



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2020

**MATHEMATICAL LITERACY P1
EXEMPLAR**

MARKS: 100

TIME: 2 hours



This question paper consists of 9 pages, including an answer sheet.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions.
2.
 - 2.1 Use the ANSWER SHEET for QUESTION 4.3.2.
 - 2.2 Write your NAME and GRADE in the spaces provided on the ANSWER SHEET for QUESTION 4.3.2.
Hand in the ANSWER SHEET with your ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Maps and 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. You may use an approved calculator (non-programmable and non-geographical), unless stated otherwise.
9. Show ALL calculations clearly.
10. Write neatly and legibly.



QUESTION 1

1.1 Moses earns a gross salary of R10 500 per month. The basic monthly expenses used from the income are as follows:

Housing expense 21%; Food 36%, Transport 10%; Cellphone bills 1,9%. The rest is for savings.

Use the above information to answer the following questions.

- 1.1.1 Calculate the total gross salary per annum. (2)
- 1.1.2 Determine the amount of the monthly food expense. (2)
- 1.1.3 Write down the ratio of the housing percentage to the food percentage in the simplest form. (2)
- 1.1.4 Calculate Moses’s percentage for savings from his salary. (3)

1.2 Thando, a Mathematical Literacy teacher, collected and analysed test results of his class. The test was marked out of a total mark of 50. The results of the learners are indicated below:

38	21	12	18	41
28	24	34	10	35

Use the above information to answer the questions that follow.

- 1.2.1 Is the above data primary or secondary? (2)
- 1.2.2 Write down the highest mark obtained in the test. (2)
- 1.2.3 Explain the meaning of the term ‘median’. (2)
- 1.2.4 Write down the mark out of 50 for a learner who achieved 70% in the test. (2)
- 1.2.5 Write down the number of learners who failed the test, if the pass mark is 20 out of 50. (2)

1.3 A shopkeeper bought a dress for R750 and sold it, making a loss of R50.

- 1.3.1 Explain the meaning of the term ‘loss’ in this context. (2)
- 1.3.2 Calculate the percentage loss made on the sale. (2)

[23]

QUESTION 2

- 2.1 Mrs Rogue invested money monthly from 2016 to 2020 at Company A. She terminated her investment and received the statement below from Old Mutual:

Contract number	Contracting party	Name of Investment plan	Start date of contract	Last premium due date	
17801249	R. Rogue	Smart MAX Focused Education Plan/1	01/07/2016	30/06/2031	
Fund value as at 23 March 2020					
Investment fund		Unit price (cents)	Number of units	Fund value	
Allan Gray Balanced Fund C Class		8 266,470	A	R8 038,07	
Total				R8 038,07	
Difference between fund value and termination value					
Fund value				R8 038,07	
Reduction fees and transaction charges				B	
Termination value				R6 995,25	
Withdrawals up to 23 March 2020				R765,57	
Expected premium details as at 23 March 2020					
Current premium	Annual Increase rate	Next premium increase	New premium	Investment fund(s)	Premium Split
R332,75 monthly	...	01/07/2020	R366,02	Allan Gray Balanced Fund C Class	100%
Total contributions since contract start date					
Total premiums paid				R12 924,75	

- 2.1.1 Write down the name of the investment plan that Mrs Rogue has. (2)
- 2.1.2 Calculate the value of **A**, the number of units earned from the given fund value. (4)
- 2.1.3 Show by means of calculations that Mrs Rogue lost 45,88% of the total premiums she contributed towards the fund by terminating her investment before the last premium. (4)
- 2.1.4 Calculate the value (in Rands) of **B**, the reduction fees and transaction charges. (2)
- 2.1.5 Write down the withdrawal value as at 23 March 2020. (2)

2.1.6 Calculate the percentage increase on the monthly premium. Give your final answer to the nearest percentage.

You may use the following formula:

$$\text{Percentage increase} = \frac{\text{new premium} - \text{current premium}}{\text{current premium}} \times 100\% \quad (4)$$

2.2 Alice sells food from a kiosk that she rents in a township. The expenses associated with ingredients and labour for a plate amount to R30. The formula for expenses: **Expenses = R500 + R30 × Number of plates** She sells food per plate. The graph below shows her expenses and income for a month.



