KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

# NATIONAL SENIOR CERTIFICATE

## GRADE 12

## MATHEMATICAL LITERACY P1

## PREPARATORY EXAMINATION

## SEPTEMBER 2023




**MARKS: 150**

**TIME: 3 hours**

Stanmorephysics

**This question paper consists of 13 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 3.1
   - 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 Economic hardships have been on the rise for South Africans. Comparing prices of basic grocery items has become the norm. Given below are prices of basic grocery items from different stores.

**TABLE 1: PRICE BREAKDOWN OF FOOD ITEMS FROM DIFFERENT STORES**

| Item | Checkers | Pick n Pay | Spar | Woolworths | Shoprite | Food Lovers |
|---|---|---|---|---|---|---|
| Bread | R 18,99 | R 18,99 | R 20,99 | R 18,99 | R 18,99 | R 19,45 |
| Sunflower oil | R 89,99 | R 94,99 | R109,99 | R 93,99 | R 89,99 | R 84,99 |
| Maize meal | R 36,99 | R 42,99 | R 34,99 | R 35,99 | R 36,99 | R 34,99 |
| White sugar | R 53,99 | R 53,99 | R 56,99 | R 49,99 | R 53,99 | R 54,99 |
| Milk | R 29,99 | R 29,99 | R 36,99 | R 34,99 | R 28,99 | R 29,99 |
| Rice | R 36,99 | R 37,99 | R 38,99 | R 37,99 | R 36,99 | R 36,99 |
| Flour | R 39,99 | R 41,99 | R 49,99 | R 39,99 | R 39,99 | R 39,99 |
| Soap | R 16,99 | R 12,99 | R 16,99 | R 15,99 | R 16,99 | R 17,99 |
| Toilet paper | R 84,99 | R 84,99 | R 74,99 | R 78,99 | R 69,99 | R 69,99 |
| **TOTAL** | **R408,91** | **R418,91** | **A** | **R406,91** | **R392,91** | **R389,37** |

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

Use TABLE 1 above to answer the questions that follow.

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

1.1.2 Write down the modal price for milk. (2)

1.1.3 Identify the minimum price for soap. (2)

1.1.4 Calculate the missing value **A**, the total for Spar. (2)

1.1.5 Determine the difference between the highest and lowest price for sunflower oil. (2)

1.1.6 Name the store that was the cheapest for all the items above. (2)

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1.2 Maranatha Computer College wants to upgrade its CCTV (Closed Circuit Television) in its premises. Given below is one of the quotations for the installation from Tiger Security.

**TABLE 2: QUOTATION FROM TIGER SECURITY**

| **Account** | **Your Reference** | **Tax Exempt** | **Tax Reference** | **Sales Code** | **Expiry Date** |
|---|---|---|---|---|---|
| MCC006 | UPGRADE CCTV | N | | | 16/01/2023 |

| **Code** | **Description** | **Quantity** | **Unit Price (R)** | **Tax (R)** | **Net Price (R)** |
|---|---|---|---|---|---|
| C006 | Hik analogue 1080p bullet | 16 | … | 1 440,00 | 11 040,00 |
| C40 | 16 ch Acusense Hik DVR | 1 | 6 386,00 | 832,96 | 6 386,00 |
| C032 | 4tb SV Rated SATH HDD | 1 | 1 899,00 | 247,70 | 1 899,00 |
| 134 | 9 way PSU with 7 ah battery | 5 | 1 420,00 | 926,09 | 7 100,00 |
| I008 | Cabling and sundries 500m | 1 | 3 990,00 | 520,43 | 3 990,00 |
| C061 | Baluns | 32 | 45,39 | 189,45 | 1 452,48 |
| C009 | Labour | 16 | 300,00 | 626,09 | 4 800,00 |
| C070 | Camera mounting box | 24 | 65,57 | 205,26 | 1 573,68 |
| F004 | Conduiting 16mm x 25mm | 1 | 37 690,00 | 4 916,09 | 37 690,00 |

| | | |
|---|---|---|
| 50% deposit is required on confirmation of quote.<br>Balance due on invoice.<br>Received in good order. | Sub Total | 66 027,09 |
| | Discount @ 0,00% | 0,00 |
| | Amount Excl. 15% Tax | 66 027,09 |
| | Tax | 9 904,06 |
| Signed: _____ Date: _____ | TOTAL | **75 931,15** |

[Extracted from TIGER SECURITY CC]

Use TABLE 2 to answer the questions that follow.

