

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	Name of	Start date	Last
		party	Investment plan	of contract	premium
					due date
			Smart MAX		
17801249		R. Rogue	Focused	01/07/2016	30/06/2031
			Education Plan/1		
Fund value	e as at 23 N	March 2020			
	nvestment	fund	Unit price (cents)	Number of units	Fund value
Allan Gray	Balanced 1	Fund C Class	8 266,470	A	R8 038,07
Total				R8 038,07	
				•	-
Difference	between f	und value and te	ermination value		
Fund value					R8 038,07
Reduction	fees and tra	nsaction charges			В
Terminati	on value				R6 995,25
Withdrawa	ls up to 23	March 2020			R765,57
	_				
Expected 1	oremium d	etails as at 23 M	[arch 2020		
Current	Annual	Next	New premium	Investment	Premium
premium	Increase	premium	-	fund(s)	Split
	rate	increase			
D222.75				Allan Gray	
R332,75	•••	01/07/2020	R366,02	Balanced Fund	100%
monthly				C Class	
Total cont	ributions s	ince contract sta	art date		
Total prem	iums 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)

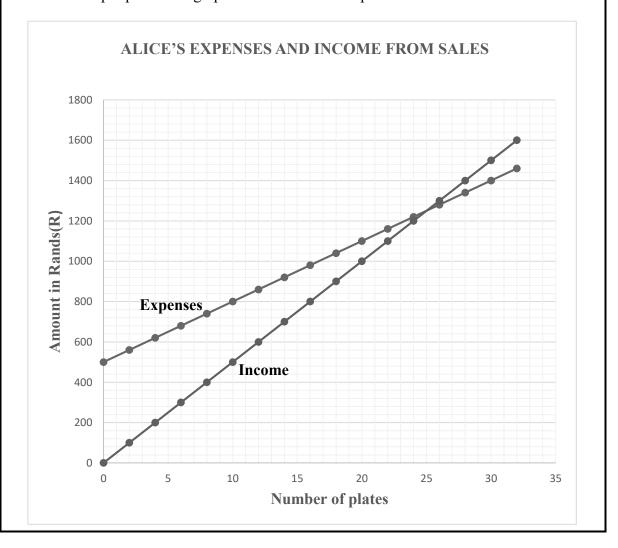
2.1.6 Calculate the percentage increase on the monthly premium. Give your final answer to the nearest percentage.

You may use the following formula:

Percentage increase =
$$\frac{new \ premium - current \ premium}{current \ premium} \times 100\%$$
(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 = $R500 + R30 \times Number$ 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]

[21]

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	Revenue in
		Spas	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)

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 $25 \ k\ell$ 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
Ī	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]

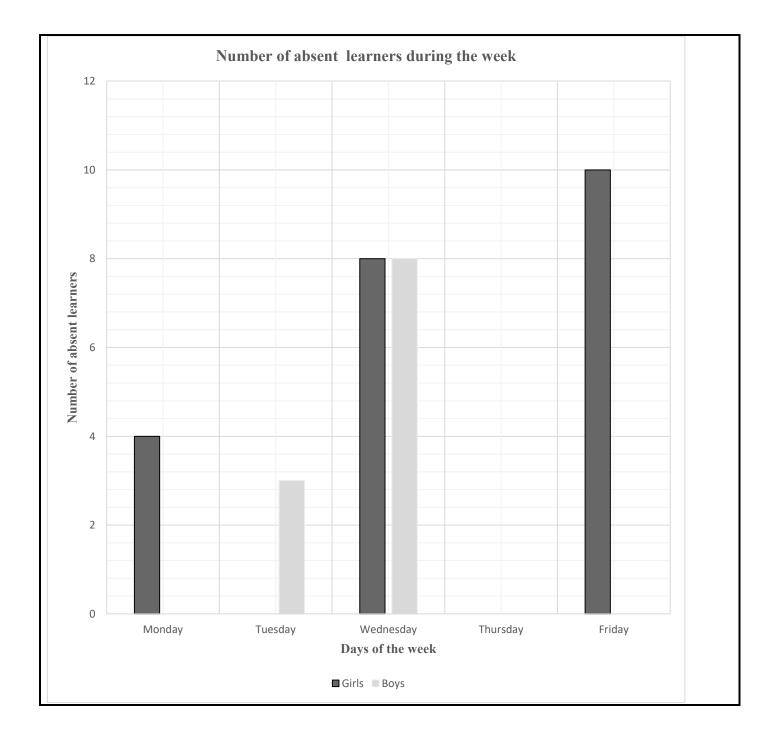
TOTAL: 100

ANSWER SHEET

QUESTION 4.3.2

NAME OF LEARNER:	
	1

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
С	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.