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

2.2.1 Write down the independent variable in the above context. (2)

2.2.2 Determine the amount Alice pays as fixed expenses. (2)

2.2.3 Write down the formula for the income if a plate is sold at R50, in the form of: **Income = ...** (2)

2.2.4 Determine the profit at the break-even point. (2)

2.2.5 Determine the loss when 8 plates are sold. (4)

[30]

QUESTION 3

The Global Wellness Institute did research about the amount of spa revenue generated in different regions of the world in 2017.

TABLE 1: NUMBER OF SPAS, REGIONS AND THE REVENUE GENERATED

Regions	Names of Regions	Number of Spas	Revenue in Billion dollars (\$b)
P	North America	30 394	22,9
Q	Latin America-Caribbean	13 856	6,6
R	Sub-Saharan Africa	3 984	...
S	Middle East – North Africa	6 057	2,8
T	Europe	46 282	33,3
V	Asia – Pacific	48 679	26,5
	TOTAL

[Source: globalwellnessinstitute.org]

Use the information above to answer the questions that follow.

- 3.1 Calculate the total number of spas used for the research in 2017. (2)
- 3.2 Calculate the mean number of spas used. Give your final answer to the nearest whole number. (2)
- 3.3 Express the number of spas in Europe as a percentage of the total number of spas. (2)
- 3.4 Determine the number of regions that lies above the range number of spas. (2)
- 3.5 Write down the unit ratio of spas in regions **P** and **V**. (3)
- 3.6 Calculate the total revenue in billion dollars for the spas if sub-Saharan Africa's revenue is \$5,0 billion less than Latin America-Caribbean's revenue. (4)
- 3.7 Calculate the median revenue of the regions. (3)
- 3.8 Determine the probability (as a percentage) of randomly selecting a region with more than 40 000 spas. (3)

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QUESTION 4

4.1 GOOD BOYS CAR WASHING BAY is in an area where water is charged according to the water tariffs structure shown in TABLE 2 below.

TABLE 2: WATER TARIFF STRUCTURE

Block	Usage in kilolitre (kl)	Normal Charge per kilolitre (kl) (Excluding VAT)
1	0 – 6	R0,00
2	+6 – 15	R9,35
3	+15 – 30	R11,16
4	+30 – 45	R12,53
5	+45 – 60	R13,98
6	60+	R15,34

NOTE: VAT is Value Added Tax. The VAT rate is 15%.

Use TABLE 2 above to answer the question that follow.

Calculate how much GOOD BOYS CAR WASHING BAY pays a month including VAT when they use 25 kl of water and give a reason why a step up (increasing block rate) system of water tariffs is used to charge water consumption other than a flat single rate. (6)

4.2 Andile received a donation from his brother who works in Rwanda. The donation was 745 614,04 Rwanda Francs (RWF). The bank deducted 10% for bank charges. Andile states that he will receive R12 750. Verify the statement with the necessary calculations.

Use the exchange rate **R 0,019 = 1 RWF** (6)

4.3 Ibanda High School recorded absentees in the Grade 11 Mathematical Literacy class during the first week when schools reopened after the COVID-19 pandemic break. The data is shown in the table below.

	Monday	Tuesday	Wednesday	Thursday	Friday
Girls	4	6	8	7	10
Boys	5	3	8	9	7

Use the above information to answer the questions that follow.

