Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 11

NOVEMBER 2023

MATHEMATICAL LITERACY P1

MARKS: **100**

TIME: **2 hours**

This question paper consists of 10 pages including an answer sheet.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2. Use the ANSWER SHEET to answer QUESTION 4.1.4.
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 David runs a small motorcycle service business from home. Given below is the budget drawn up by him for the new month.

INCOME	AMOUNT	EXPENSES	AMOUNT
26 Motorcycle services	R33 150	Detergents	R375
25 Car washes	R1 625	Motorcycle parts	…
		Water	R850,25
		Other	R1 500
TOTAL INCOME	**…**	**TOTAL EXPENSES**	R7 927,86

1.1.1 Calculate David's total income for the month. (2)

1.1.2 Determine the amount charged per motorcycle service. (2)

1.1.3 Calculate the amount spent on motorcycle parts. (2)

1.1.4 Calculate what percentage of total expenses David spends on water. (3)

1.2 TABLE 1 below shows the tollgate tariffs for the N1 road.

TABLE 1: N1 TOLLGATE TARIFFS

Tollgate (N1)	Class 1	Class 2	Class 3	Class 4
Huguenot – Main line	R44,50	R123,00	R193,00	R313,00
Vaal Plaza – Main line	R74,50	R140,00	R169,00	R225,00
Grasmere – Main line	R22,50	R67,00	R78,00	R103,00
– Ramp (N)	R11,50	R33,00	R39,00	R51,00
– Ramp (S)	R11,50	R33,00	R39,00	R51,00
Verkeerdevlei – Main line	R64,00	R128,00	R193,00	R271,00

VEHICLE CLASS APPLICABLE TO CONVENTIONAL TOLL PLAZAS		
CLASS 1	ALL LIGHT VEHICLES	
HEAVY VEHICLES		
CLASS 2	2 AXLES	
CLASS 3	3 AND 4 AXLES	
CLASS 4	5 OR MORE AXLES	

[Source: aa.co.za/toll-tariffs]

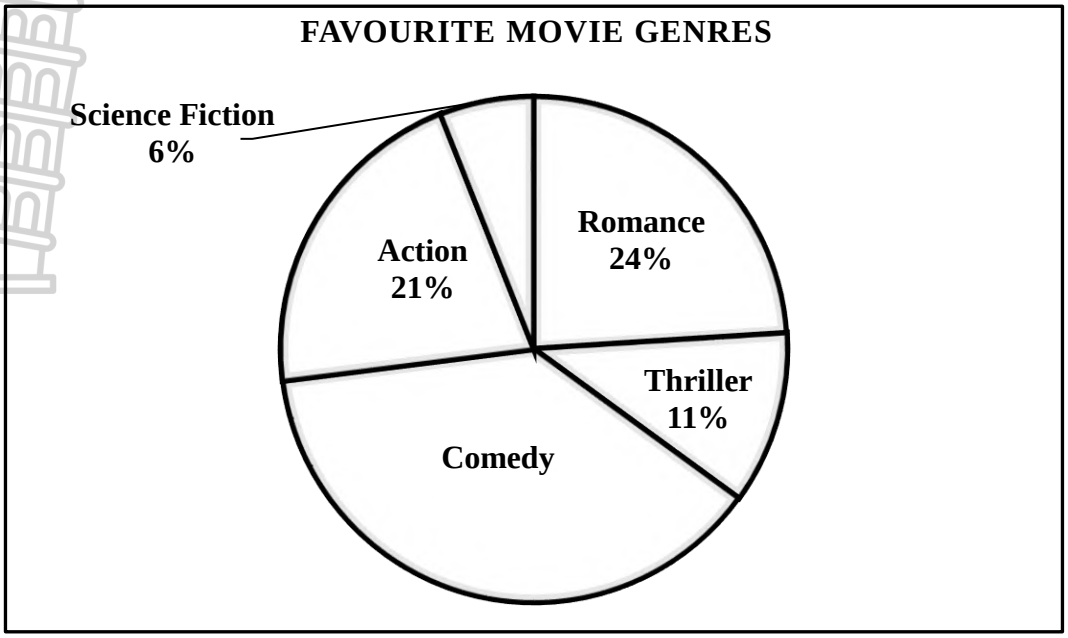
1.2.1 Determine the cost of travelling by car, towing a caravan, at the Grasmere Main line tollgate. (2)