Please turn over

Ques.	Solution	Explanation	T&L
1.1.1	Annual gross salary = R10 500 × 12 ✓ M	1M Multiply by 12	F
1.1.1			
	= R126 000 ✓ A	1A Gross per annum (2)	L1
1.1.2	Monthly food expense = R10 500 × 36% ✓ M	1M % Calculation	F
	= R3 780 ✓CA	1CA Amount (2)	L1
1.1.3	Housing %: Food %		F
1.1.5	= 21%: 36% \(\sqrt{M}\)	1M Correct values and order	L1
	= 7:12 \(\sqrt{CA}\)		Lı
		1CA Simplest form (2)	
1.1.4	Savings $\% = 100\% - (21\% + 36\% + 10\% + 1,9\%)$	1M Adding correct values	F
1.1.7	$= 100\% - 68.9\% \checkmark M$		L1
	,	1M Subtracting from 100	LI
	= 31,1% ✓CA	1CA Percentage (3)	
1.2.1	Primary data ✓✓A	2A Correct data type	D
		(2)	L1
	44 (() D		-
1.2.2	41 ✓✓ RT	2RT Highest mark	D
		(2)	L1
1.2.3	Median is the middle value of a set of data which is arranged	2A Explanation	D
1.2.0	from small to big.	(2)	L1
1.2.4	35 ✓ ✓ A	2A Correct mark	D
		(2)	L1
1.2.5	3 ✓ ✓ RT	2RT No. of learners failed	D
1.2.3	3 V V KI		D
		(2)	L1
1.3.1	Loss is when the cost is more than the income. ✓ ✓ A	2A Correct explanation	F
	OR		L1
	Loss incurred when selling price is less than cost price of an		
	item. ✓✓ A	(2)	
1.3.2	$\% \log = \frac{50}{750} \times 100\% \checkmark M$	1M Fraction multiplied by	F
	$= 6.67\% \checkmark \text{CA}$	100%	L1
	-0,0/70 V CA	1CA Percentage	
		$\mathbf{NPR} \tag{2}$	
		[23]	

Copyright reserved

QUES	TION 2: FINANCE [30 marks]		
Ques.	Solution	Explanation	Topic /Level
2.1.1	SmartMAXFocussed Education Plan 1 ✓✓ RT	2A Correct investment plan (2)	F L1
2.1.2	Number of units = $\frac{8266,470}{100} \checkmark C$ = $R82,6647 \checkmark CA$ = $\frac{8038,07}{82,6647} \checkmark M$	1C Converted to Rands 1CA Value 1M Division	F L2
	= 97,23703104 ✓ CA	1CA No. of units (4)	
2.1.3	% loss = 12 924,75 - 6 995,25 \checkmark M = R5 929,50 \checkmark S = $\frac{5929,50}{12924,75}$ \checkmark M = 45,88%	1M Subtraction of values 1S Simplification 1M Dividing correct values 1M Multiply by 100%	F L3
	Percentage loss = $\frac{6995,25}{12924,75} \times 100 \checkmark M$ = $54,12\% \checkmark S$ = $100\% - 54,12\% \checkmark M$ = $45,88\%$	OR 1M Dividing correct values 1M Multiply by 100% 1S Simplification 1M Subtraction of % (4)	
2.1.4	$B = R8 \ 038,07 - R6 \ 995,25 \checkmark MA$ $= R1 \ 042,82 \checkmark C \ A$	1MA Subtraction 1CA Correct answer (2)	F L2
2.1.5	R765,57 ✓✓RT	2RT Correct value (2)	F L2
2.1.6	$ \frac{\sqrt{RT}}{\% \text{ increase}} = \frac{366,02 - 332,75}{332,75} \times 100 $ $= 9,998\% ✓ S$ $= 10% ✓ R$	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	Loss for 8 plates = Expenses – Income	1RT R740	F
2.2.3	✓RT ✓RT	1RT R400	L3
	$= 740 - 400 \checkmark M$	1M Subtraction	23
	= R340 ✓ A	1A Loss	
	OR	(From graph allow 340±10)	
		OR	
	Expenses = $500 + 8 \times 30 = R740 \checkmark M$	IM for R740	
	Income = $50 \times 8 = R400 \checkmark M$	1M for R400	
	$Loss = 740 - 400 = R340 \checkmark A$	1M subtraction	
		1A for R340 exact answer (4)	
		[30]	