4.3.1 Determine the probability that a learner chosen at random was absent on Wednesday. (3)

4.3.2 Complete the double bar graph on the ANSWER SHEET provided by plotting the missing bars for the number of boys and girls absent. (5)

- 4.4 A Grade 11 Mathematical Literacy class at Ibanda High wrote an examination marked out of 100 marks. The results arranged in ascending order are shown below.

23	41	42	50	50	51	54	55	56	57
60	61	65	66	66	67	68	69	70	70
70	72	C	74	76	79	82	85	86	88

Use the above information to answer the questions that follow.

- 4.4.1 The mean of the above data is equal to 64,2. A learner calculated that the value of **C** in the above data is 74. Verify, with the necessary calculations, whether the answer is valid. (4)
- 4.4.2 The frequency table of the above data is shown below.

Class interval	Frequency
20–29	1
30–39	D
40–49	2
50–59	7
60–69	8
70–80	8
80–89	4

Determine the value of **D** and give a reason for your answer. (2)
[26]

TOTAL: 100

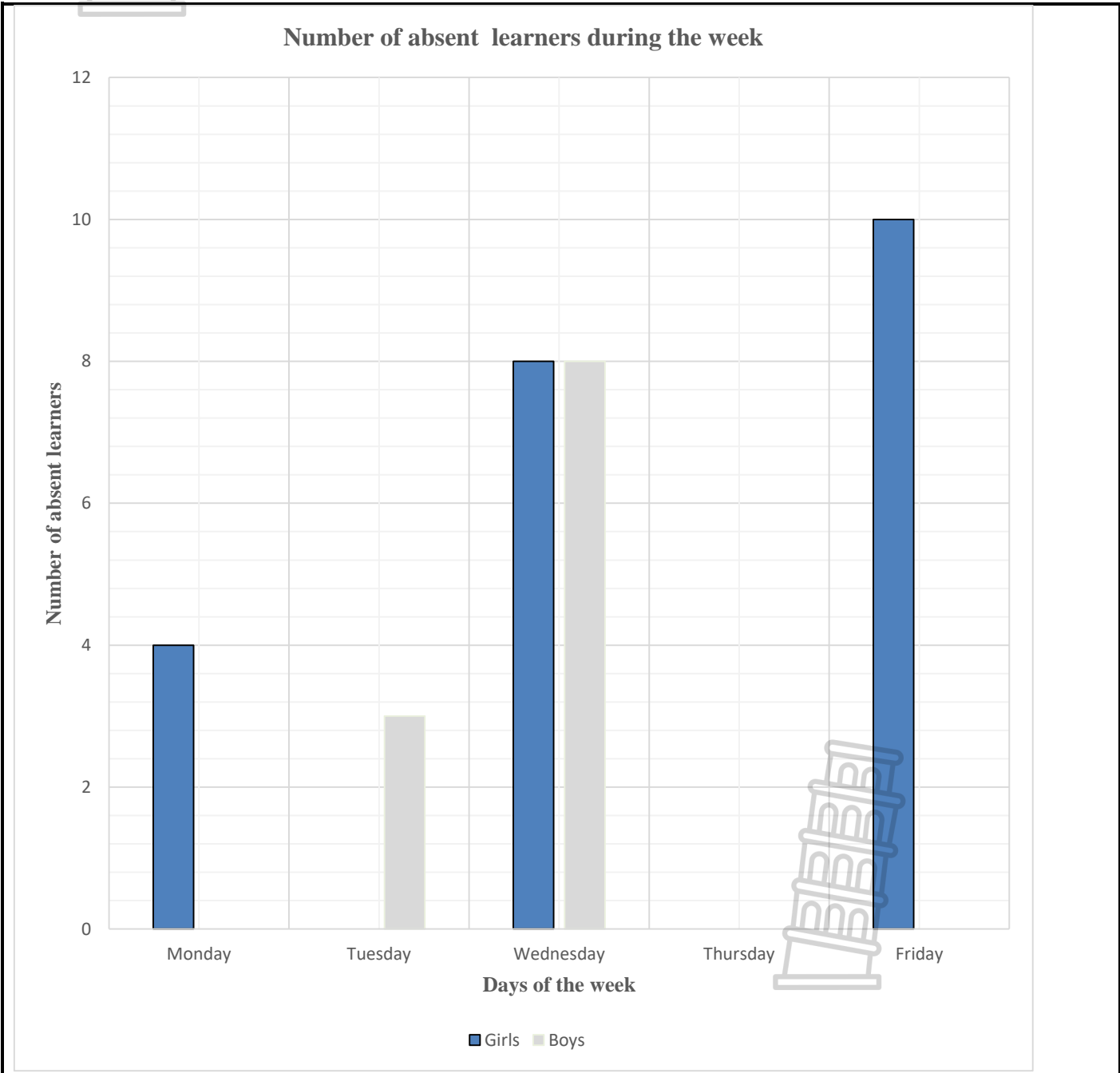


ANSWER SHEET

QUESTION 4.3.2

NAME OF LEARNER:

GRADE 11:





**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2020

**MATHEMATICAL LITERACY P1
MARKING GUIDELINE
EXEMPLAR**

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/Read from 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 rounding

This marking guideline consists of 8 pages.

MARKING GUIDELINES**NOTE:**

- If a candidate answers a question TWICE, only mark the FIRST attempt.
- If a candidate has crossed out (cancelled) an attempt to a question and NOT redone the solution, mark the crossed out (cancelled version)
- Consistent accuracy (CA) applies in ALL aspects of the marking guidelines, however it stops at the second calculation error.
