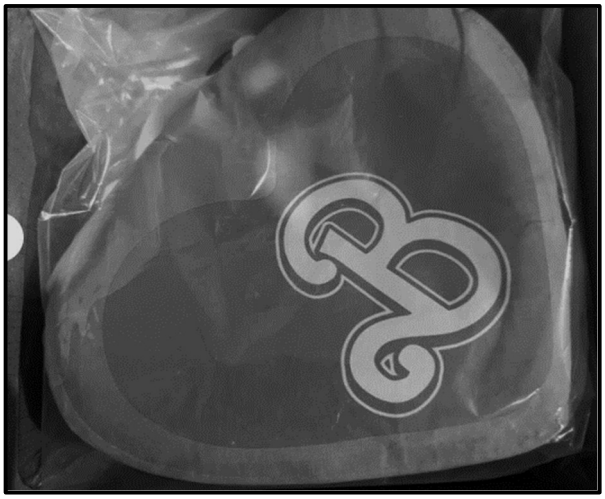
4.1 Pink power: Barbie movie breaks record merchandise sell-outs.

The Barbie movie shattered this year's box office records in its opening weekend with $125 million in ticket sales. The film had a $145 million budget backed by Warner Bros. and Mattel.

Even before the movie was released merchandise sold out, for example Barbie tumblers at $19,99 and the Barbie blanket in a bag at $22,99. These merchandise items are currently on backorder until June 2024 and are now selling on eBay for around $77 and $125 respectively.




**Barbie tumbler @ $77 on eBay**



**Barbie blanket purse/bag @ $125 on eBay**

4.1.1 (a) Write a formula for profit in the given context. (2)

(b) Determine the amount of profit in rand made by eBay users selling the Barbie blanket in a bag for $125 per blanket

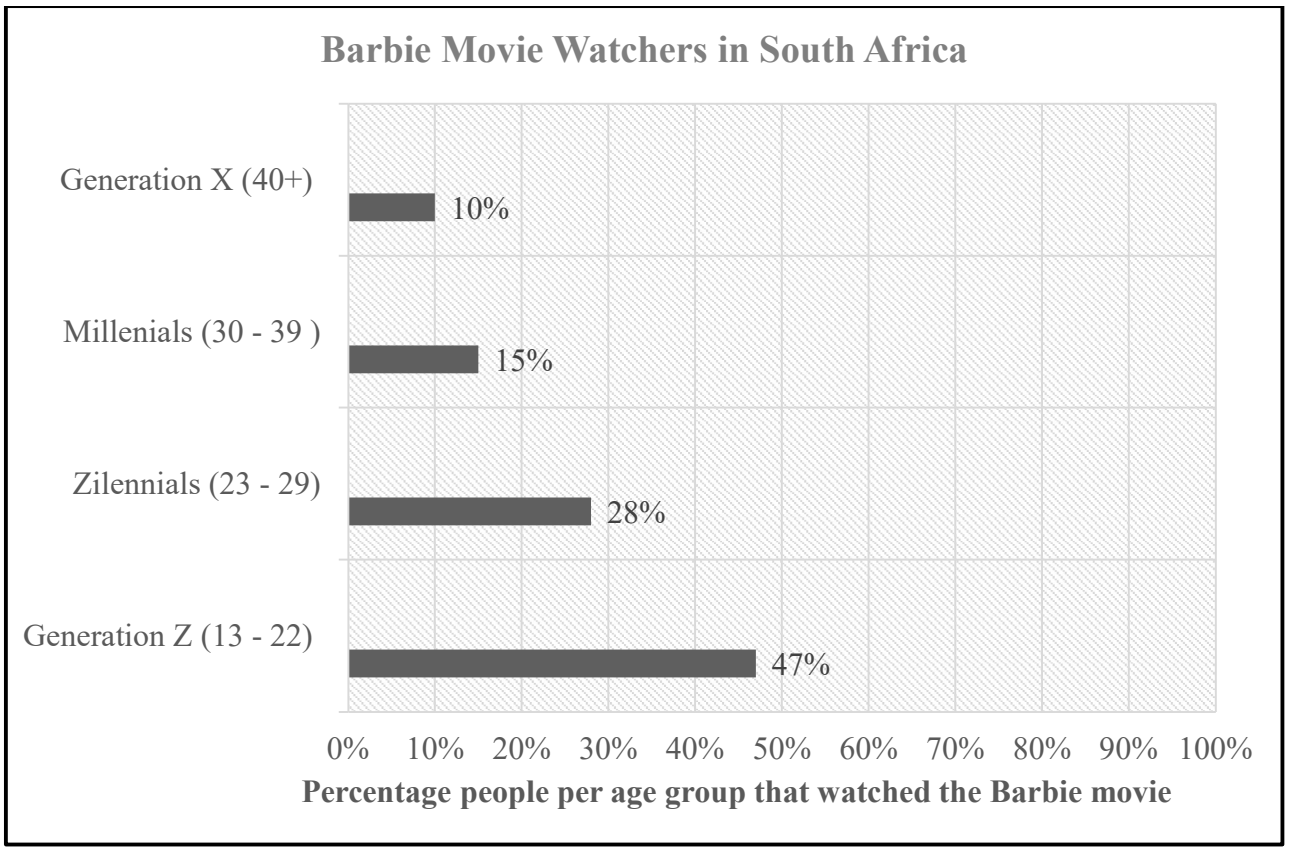
**NOTE:** The exchange rate is currently $1 = R18,36. (2)

4.1.2 Verify with calculations, that if the Barbie movie made a revenue of $125 million worldwide during the opening weekend, with a profit margin of 60%, the expenses for the opening weekend amounted to $50 million.