1.2.1 Explain what is meant by *quotation* in the given context. (2)

1.2.2 Calculate the unit price for Hik analogue 1080p bullet. (2)

1.2.3 Write down, to the nearest ten cents, the total cost of the quotation. (2)

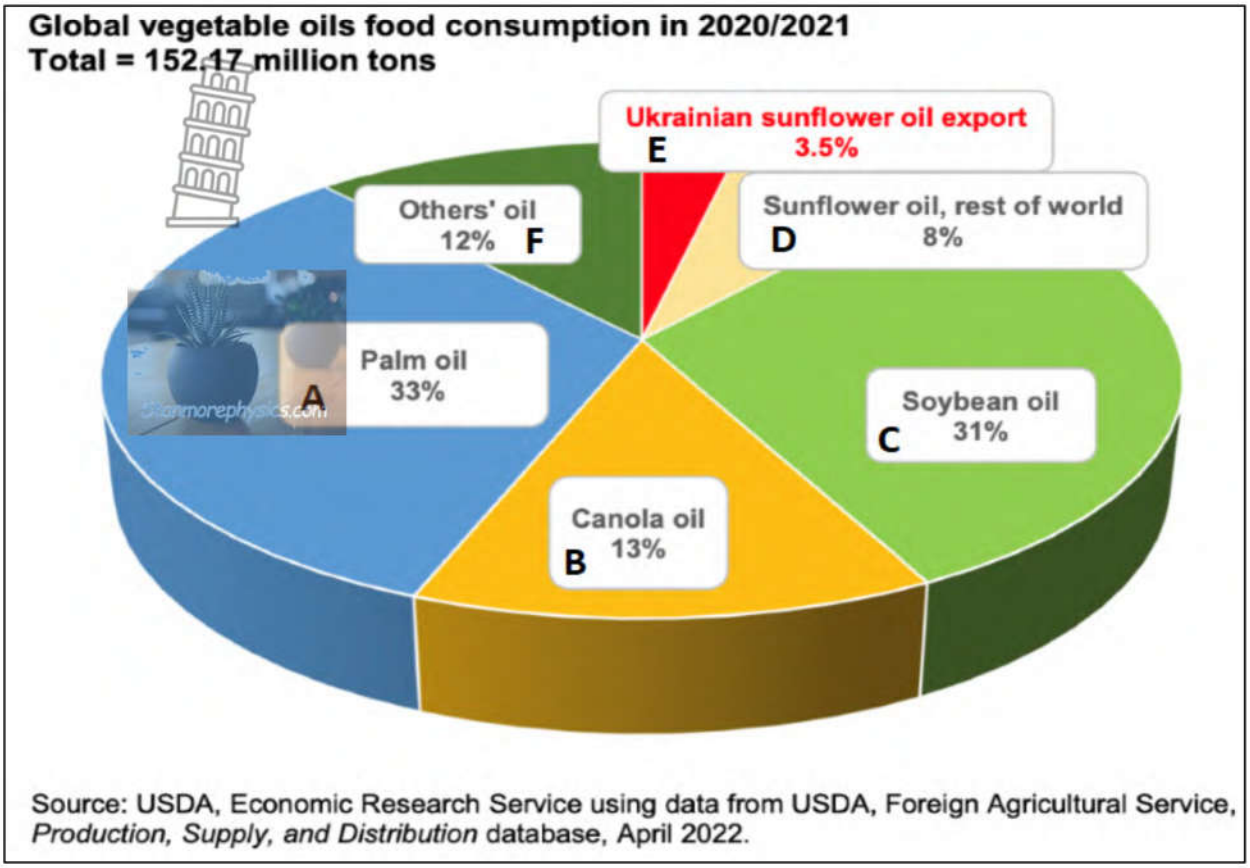
1.2.4 Show how the tax amount of R9 904,06 was determined. (2)

1.2.5 If Maranatha Computer College decides to accept the quotation above, calculate the deposit the college will have to pay. (2)

1.2.6 Calculate the cost per metre for cabling and sundries. (2)

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1.3 The graph below shows the global oils food consumption in 2020/2021. Total consumption was 152,17 million tons.