- If the candidate presents any extra solution when reading from a graph, table, layout plan and map, then penalise for every extra incorrect item presented.

LET WEL:

- *As 'n kandidaat 'n vraag TWEE keer beantwoord, merk slegs die EERSTE poging.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, merk die doodgetrekte (gekanselleerde) poging.*
- *Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyn toegepas, maar dit hou by die tweede berekeningsfout op.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem en ekstra antwoorde gee, penaliseer vir elke ekstra verkeerde item.*



QUESTION 1 [23 marks]			
Ques.	Solution	Explanation	T&L
1.1.1	Annual gross salary = R10 500 × 12 ✓ M = R126 000 ✓ A	1M Multiply by 12 1A Gross per annum (2)	F L1
1.1.2	Monthly food expense = R10 500 × 36% ✓ M = R3 780 ✓ CA	1M % Calculation 1CA Amount (2)	F L1
1.1.3	Housing % : Food % = 21% : 36% ✓ M = 7 : 12 ✓ CA	1M Correct values and order 1CA Simplest form (2)	F L1
1.1.4	$\text{Savings \%} = 100\% - (21\% + 36\% + 10\% + 1,9\%)$ $= 100\% - 68,9\% \checkmark M$ $= 31,1\% \checkmark CA$	1M Adding correct values 1M Subtracting from 100 1CA Percentage (3)	F L1
1.2.1	Primary data ✓✓ A	2A Correct data type (2)	D L1
1.2.2	41 ✓✓ RT	2RT Highest mark (2)	D L1
1.2.3	Median is the middle value of a set of data which is arranged from small to big. ✓✓ A	2A Explanation (2)	D L1
1.2.4	35 ✓✓ A	2A Correct mark (2)	D L1
1.2.5	3 ✓✓ RT	2RT No. of learners failed (2)	D L1
1.3.1	Loss is when the cost is more than the income. ✓✓ A OR Loss incurred when selling price is less than cost price of an item. ✓✓ A	2A Correct explanation (2)	F L1
1.3.2	$\% \text{ loss} = \frac{50}{750} \times 100\% \checkmark M$ $= 6,67\% \checkmark CA$	1M Fraction multiplied by 100% 1CA Percentage NPR (2)	F L1
[23]			