1.2.2 If the cost of travelling by motorbike was R74,50, write down which tollgate was used. (2)

1.2.3 Write down the tariff for the Vaal Plaza, class 2 rates, as a simplified ratio to the class 4 rates of the same plaza. (2)

1.2.4 Calculate the cost of a return trip for a class 4 vehicle going through the Verkeerdevlei tollgate. (2)

1.3 The graph given below shows the favourite movie genres of a group of 220 students.



Use the above information to answer the questions that follow.

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

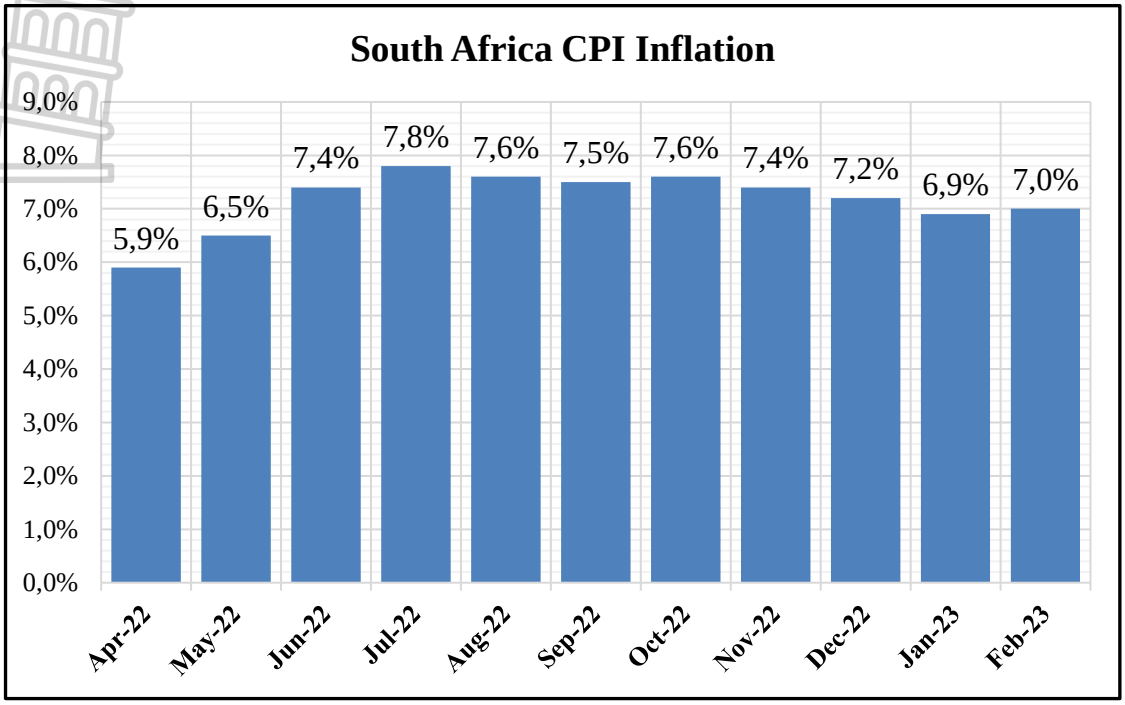
1.3.2 Calculate the percentage of students that prefer comedy. (2)

1.3.3 Determine the number of students that prefer romance movies. (2)

[23]

QUESTION 2

2.1 The graph given below shows South Africa's CPI inflation rate for the period April 2022 to February 2023.



[Source: tradingeconomics.com/statssa]

Use the above information to answer the questions that follow.