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

1.3.1 Name the type of graph drawn above. (2)

1.3.2 Arrange, in descending order, the percentage of oils consumed in 2020/2021. (2)

1.3.3 Write 152,17 million as a number in full. (2)

**[30]**

## QUESTION 2

2.1 Mr. G Ngwane received his clothing account statement from Truworths. ANNEXURE A shows an extract of his clothing account statement.

Use ANNEXURE A to answer the questions that follow.

2.1.1 Define the term *credit* in the given context. (2)

2.1.2 Write down the payment due date. (2)

2.1.3 Use the balance brought forward and transactions to show how the balance amount of R14 170,66 was determined. (3)

2.1.4 Calculate (rounded off to ONE decimal place) the interest as a percentage of the amount due on the statement. (3)

2.2 Mr. Ngwane's son Nkosi holds a valid Private Pilot License and he wants to get a Commercial Pilot's License.
Given below is the minimum flight time and the rate per hour.

**N.B: A minimum of 200 hours total flight time, this includes:**

- 100 hours PIC flight time by day at R1 725 per hour.
- 5 hours PIC flight time by night at R1 725 per hour.
- 50 hours of cross country flying as PIC at R1 725 per hour.
- 40 hours dual (with an instructor) instrument time broken down as follows:
  *20 hours on Flight and Navigation Procedures Training at R945 per hour.
  *20 hours dual (with an instructor) on PA28 – 161IF at R2 025 per hour.
- 5 hours dual (with an instructor) on AC50 at a total cost of R19 750.

**PIC (Pilot in Command) flight - the trainee is responsible for the operation of the plane.**

[Adapted from www.uni24.co.za]

Use the information above to answer the questions that follow.

2.2.1 Calculate the rate per hour for 5 hours dual on AC50. (2)

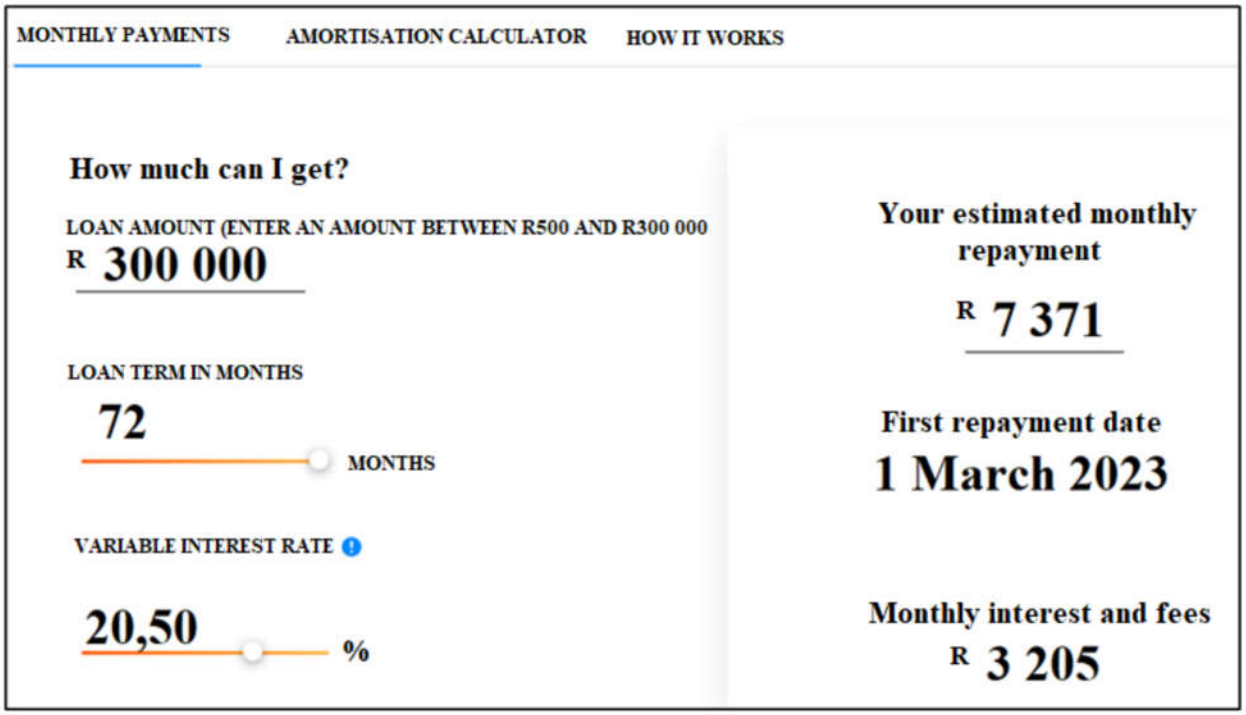
2.2.2 Nkosi claims that the total flight cost for the minimum 200 hours total flight time will not exceed R346 500. Use calculations to verify his claim. (4)

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2.3 Mr Ngwane used Standard Bank online loan calculator to check what the monthly repayment will be on a loan of R300 000 to assist Nkosi with Commercial Pilot's License fees.