QUESTION 2: FINANCE [30 marks]			
Ques.	Solution	Explanation	Topic /Level
2.1.1	SmartMAX Focussed Education Plan 1 ✓✓ RT	2A Correct investment plan (2)	F L1
2.1.2	$\text{Number of units} = \frac{8266,470}{100} \checkmark C$ $= R82,6647 \checkmark CA$ $= \frac{8038,07}{82,6647} \checkmark M$ $= 97,23703104 \checkmark CA$	1C Converted to Rands 1CA Value 1M Division 1CA No. of units (4)	F L2
2.1.3	$\% \text{ loss} = \frac{12\,924,75 - 6\,995,25}{12\,924,75} \times 100 \checkmark M$ $= R5\,929,50 \checkmark S$ $= \frac{5929,50}{12924,75} \times 100 \checkmark M$ $= 45,88\%$ <p style="text-align: center;">OR</p> $\text{Percentage loss} = \frac{6995,25}{12924,75} \times 100 \checkmark M$ $= 54,12\% \checkmark S$ $= 100\% - 54,12\% \checkmark M$ $= 45,88\%$	1M Subtraction of values 1S Simplification 1M Dividing correct values 1M Multiply by 100% <p style="text-align: center;">OR</p> 1M Dividing correct values 1M Multiply by 100% 1S Simplification 1M Subtraction of % (4)	F L3
2.1.4	$B = R8\,038,07 - R6\,995,25 \checkmark MA$ $= R1\,042,82 \checkmark CA$	1MA Subtraction 1CA Correct answer (2)	F L2
2.1.5	R765,57 ✓✓ RT	2RT Correct value (2)	F L2
2.1.6	$\% \text{ increase} = \frac{366,02 - 332,75}{332,75} \times 100 \checkmark SF$ $= 9,998\% \checkmark S$ $= 10\% \checkmark R$	1RT Correct values 1SF Substitution 1S Simplification 1R Nearest % (4)	F L2
2.2.1	Number of plates ✓✓ RT	2RT Number of plates (2)	F L2
2.2.2	Fixed expenses = R500 ✓✓ RT	2RT Fixed expenses (2)	F L2
2.2.3	Income = R50 × Number of plates sold ✓ M ✓ A	1M Multiplication with R50 1A Correct formula (2)	F L2
2.2.4	R0 OR (No Profit) ✓✓ RT	2RT No profit (2)	F L2

2.2.5	<p>Loss for 8 plates = Expenses – Income</p> <p style="padding-left: 40px;">✓RT ✓RT</p> <p style="padding-left: 40px;">= 740 – 400 ✓M</p> <p style="padding-left: 40px;">= R340 ✓A</p> <p style="text-align: center;">OR</p> <p>Expenses = 500 + 8 × 30 = R740 ✓M</p> <p>Income = 50 × 8 = R400 ✓M</p> <p>Loss = 740 – 400 = R340 ✓A</p>	<p>1RT R740</p> <p>1RT R400</p> <p>1M Subtraction</p> <p>1A Loss</p> <p>(From graph allow 340±10)</p> <p style="text-align: center;">OR</p> <p>1M for R740</p> <p>1M for R400</p> <p>1M subtraction</p> <p>1A for R340 exact answer (4)</p>	<p>F</p> <p>L3</p>
[30]			