2.1.1 In December 2022 the price of a loaf of bread was R12,47. Calculate the price of a loaf of bread in February 2023. (5)

2.1.2 Did the price of goods increase or decrease from July 2022 to September 2022? Explain your answer. (2)

2.2 The invoice given below is for the installation of a water tank.

WATER TANKS 4 YOU		
Bill to: Mr T. Rock 1112 Flamingo Drive		Invoice number: 123 765 987 Invoice date: 22/04/2023
Description	**Unit Price**	**Amount**
1 x 5 000 ℓ Water tank	R5 499,00	R5 499,00
3 x Filters	R349,00	**A**
1 x Water pump	R1 699,00	R1 699,00
Labour	7,5 hours x …	R6 500,00
	SUBTOTAL	…
	15% VAT	…
	INVOICE TOTAL	…
*All payments due within 15 days of receipt of invoice.		

Use the above information to answer the questions that follow.

2.2.1 Give the day and month this invoice must be paid. (2)

2.2.2 Determine the total cost (rounded to the nearest thousand) of the filters. (3)

2.2.3 Calculate the cost per hour for labour. (2)

2.2.4 Calculate the total amount due, including VAT, for the above invoice. (3)

2.2.5 The price of the water tank is due to increase in the next month. The new price is expected to be R5 795,00. Mr Rock says that this increase is more than 5%.

Verify, showing ALL calculations, whether this statement is valid or not.

You may use the formula:

$$\textbf{\textit{Percentage change}} = \frac{\textit{Difference in cost}}{\textit{Original cost}} \times 100\%$$ (4)

2.3 Given in the table below are the electricity tariffs for domestic households.

BLOCKS	ELECTRICITY	RATE (c/kWh)
Block 1	0–600 kWh	229,00 c/kWh
Block 2	More than 600 kWh	278,46 c/kWh

Use the above information to answer the questions that follow.

Mr Rock and his family used a total of 712 kWh of electricity. Calculate the amount, in Rands, that he will pay for their electricity usage this month. (4)

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QUESTION 3

TABLE 2 below lists the winnings, endorsements and total net worth of the nine highest paid athletes in 2022. All values in the table are given in millions.

TABLE 2: TOP NINE HIGHEST PAID ATHLETES IN 2022

Name	Winnings (in millions)	Endorsements (in millions)	Total Net Worth (in millions)
Lionel Messi (soccer)	$75	$55	$130
Le Bron James (basketball)	$41,2	$80	$121,2
Cristiano Ronaldo (soccer)	$60	$55	$115
Neymar (soccer)	$70	$25	$95
Stephan Curry (soccer)	$45,8	$47	$92,8
Kevin Durant (soccer)	$42,1	$50	$92,1
Roger Federer (tennis)	---	$90	----
Canelo Alvarez (boxing)	$85	$5	$90
Tom Brady (football)	$31,9	$52	$83,9
TOTAL:			**B**

[Source: Wikipedia.org]

Use the above information to answer the questions that follow.

3.1 Write the winnings of Stephan Curry in words. (2)

3.2 Determine the median value of the endorsements of the nine players. (3)

3.3 Calculate the value of **B**, the total net worth of the nine players, if the total net worth of Roger Federer is $30,5 million dollars less than that of Le Bron James. (4)

3.4 Calculate the mean winnings for 2022. (3)

3.5 Express the endorsement amount of Cristiano Ronaldo as a percentage of his total net worth. (2)

3.6 Write down the winnings of Neymar as a simplified ratio to the total net worth of Canelo Alvarez. (2)

3.7 Determine the probability as a decimal fraction (rounded to THREE decimal places), of randomly selecting a player from the table above that plays any sport except soccer. (3)

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QUESTION 4

4.1 The choir committee of a high school have started a small business to raise funds for their upcoming tour. They make and sell curry bunnies with assistance from their parents.

They pay their parents R450 each month to cover costs for water and electricity. It costs them R10,00 to make one curry bunny.

TABLE 3 below shows their income and expenses for one month.

TABLE 3: CHOIR COMMITTEES MONTHLY INCOME AND EXPENSES

Number of curry bunnies	**0**	**10**	**20**	**50**	**100**	**150**	**200**
Expenses (in Rands)	450	550	650	950	1 450	1 950	2 450
Income (in Rands)	0	250	500	1 250	2 500	3 750	5 000

Use the above information to answer the questions that follow.