The bank charges a once off initiation fee of R1 207,50 which is not part of the monthly repayment and a monthly service fee (included in the monthly repayment) of R69.

Given below is the Standard Bank calculator output.




[Adapted from www.standardbank.co.za]

Use the information above to answer the questions that follow.

2.3.1 Calculate the real cost of the loan.

You may use the formula:
**Real cost of loan = Monthly repayment × Loan period + Initiation fee** (2)

2.3.2 Show how the monthly interest and fees amount of R3 205 was calculated.
**N.B: Banks normally round up this amount to the nearest one rand.**

You may use the formula:
**Total Interest = Total Monthly Repayments − Loan amount** (5)

2.3.3 Nkosi's sister works and lives in Canada and would like to send him Canadian dollars (CAD) equivalent to R50 000.

Use the exchange rate of **R1 = 0,0737862 CAD** to calculate the amount in Canadian dollars the sister has to send. (3)

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2.4 Mr Ngwane designs and makes bedroom and bathroom mirrors to supplement his income. He works from home after work and on Sundays.

**TABLE 3: SK MIRRORS TOTAL COST AND TOTAL INCOME**

| **Number of mirrors** | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| **Total Cost (R)** | 1500 | 2190 | 2880 | 3570 | **B** | 4950 | 5640 |
| **Total Income (R)** | 0 | 1065 | 2130 | 3195 | 4260 | 5325 | 6390 |

**N.B: Each mirror is sold for R1 065**



Use TABLE 3 and the information above to answer the questions that follow.

2.4.1 Write down a formula to determine the Total Cost of making mirrors. (4)

2.4.2 Calculate the missing value **B** in TABLE 3. (2)

2.4.3 Write down the co-ordinates of the break-even point. (2)

2.4.4 Define the term *break-even point* according to the given context. (2)

**[36]**

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## QUESTION 3

3.1 "**Big trouble for private schools in South Africa**" is an article published on 30 January 2023 by Business Tech. A survey was conducted to determine the percentage of parents who could afford to pay school fees in full. ANNEXURE B shows a graph of the findings of the survey that was conducted.

Use ANNEXURE B to answer the questions that follow.

3.1.1 Define the term *Survey* in the given context. (2)

3.1.2 Name ONE data collection instrument that could be used to collect the data on ANNEXURE B. (2)

3.1.3 By the end of 2020, the fourth quarter, just 56% of parents were able to afford school fees. Some private schools stated that the fourth quarter mean percentage for the period 2016 to 2022 will be less than 64%.

Verify, showing ALL calculations, whether this statement is valid. (5)

3.1.4 Write down the year which experienced the lowest percentage of parents being able to afford school fees and suggest one possible reason for this lowest percentage. (2)

3.1.5 If there were about 198 200 parents who sent their children to private schools in 2020, calculate (rounded off to the nearest whole number) the number of parents that were able to pay school fees in full by the end of the third quarter of 2020. (3)

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3.2 Children in South Africa live under different household living conditions. Some of these living conditions and statistics are shown in TABLE 4 below.

**TABLE 4 : HOUSEHOLD LIVING CONDITIONS FACED BY CHILDREN - 2018**

| PROVINCE | Children population 2018 ('000) | Children living in households without an employed adult (%) | Children experiencing hunger ('000) | Children experiencing hunger (%) | Children in public schools who benefit from school feeding (%) | Areas where fear of crime prevent children from going to parks (%) |
|---|---|---|---|---|---|---|
| WC | 1 971 | 8% | 288 | 15% | 54% | 47% |
| EC | 2 514 | 46% | 212 | 9% | 90% | 38% |
| NC | 436 | 29% | 73 | 17% | 83% | 57% |
| FS | 1 021 | 35% | 131 | 13% | 80% | 35% |
| KZN | 4 184 | 36% | 826 | 20% | 84% | 28% |
| NW | 1 382 | 35% | 284 | 21% | 80% | 21% |
| GP | 4 186 | 15% | 345 | 8% | 55% | 46% |
| MP | 1 673 | 29% | 222 | 13% | 88% | 39% |
| LM | 2 374 | 41% | 118 | 5% | 91% | 15% |
| **Total** | **19 741** | **30%** | **2500** | **13%** | **77%** | **35%** |

**[Adapted from www.resep.sun.ac.za]**

Use TABLE 4 above to answer the questions that follow.