QUESTION 3: DATA HANDLING (18 marks) AND PROBABILITY (3 marks)			
Ques.	Solution	Explanation	T/L
3.1	Total number of spas $= 30\,394 + 13\,856 + 3\,984 + 6\,057 + 46\,282 + 48\,679$ $= 149\,252$ ✓M ✓A	1M Adding correct values 1A Total (2)	D L1
3.2	Mean $= \frac{149\,252}{6}$ ✓M $= 24\,875,33$ $= 24\,875$ ✓R	CA from 3.1 1M Division 1R Whole number (2)	D L2
3.3	European spas as a % $= \frac{46\,282}{149\,252} \times 100$ ✓M $= 31\%$ ✓CA	1M Fraction with correct values and multiplication by 100 1CA Percentage (2)	D L2
3.4	Range $= 48\,679 - 3\,984$ $= 44\,695$ ✓S Number of regions above range = 2 CA ✓	1S Calculate range 1CA Number of regions (2)	D L3
3.5	$30\,394 : 48\,679 = 1 : \frac{48\,679}{30\,394}$ ✓M ✓M $= 1 : 1,60$ ✓CA	1M Ratio 1M Fraction 1CA Unit ratio NPR (3)	D L3
3.6	Revenue in sub-saharan Africa $= 6,6 - 5,0$ ✓M $= 1,6$ ✓S Total revenue for spas $= 22,9 + 6,6 + 1,6 + 2,8 + 33,3 + 26,5$ ✓M $= \$93,7$ billion ✓CA	1M Subtraction 1S Simplification 1M Addition 1CA Total revenue Penalise 1 mark if not in billions (4)	D L3
3.7	1,6; 2,8; 6,6; 22,9; 26,5; 33,3 ✓M Median revenue $= \frac{6,6 + 22,9}{2}$ ✓M $= \$14,75$ billion ✓CA	CA the value \$1,6 from 3.6 included in the data 1M Arranging in order of descending or ascending 1M Concept of median 1CA Answer in billions (3)	D L3
3.8	P (Regions with more than 40 000 spas) $\frac{2}{6} \times 100$ ✓M $= 33,33\%$ ✓CA	1RT Correct numerator and denominator 1M Multiplication by 100 1CA Percentage NPR (3)	P L2
			[21]

QUESTION 4: FINANCE (12 marks), DATA HANDLING (11 marks) AND PROBABILITY (3 marks)															
Ques.	Solution	Explanation	T/L												
4.1	<p>Cost =</p> <table border="0"> <tr> <td>Kilolitre</td> <td>Cost</td> </tr> <tr> <td>6</td> <td>$6 \times 0 = 0$ ✓M</td> </tr> <tr> <td>9</td> <td>$9 \times 9,35 = R84,15$</td> </tr> <tr> <td>10</td> <td>$10 \times 11,16 = R111,6$ ✓M</td> </tr> <tr> <td>Total = 25 litres</td> <td>$84,15 + 111,60 = R195,75$ ✓M</td> </tr> <tr> <td></td> <td>$R195 \times 115\% = R225,11$ ✓CA</td> </tr> </table> <p>OR</p> <p>Cost = $(6 \times 0) + (9 \times 9,35) + (10 \times 11,16)$ ✓M $= R84,15 + R111,60$ ✓M $= R195,75$ ✓CA</p> <p>Including VAT = $R195,75 \times 15\%$ ✓M $= R29,3625$ ✓M $= R195,75 + R29,3625$ ✓M $= R225,11$ ✓CA</p> <p>Increased block rate tariffs to encourage saving of water ✓A</p> <p>OR</p> <p>Also assist small businesses or families with free water ✓A</p> <p>Accept any other sound reason.</p>	Kilolitre	Cost	6	$6 \times 0 = 0$ ✓M	9	$9 \times 9,35 = R84,15$	10	$10 \times 11,16 = R111,6$ ✓M	Total = 25 litres	$84,15 + 111,60 = R195,75$ ✓M		$R195 \times 115\% = R225,11$ ✓CA	<p>1M Cost of first 6 kℓ</p> <p>1M Cost for both 9 and 10 kilolitres</p> <p>1CA Total cost</p> <p>1M Multiply by 15%</p> <p>1CA Cost including VAT</p> <p>1A Reason</p> <p>(6)</p>	F L4
Kilolitre	Cost														
6	$6 \times 0 = 0$ ✓M														
9	$9 \times 9,35 = R84,15$														
10	$10 \times 11,16 = R111,6$ ✓M														
Total = 25 litres	$84,15 + 111,60 = R195,75$ ✓M														
	$R195 \times 115\% = R225,11$ ✓CA														
4.2	<p>$R0,019 = 1$ RWF</p> <p>$R? = 745\ 614,04$ RWF ✓M</p> <p>$R? = 0,019 \times 745\ 614,04$ ✓M $= R14\ 166,66676$ ✓S</p> <p>Bank charges = $14166,66676 \times \frac{10}{100}$ ✓M $= R1\ 416,66676$ ✓A</p> <p>Andile received = $R14\ 166,66676 - 1\ 416,66676$ ✓M $= R12\ 750$</p> <p>Statement is valid. ✓A</p> <p>OR</p> <p>Bank charges = $\frac{10}{100} \times 745\ 614,04$ RWF ✓M $= 74\ 561,404$ ✓A</p> <p>Andile received in RWF = $745\ 614,04 - 74\ 561,404$ ✓M $= 671\ 052,636$ ✓S</p> <p>In Rands: $R0,019 = 1$ RWF $R? = 671\ 052,636$ RWF ✓M</p> <p>Andile received = $R0,019 \times 671\ 052,636$ ✓M $= R12\ 750$</p> <p>Statement is valid ✓CA</p>	<p>1M Concept of ratio</p> <p>1M Multiplication</p> <p>1S Simplification value in R</p> <p>1M Multiplication of 10%</p> <p>1A Value of 10%</p> <p>1M Subtraction</p> <p>1A Valid</p> <p>OR</p> <p>1M Multiplication of 10%</p> <p>1A Value of 10%</p> <p>1M Subtraction</p> <p>1S Simplification value</p> <p>1M Concept of ratio</p> <p>1M Multiplication</p> <p>1CA Valid</p> <p>(6)</p>	F L4												