4.1.1 Identify the dependent and independent variables in the above context. (2)

4.1.2 Determine the selling price of ONE curry bunny. (2)

4.1.3 Write down the formula they will use to determine their total expenses. (2)

4.1.4 The graph drawn on the ANSWER SHEET shows the total income. On the same set of axes, draw a graph showing the TOTAL EXPENSES for the number of curry bunnies made in one month. (3)

4.1.5 The choir committee claims that if they sell 200 curry bunnies every month for four months, they will make more than R10 000 profit.

Verify, showing all calculations, whether their statement is valid or not. (4)

4.2 The frequency table below shows the number of motorists buying petrol on a specific day.

Time Interval	Frequency	Cumulative Frequency
06:00–08:59	12	12
09:00–11:59	8	20
12:00–14:59	13	**C**
D	17	50
18:00–20:59	23	73
21:00– 23:59	4	77

Use the above information to answer the questions that follow.

4.2.1 Determine the value of **C**. (2)

4.2.2 Give the time interval at **D**. (2)

4.2.3 Write down the modal time interval. (2)

4.2.4 Each motorist buys an average of 6,5ℓ of petrol on this day. If the price of petrol is R21,92 per litre, determine the total cost for the petrol bought on this day. (3)

4.2.5 What is the probability, as a fraction, of a motorist buying petrol before 12:00 on this day? (2)

4.3 Sethu wants to save money to buy her mother a gift for her 50th birthday, which is in four years' time. She decides to look at two banks, both offering an interest rate of 8,5% p.a.

She has R1 000 that she can save. The table below shows the amount that she will have saved at each bank annually.

	YEAR 1	YEAR 2	YEAR 3	YEAR 4
BANK A	R1 085	R1 177,23	R1 277,29	---
BANK B	R1 085	R1 170	R1 255	R1 340

Use the above information to answer the questions that follow.

4.3.1 Which bank represents simple interest? Give a reason for your answer. (2)

4.3.2 Sethu claims that if she invests at BANK A, she will have saved R45,86 more than she would at BANK B, after four years.

Verify, showing all calculations, whether her statement is valid or not. (4)

4.3.3 Sethu would like to order her mother a clock from Switzerland. It costs 68,49 Euros. The exchange rate is 1 Euro = R19,83.

If she decides to invest with Bank A, will she have saved enough after four years to afford the gift? (3)