3.2.1 Calculate the children population range (as a number in full) for the 9 provinces. (2)

3.2.2 Arrange in ascending order, the percentages of areas where crime prevents children from going to parks. (2)

3.2.3 Use your answer in 3.2.2 to identify the province that will be used to determine Quartile 2 ($Q_2$). (2)

3.2.4 State which province has the highest percentage of children experiencing hunger. (2)

**[22]**

## QUESTION 4

4.1 Mr. Parker, aged 44, earns a monthly basic salary of R74 800. He has a Medical Aid that covers himself, his wife and their 3 children. The following deductions are made from his salary.

- **Pay As You Earn** (PAYE)
- **UIF**
- **Medical Aid**
- **Pension Fund** (7,5% of basic salary)
- **Donation of R5 000 to an Orphanage**

**N.B: UIF deduction for persons earning taxable income that is R17 712 or more per month is 1% of R17 712 or R177,12 per month.**

**TABLE 5: INCOME TAX TABLES – 2023/2024**

| **Taxable Income (R)** | **Rates of Tax** |
|---|---|
| R0 – R 237 100 | 18% of each R1 |
| R237 101 – R 370 500 | R 42 678 + 26% of the amount above R 237 100 |
| R370 501 – R 512 800 | R 77 362 + 31% of the amount above R 370 500 |
| R512 801 – R 673 000 | R121 475 + 36% of the amount above R 512 800 |
| R673 001 – R 857 900 | R179 147 + 39% of the amount above R 673 000 |
| R857 901 – R1 817 000 | R251 258 + 41% of the amount above R 857 900 |
| R1 817 001 and above | R644 489 + 45% of the amount above R1 817 000 |

| **Tax Rebate** | | **Tax Thresholds** | |
|---|---|---|---|
| Primary | R17 235 | Under 65 | R 95 750 |
| Secondary (65 and older) | R 9 444 | 65 and older | R148 217 |
| Tertiary (75 and older) | R 3 145 | 75 and older | R165 689 |

| **Medical Tax Credits** | **Amount per month** |
|---|---|
| Principal member | R364 |
| First dependent | R364 |
| Each additional dependent | R246 |

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

Use the information above and TABLE 5 to answer the questions that follow.

4.1.1 Write down the amount that is deducted every month for UIF. (2)

4.1.2 Calculate Mr. Parker's annual pension fund deduction. (3)

4.1.3 Mr. Parker's pension fund and donation contributions are allowable tax deductions.

Calculate his annual taxable income.

You may use the formula:
**Monthly taxable income = Basic salary − Pension fund − Donation** (3)

4.1.4 Calculate Mr. Parker's annual Medical Tax Credits. (3)

4.1.5 Mr. Parker claims that if he had no medical, he would be paying R1 466 more on a monthly basis to SARS.
Verify, showing ALL calculations, if his claim is valid. (7)

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4.2 The Minister of Finance, in his 2023 budget speech, introduced a Solar Panel Tax Incentive for individuals.

Individuals will be able to claim a rebate to the value of 25% of the new and unused solar photovoltaic (PV) panels, up to a maximum of R15 000 per individual. Only solar PV panels with a minimum capacity of 275W per panel (designed output) qualify for the rebate.

Mr. Parker bought 4 sets of 2-piece solar panels at R6 999,00 for each 2-piece from Takealot.




[**Adapted from www.takealot.com**]

Use the information above to answer the questions that follow.

4.2.1 Calculate the total cost of the solar panels. (2)

4.2.2 Use your answer in 4.2.1 to determine the solar rebate Mr. Parker is entitled to. (2)

4.2.3 Mr. Parker stated that his monthly income tax decreased to R14 605,02 after claiming the solar rebate. Verify, showing ALL calculations, whether Mr. Parker's statement is valid. (5)

4.3 Load shedding has been a problem since 2014, with the situation worsening thereafter. ANNEXURE C shows the number of calendar days on which rolling blackouts occurred and the number of hours the average consumer was disconnected from the grid during 2022.