Please turn over

Ques. 3.1		Explanation	
7 . 1	Total number of spas	-	T/L
J.1	= 30 394 + 13 856 + 3 984 + 6 057 + 46 282 + 48 679	1M Adding correct values	D
	=149 252 ✓M ✓A	1A Total (2)	L1
	117 232 - 141 - 14	(2)	
3.2	149 252	CA from 3.1	D
J. <u>L</u>	Mean = $\frac{149252}{6}$ \checkmark M	1M Division	L2
	= 24 875,33	1R Whole number	LL
	= 24 875 ✓ R	(2)	
		(2)	
3.3	46 282	1M Fraction with correct	D
3.3	European spas as a $\% = \frac{46282}{149252} \times 100 \checkmark M$	values and	L2
	= 31% √ CA		L2
		multiplication by 100	
		1CA Percentage (2)	
2.4	D 40 (70 2 004		
3.4	Range = 48 679 – 3 984	10 0 1 1 4	D
	$= 44 695 \checkmark S$	1S Calculate range	L3
	Number of regions above range = 2 CA✓	1CA Number of regions (2)	
	49.670	1)(D	
3.5	$30\ 394:48\ 679 = 1:\frac{48\ 679}{30\ 394} \checkmark M \checkmark M$	1M Ratio	D
	30 374	1M Fraction	L3
	=1:1,60 ✓ CA	1CA Unit ratio	
	,	NPR (3)	
2.6	D : 1 1 40: ((50 ())	1) (C 1 /	
3.6	Revenue in sub-saharan Africa = $6.6 - 5.0 \checkmark M$	1M Subtraction	D
	= 1,6 ✓S	1S Simplification	L3
	Total revenue for spas	1M Addition	
	$= 22.9 + 6.6 + 1.6 + 2.8 + 33.3 + 26.5 \checkmark M$	1CA Total revenue	
	= \$93,7 billion ✓CA	Penalise 1 mark if not in	
		billions (4)	
2 7	16 20 66 220 265 222 614		
3.7	1,6; 2,8; 6,6; 22,9; 26,5; 33,3 ✓M	CA the value \$1,6 from 3.6	D
	66 ± 22 0	included in the data	L3
	Median revenue = $\frac{6.6 + 22.9}{2}$ \checkmark M	1M Arranging in order of	
	= \$14,75 billion ✓CA	descending or ascending	
	— \$14,73 dillion ▼ CA	1M Concept of median	
		1CA Answer in billions (3)	
2.0	D (D : :4 40.000)	1PT C	-
3.8	P (Regions with more than 40 000 spas)	1RT Correct numerator and	Р
	√RT	denominator	L2
	$ \begin{array}{l} \checkmark RT \\ = \frac{2}{6} \times 100 \checkmark M \end{array} $	1M Multiplication by 100	
	б	16.15	
		1 (\ \ 1) ana an 4	
	= 33,33% ✓ CA	1CA Percentage NPR (3)	

Copyright reserved

ies.		Solution	Explanation	T/L
	Cost =		-	1,1
	Kilolitre	Cost		
	6	$6 \times 0 = 0 \checkmark M$	1M Cost of first 6 kℓ	F
	9	$9 \times 9.35 = R84.15$	1M Cost for both 9 and 10	L4
	10	$10 \times 11,16 = R111,6$	kilolitres	
	Total = 25 litres	$84,15 + 111,60 = R195,75 \checkmark M$	1CA Total cost	
		$ \sqrt{M} $ R195 ×115% = R225,11 $ \sqrt{CA} $ OR	1M Multiply by 15% 1CA Cost including VAT	
	Cost = $(6 \times 0) + (9 \times 9,3)$ = R84,15 + R111,60 = R195,75 \checkmark CA Including VAT = R195,7 = R29,30 = R195,7 = R225,1	75 × 15% ✓M 625 5 + R29,3625		
		fs to encourage saving of water ✓A OR ses or families with free water ✓A I reason.	1A Reason (6)	
<u> </u>	R0,019 = 1 RWF		1M Concept of ratio	F
	R? = 745 614,04 I	RWF ✓M	1	L4
	R? $= 0.019 \times 745$		1M Multiplication	
	= R14 166,666		1S Simplification value in R	
	Bank charges = 14166,66	$6676 \times \frac{10}{100} \checkmark M$	1M Multiplication of 10%	
	= R1 416,6		1A Value of 10% 1M Subtraction	
	Andile received = R14 10 = R12 75	66,66676 − 1 416,66676 ✓ M	TWI Subtraction	
	Statement is valid. ✓ A		1A Valid	
			OR	
	10	OR	1M Multiplication of 10%	
	Bank charges = $\frac{10}{100} \times 74$	5 614,04 RWF ✓ M	1A Value of 10%	
	= 74561,4		1M Subtraction	
		= 745 614,04 − 74 561,404 ✓ M = 671 052,636 ✓ S	1S Simplification value	
		= 1 RWF	1M Concept of ratio	
		= 671 052,636 RWF ✓M	1M Multiplication	
	Andile received = R0,019	9 × 671 052,636 ✓ M		
	= R12.75	50	I I	

4.3.1	Total absentees = 67 ✓ M	1M Addition to 67	P
	Absentees on Wednesday =16 ✓A	1A Absentees on Wed 1CA Fraction	L2
	P(absent on Wed) = $\frac{16}{67}$ \checkmark CA	(3)	
4.3.2	Number of absent learners during the week 12 10 8 4 A A A A A A A A A A A A A A A A A A	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	D L2
		(5)	
4.4.1	Value of C: $64,2 = \frac{C+1853}{30} \checkmark M$ $64,2 \times 30 = C+1853$	1M Addition (1 853) and division by 30	D L4
	$C = 1926 - 1853 \checkmark M$ = 73 \checkmark CA	1M Subtraction 1CA Value of C	
	Answer invalid ✓O	1A Invalid (4)	
4.4.2	$D = 0 \checkmark A$ No learners scored $30 - 39$ marks $\checkmark A$	1A Value of D 1A Explanation (CA value of D from 4.4.1	D L4
		included in the data) (2) [26]	
		TOTAL:	100