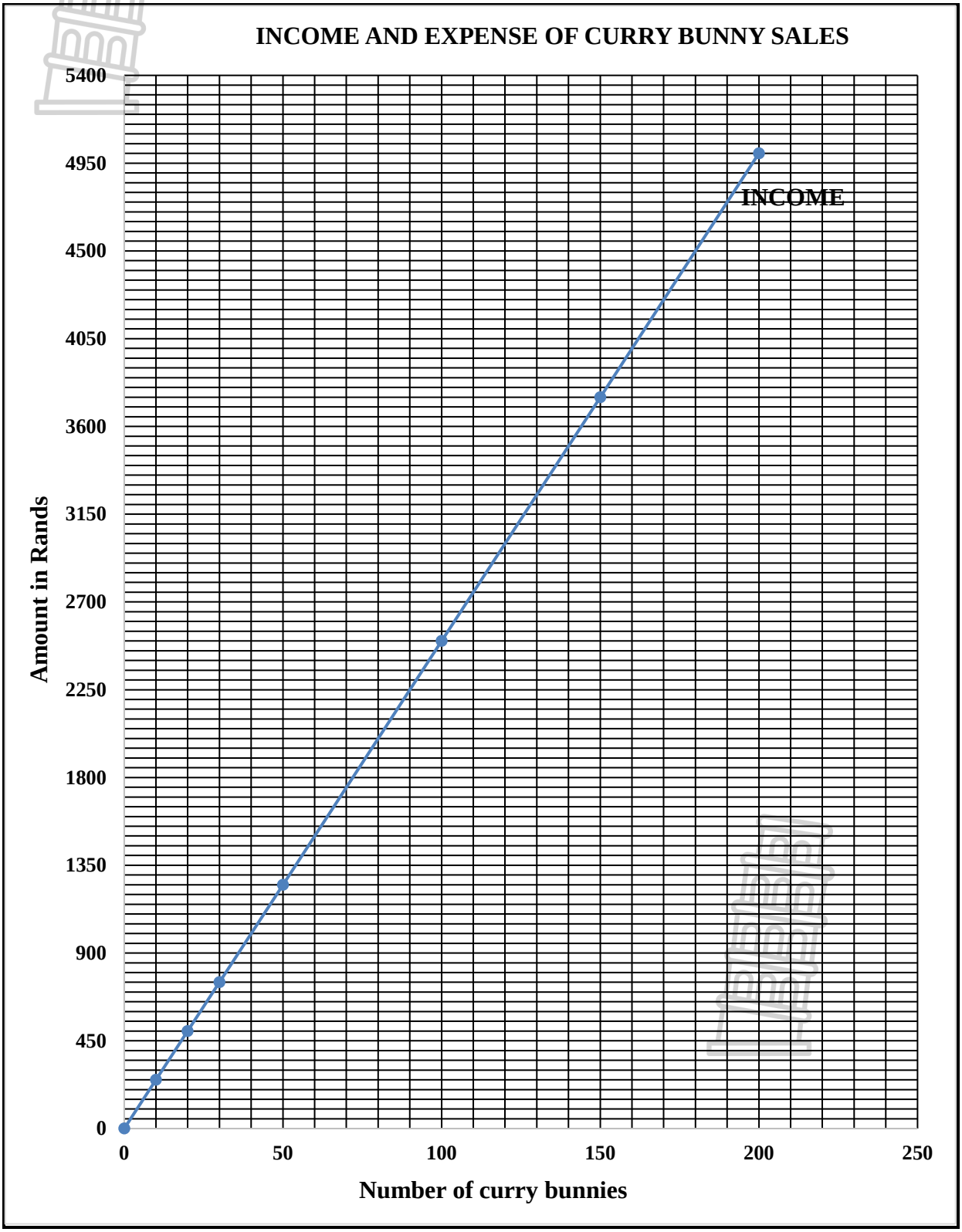
[33]

TOTAL: 100

ANSWER SHEET

NAME OF LEARNER: …… GRADE: ……

QUESTION 4.1.4



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MATHEMATICAL LITERACY P1 MARKING GUIDELINE

MARKS: 100

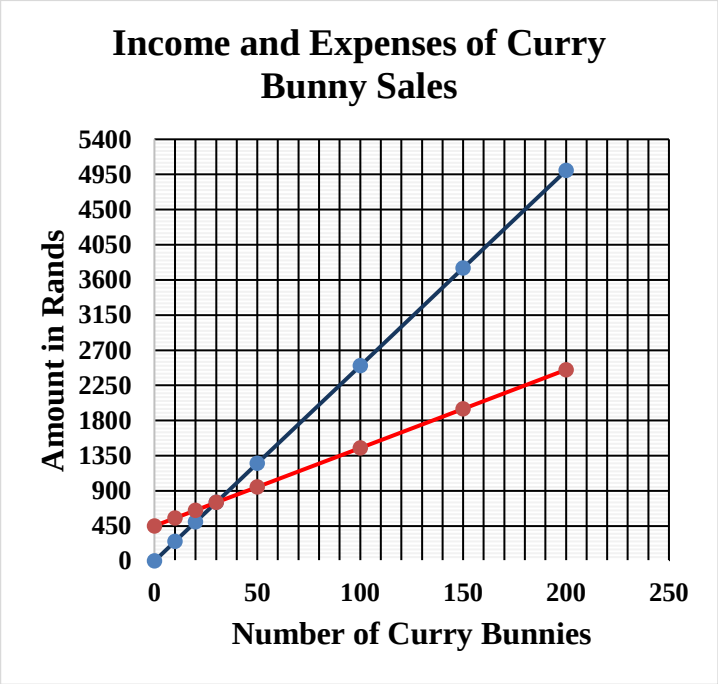
Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Reading from a map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g., for no units, incorrect rounding off etc.
R	Rounding Off/Reason
AO	Answer only
NPR	No penalty for correct rounding

This marking guideline consists of 6 pages.