Use ANNEXURE C to answer the questions that follow.

4.3.1 State one of the misleading characteristics of the two charts on ANNEXURE C. (2)

4.3.2 Nothando, a grade 12 Mathematical Literacy learner, claims that in 2022 an average consumer experienced 3,56 hours of power disconnection per day.

Use the information on ANNEXURE C to verify her claim. (4)

**[33]**

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## QUESTION 5

5.1 Bluegrass Academy is a high school with 1 400 learners. The school collected data on the number of learners who travel to school by car, by foot and by bicycle and the information was summarised in the form of a two-way table shown below.

| | CAR | FOOT | BICYCLE | TOTAL |
|---|---|---|---|---|
| **BOYS** | 90 | 215 | 35 | 340 |
| **GIRLS** | 160 | 320 | **D** | 490 |
| **TOTAL** | **C** | 535 | 45 | 830 |

**[Adapted from Bluegrass Academy]**

Use the information above to answer the questions that follow.

5.1.1 Calculate the missing values **C** and **D**. (4)

5.1.2 Calculate the probability of randomly choosing a girl who travels to school by car. Write your answer as a percentage, rounded off to 2 decimal places. (3)

5.2 Mrs. Dunn has 3-year-old twins, a boy and a girl. She has been monitoring their growth using the Growth Chart for boys and girls shown in ANNEXURE D.

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

5.2.1 Calculate the difference between the weights (at 30 months) of the twins at the $50^{th}$ percentile. (3)

5.2.2 At 30 months, Mrs. Dunn's daughter had her weight on the $25^{th}$ percentile. Explain what this means. (2)

5.2.3 Calculate the BMI for her son who is 3 years old, with a length (in cm) in the $25^{th}$ percentile and weighs 16,6 kg. Give your answer in $\mathbf{kg/m^2}$.

You may use the formula:

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

(4)

5.3 Mrs Dunn managed to save R50 000 as part of R80 000 deposit for a new car. Her parents are willing to give her a loan of R30 000 to be paid back with interest at the end of 12 months at 8,4% p.a interest compounded quarterly.

Use the information above to answer the following questions.

5.3.1 Calculate the quarterly interest rate. (2)

5.3.2 Manually calculate the total amount of money she will be owing her parents by the third quarter. (6)

5.3.3 Calculate the difference in the total amount paid to the parents if the parents charged Mrs Dunn 8,4% per annum simple interest on the loan. (5)

**[29]**

**TOTAL MARKS: [150]**

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# NATIONAL SENIOR CERTIFICATE

## GRADE 12

## MATHEMATICAL LITERACY P1

## PREPARATORY EXAMINATION

## ADDENDUM

## SEPTEMBER 2023

**This addendum consists of 5 pages with 4 annexures.**

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**ANNEXURE A**

**QUESTION 2.1**

Truworths Limited CIPC Reg. no. 1940/013923/06
Truworths is a registered credit provider no. NCRCP45

**STATEMENT**

**TRUWORTHS**

**MR G NGWANE**
**PRIVATE BAG X108**
**EMPANGENI**

**3880**

| DATE: 11 December 2022 | |
|---|---|
| YOUR ACCOUNT NUMBER | |
| 10100********* | |
| ACCOUNT LIMIT | YOU CAN BUY FOR |
| R13 150,00 | R0,00 |
| ARREARS | INSTALLMENT |
| R0,00 | R1 271,57 |

**Your amount due is R1 271,57**

**Statements are accepted as correct unless queried in 60 days.**

**YOUR BALANCE BROUGHT FORWARD** **R10 825,30**

| DATE | TRANSACTIONS | | DEBITS/CREDITS |
|---|---|---|---|
| 14 November 2022 | DO- 644 | Payment - Thank You | 1 100,00 CR |
| | | **6 MONTHS INTEREST FREE** | |
| | | Closing Plan Balance | 91,57 |
| | | **12 MONTHS - INTEREST BEARING** | |
| 28 November 2022 | 1029376 | Empangeni | 899,00 |
| 07 December 2022 | 1017211 | Gift Card Purchase | 1 000,00 |
| 10 December 2022 | 1021061 | Empangeni | 1 930,00 |
| 10 December 2022 | 2010055 | E-Commerce Web Store | 205,00 |
| 10 December 2022 | 2019951 | E-Commerce Web Store | 199,00 |
| 12 December 2022 | | Interest | 212,36 |
| | | Closing Plan Balance | 14 079,09 |
| | | **BALANCE AS AT 11 DECEMBER 2022** | **R14 170,66** |