You may use the following formula:

$$\textbf{Profit margin} = \frac{Revenue - Expense}{Revenue} \times 100\%$$ (5)

4.2 The graph below indicates the age groups that watched the Barbie movie.




**[Source: *www.people.com*]**

Use the graph above to answer the questions that follow.

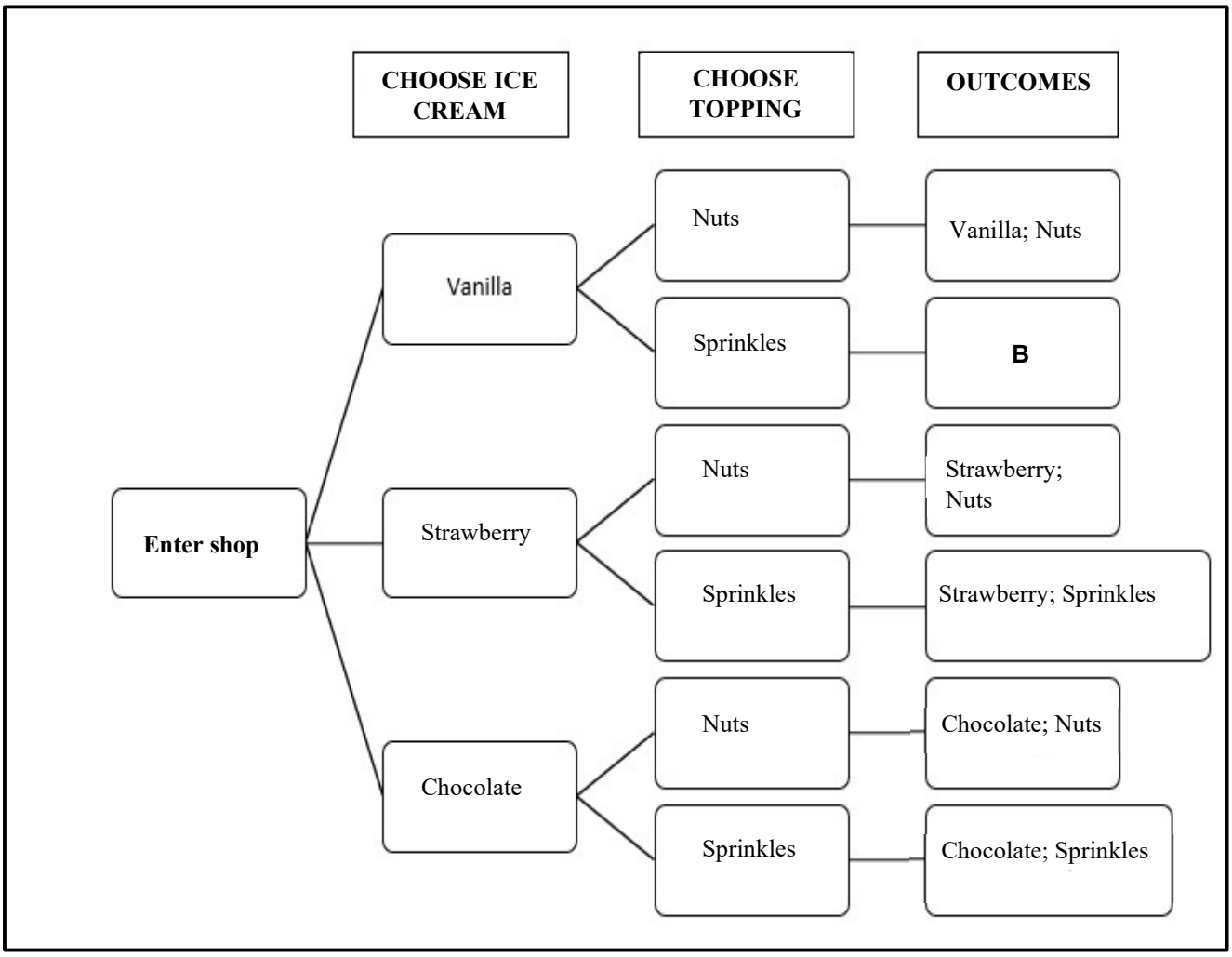
4.2.1 The Gen Z population in South Africa is estimated to be 21 000 000 people. Of these, 47% watched the Barbie movie at an estimated cost of R75 per ticket for a regular 2D movie.

Calculate the total gross income made from the Gen Z population in South Africa. (4)

4.2.2 What is the probability of a 2-year-old going to the movies to watch the popular Barbie movie? (2)

4.3 At the movies you have the option to buy ice cream before watching the Barbie Movie.

Below is a tree diagram illustrating flavours with toppings and possible outcomes.




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

4.3.1 Write the possible outcome for **B**. (2)

4.3.2 Write down the probability, as a decimal fraction, that you will choose chocolate ice cream with nuts. Round-off your answer to two decimal places. (3)

**[20]**

**TOTAL: 100**