QUESTION 1 [23 MARKS]			
Ques.	**Solution**	**Explanation AO: FULL MARKS**	**T&L**
1.1.1	A = R33 150 + R1 625 ✓MA = R34 775 ✓A	1MA for adding correct values 1A answer (2)	F L1
1.1.2	R33 150 ÷ 26 ✓MA = R1 275,00 ✓A	1MA for dividing correct values 1A answer (2)	F L1
1.1.3	B = R7 927,86 – (R375 + R850,25 + R1 500) ✓MA = R7 927,86 – R2 725,25 = R5 202,61 ✓A	1MA for subtracting correct values 1A answer (2)	F L1
1.1.4	✓RT Percentage = $\frac{\text{R850,25}}{\text{R7 927,86}} \times 100$ ✓M = 10,72% ✓CA	1RT correct values 1M multiplying by 100 1CA answer (3)	F L1
1.2.1	R22,50 ✓✓RT	2RT reading correct value (2)	F L1
1.2.2	Vaal Plaza Main line ✓✓RT	2RT correct tollgate (2)	F L1
1.2.3	140 : 225 ✓RT 28 : 45 ✓A	1RT correct values 1A simplifying correctly (2)	F L1
1.2.4	R271,00 × 2 ✓MA = R542,00 ✓A	1MA multiplying correct rate by 2 1A answer (2)	F L1
1.3.1	Pie Chart ✓✓RT	2RT correct graph (2)	D L1
1.3.2	✓MA Percentage comedies = 100% – (21% + 6% + 24% + 11%) = 38% ✓A	1MA subtracting 1A percentage (2)	D L1
1.3.3	Number of romance = 24% × 220 ✓MA = 52,8 = 53 students ✓A	1MA multiplying correct percentage 1A correct answer Accept 52 (2)	D L1
		[23]	

QUESTION 2 [25 MARKS]			
Ques	**Solution**	**Explanation/Marks AO: FULL MARKS**	**T/L**
2.1.1	✓M ✓RT Jan 2023: R12,47 × 1,069 = R13,33 ✓A ✓MA Feb 2023: R13,33 × 1,07 = R14,26 ✓CA	1RT correct rate 1M multiplying 1A answer 1MA multiplying with correct rate 1CA answer (5)	F L3
2.1.2	Prices increased ✓A Prices still went up, but by a lower percentages/ the percentages are not negative. ✓O	1A increased 1O reason (2)	F L4
2.2.1	✓A ✓A 7 May 2023	1A 7th 1A May (2)	F L1
2.2.2	Total = R349 × 3 ✓MA = R1 047 ✓A ≈ R1 000 ✓R	1MA multiplying by 3 1A answer 1R rounding to nearest 1 000 (3)	F L2
2.2.3	Labour per hour = R6 500 ÷ 7,5 hrs ✓MA = R866,67 ✓A	1MA dividing by 7,5 1A correct answer (2)	F L2
2.2.4	Total = R5 499 + R1 047 + R1 699 + R6 500 ✓M = R14 745 × 1,15 ✓MA = R16 956,75 ✓CA	CA from 2.2.2 1M adding values 1MA multiplying by 1,15 1CA answer (3)	F L2
2.2.5	✓RT % change $= \frac{5\,795 - 5\,499}{5\,499} \times 100\%$ ✓MA = 5,38% ✓CA ∴ Valid ✓O	1RT correct values 1MA correct % calculation 1CA simplification 1O statement (4)	F L4
2.3	Block 1: 600 kWh × 229,00c = 137 400c ✓MA Block 2: 112 kWh × 278,46c = 31 187,52c ✓MA Total = 168 587,52c ÷ 100 ✓C = R1 685,88 ✓CA	1MA multiplying Block 1 1MA answer Block 2 1C divide by 100 1CA answer (4)	F L3
		[25]	