**PAYMENT DUE DATE: 04 January 2023** **AMOUNT DUE** **R1 271,57**

**PAYMENT METHODS**

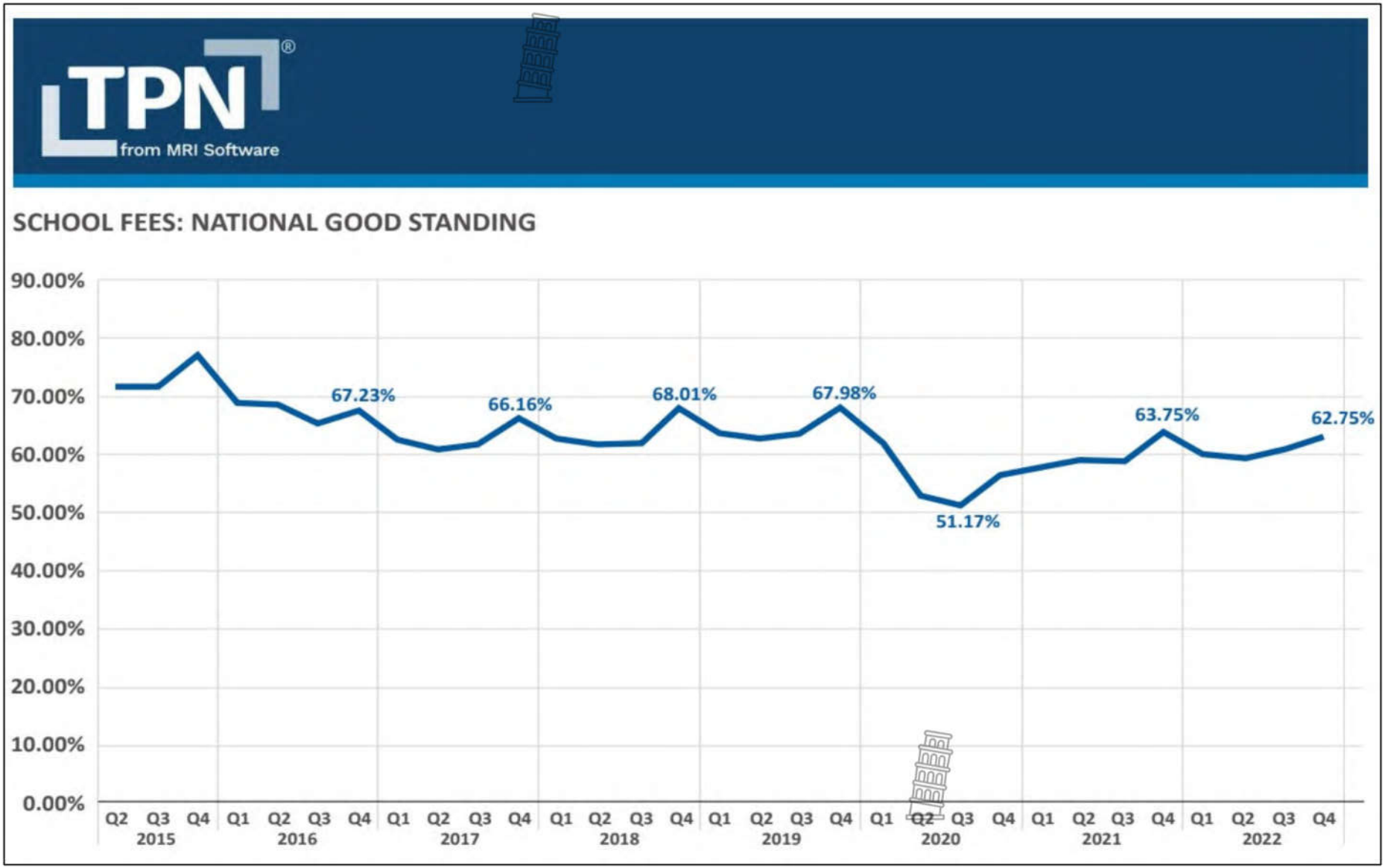
1. Pay online with a cheque or credit card.
2. ATM or Electronic Funds Transfer (EFT).
3. Pay at any Truworths store