4.3.1	Total absentees = 67 ✓ M Absentees on Wednesday = 16 ✓ A $P(\text{absent on Wed}) = \frac{16}{67}$ ✓ CA	1M Addition to 67 1A Absentees on Wed 1CA Fraction (3)	P L2																		
4.3.2	<p style="text-align: center;">Number of absent learners during the week</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Number of absent learners during the week</caption> <thead> <tr> <th>Day</th> <th>Girls</th> <th>Boys</th> </tr> </thead> <tbody> <tr> <td>Monday</td> <td>4</td> <td>5</td> </tr> <tr> <td>Tuesday</td> <td>6</td> <td>3</td> </tr> <tr> <td>Wednesday</td> <td>8</td> <td>8</td> </tr> <tr> <td>Thursday</td> <td>7</td> <td>9</td> </tr> <tr> <td>Friday</td> <td>10</td> <td>7</td> </tr> </tbody> </table>	Day	Girls	Boys	Monday	4	5	Tuesday	6	3	Wednesday	8	8	Thursday	7	9	Friday	10	7	1A for Monday boys at 5 1A for Tuesday girls at 6 1A for Thurs for girls at 7 1A for Thurs for boys at 9 1A for Fri for boys at 7 (5)	D L2
Day	Girls	Boys																			
Monday	4	5																			
Tuesday	6	3																			
Wednesday	8	8																			
Thursday	7	9																			
Friday	10	7																			
4.4.1	Value of C: $64,2 = \frac{C + 1\ 853}{30}$ ✓ M $64,2 \times 30 = C + 1\ 853$ $C = 1\ 926 - 1\ 853$ ✓ M $= 73$ ✓ CA Answer invalid ✓ O	1M Addition (1 853) and division by 30 1M Subtraction 1CA Value of C 1A Invalid (4)	D L4																		
4.4.2	$D = 0$ ✓ A No learners scored 30 – 39 marks ✓ A	1A Value of D 1A Explanation (CA value of D from 4.4.1 included in the data) (2)	D L4																		
[26]																					
TOTAL:			100																		