QUESTION 3 [19 MARKS]			
Ques	**Solution**	**Explanation**	**T&L**
3.1	Forty-five million eight hundred thousand dollars ✓✓RT	2RT correct value (2)	D L1
3.2	Median: ✓RT 5; 25; 47; 50; **52**; 55; 55; 80; 90 ✓MA = $52 000 000 / $52 million ✓A	1RT correct values 1MA method median 1A correct answer (3)	D L3
3.3	Federer total = $121,2 – $30,5 ✓M = $90,7 million ✓A Total = $130 + $121,2 + $115 + $95 + $92,8 + $92,1 + $90,7 + $90 + $83,9 ✓M = $910,7 million / $910 000 000 ✓CA	1M subtracting 1A simplification 1M adding 1CA simplification (4)	D L3
3.4	Mean = $\frac{\$451,7}{9}$ ✓M ✓MA = $50,2 million / $50 200 000 ✓CA	1M adding values 1MA dividing by 9 1CA answer (3)	D L2
3.5	Percentage = $\frac{55}{115} \times 100$ ✓MA = 47,83% ✓A	1MA correct values multiply by 100 1A simplification (2)	D L2
3.6	70 : 90 ✓RT 7 : 9 ✓CA	1RT correct values 1CA simplification of ratio (2)	D L2
3.7	Probability = $\frac{4}{9}$ ✓RT ✓RT = 0,444 ✓CA	1RT numerator 1RT denominator 1CA rounding to 3 decimal places (3)	P L2
		[19]	

QUESTION 4 [33 MARKS]			
Ques	**Solution**	**Explanation/Marks**	**T&L**
4.1.1	Dependent: Amount in Rands ✓RT Independent: Number of curry bunnies ✓RT	1RT dependent 1RT independent (2)	F L1
4.1.2	R250 ÷ 10 ✓MA = R25,00 ✓A	1MA dividing by 10 1A simplification (2)	F L1
4.1.3	✓RT ✓RT Total Expenses = 450 + (10 × number of curry bunnies)	1RT fixed cost 1RT cost per curry bunny (2)	F L2
4.1.4		1A starting point 1A 2 correct points 1A end point (3)	F L2
4.1.5	Profit ONE month = R5 000 – R2 450 = R2 550 ✓A Profit FOUR months = R2 550 × 4 ✓MA = R10 200 ✓CA ∴ Valid ✓O	1A profit one month 1MA profit 4 months 1CA answer 1O statement (4)	F L4
4.2.1	A = 20 + 13 ✓RT = 33 ✓A	1RT adding correct values 1A answer (2)	D L2
4.2.2	15:00 – 17:59 ✓✓A	2A correct answer (2)	D L2
4.2.3	18:00 – 20:59 ✓✓RT	2RT correct time interval (2)	D L2

Ques	Solution	Explanation/Marks	T&L
4.2.4	6,5 ℓ × 77 = 500,5 ℓ ✓MA Cost = 500,5 ℓ × R21,92 ✓M = R10 970,96 ✓CA	1MA calculating litres 1M multiplying 1CA answer (3)	D L3
4.2.5	Probabilty = $\frac{32}{77}$ ✓RT ✓RT	1RT numerator 1RT denominator (2)	P L2
4.3.1	BANK B ✓RT Interest amount is the same for each year. ✓O	1RT correct bank 1O statement/opinion (2)	F L2
4.3.2	BANK A: R1 277,29 × 1,085 ✓MA = R1 385,86 ✓A Difference = R1 385,86 – R1 340 ✓M = R45,86 ∴ Valid ✓O	1MA multiplying by rate 1A simplification 1M difference 1O statement (4)	F L4
4.3.3	68,49 × 19,83 ✓MA = R1 358,16 ✓A ∴ Yes, she will have enough. ✓O	1MA multiplying by exchange rate 1A simplification 1O statement (3)	F L4
		[33]	
		TOTAL: 100	