**[Adapted from Ngwane Account Statement]**

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**ANNEXURE B**

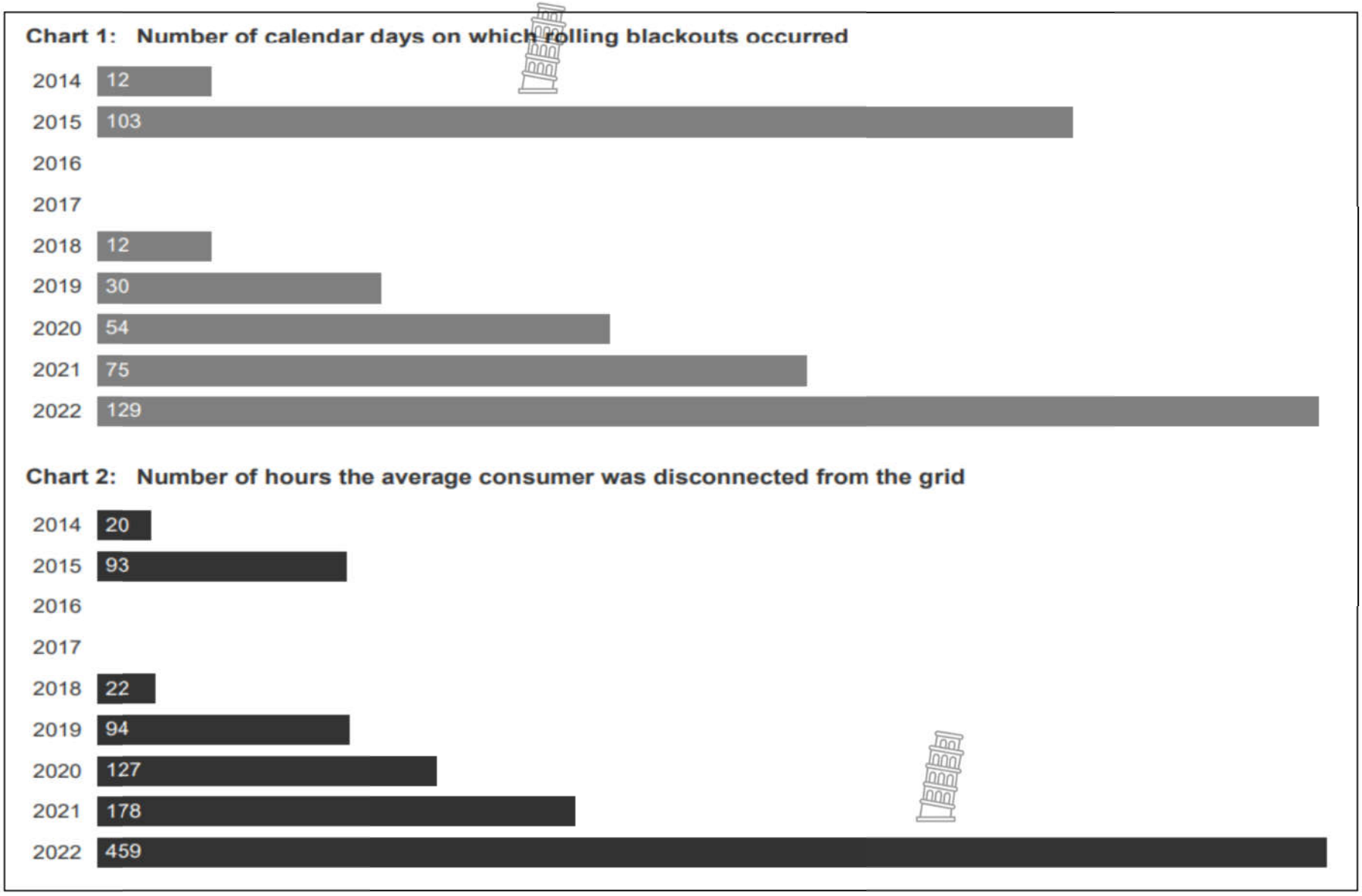
**QUESTION 3.1**




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**ANNEXURE C**




**Source: http://businesstech.co.za/news/**

## ANNEXURE D

## QUESTION 5.2

