**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2022

**MATHEMATICAL LITERACY P1
MARKING GUIDELINE**

MARKS: 150

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT	Reading from a table/a graph/document/diagram
SF	Correct substitution in a formula
O	Opinion/Explanation
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding off
NPR	No penalty for correct rounding minimum two decimal places
AO	Answer only
MCA	Method with constant accuracy

This marking guideline consist of 12 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.

NASIENRIGLYNE

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 [30 MARKS]   ANSWER ONLY FULL MARKS

Ques.	Solution	Explanation	T&L
1.1.1	$\checkmark$RT Petrol price $= R9{,}37 + R4{,}09 + R2{,}18 + R3{,}83$ $= R19{,}47$ **OR** $\qquad\qquad\qquad\qquad \checkmark$A Petrol price $= 180{,}78 \div 100 \times R10{,}77$ $= R19{,}47$	1RT adding correct 2 values 1RT adding other correct values (2)	F L1 E
1.1.2	173% $\checkmark\checkmark$RT	2 RT correct % value corresponding to petrol levy (2)	F L1 E
1.1.3	$\checkmark$MA $\checkmark$M $1{,}49 \times R6{,}29 = R9{,}3721$$\checkmark$S $\qquad\qquad = R9{,}37$ **OR** $\overset{\checkmark\text{MA}}{\frac{49}{100}} \times 6{,}29 \overset{\checkmark\text{S}}{=} R3{,}08$ Price $= R6{,}29 + R3{,}08$ $\checkmark$M $\qquad = R9{,}37$	1MA value 1,49 1M multiplication with 6,29 1S simplification. correct values **OR** 1MA multiplication with % 1S simplification 1M adding (3)	F L1 D
1.2.1	Facebook data $= 400{,}45 - (27{,}45 + 90 + 43 + 125)$ $\qquad\qquad\qquad = 115 \text{ MB}$ $\checkmark$CA	1M subtracting other values from total 1CA Facebook data with units (2)	D L1 E
1.2.2	1 000 MB : R149 1 MB : R0,149 $\checkmark$M 400,45 MB : R0,149 $\times$ 400,45 $\checkmark$M Cost of 400,45 MB = R59,67 $\checkmark$CA **OR** 1 000 cost R149,00 The cost of 400,45 $= \overset{\checkmark\text{M}}{\frac{400{,}45}{1000}} \times 149$ $\checkmark$M $\qquad\qquad = R59{,}67$ $\checkmark$CA	1M cost of 1 MB 1M cost of 1MB multiplying by 400,45 1CA answer **OR** 1M fraction with correct values 1M multiplication by R149. 1CA answer (3)	F L1 E

         Please turn over

1.2.3	Balance = 1 000 MB − 400,45 MB
	= 599,55 MB ✓S
	
	= 599,55 × 1 000 ✓C
	
	= 599 550 KB ✓CA
	
	OR
	      ✓C
	                   ✓S
	Balance = 1 000 000 − 400 450 KB
	
	        = 599 550 KB ✓CA
		1S subtraction and simplifying for balance in MB
		1C conversion to KB by multiplying by 1 000
		1CA answer
		
		1C conversion to KB by multiplying by 1 000
		1S subtraction
		1CA answer
		                 (3)
			D
			L1
			D

1.3.1	Income = 300 000 + 71 750 + 3 000 ✓MA
	              ✓A
	      = R374 750
		1MA adding the income items
		1A answer
		               (2)
			F
			L1
			E

1.3.2	Deficit; Loss, income is less than expenditure; income shortage experienced ✓✓O	2O Choice (2)	F L1 E
1.3.3	School fees ✓✓RT	2RT reading the item of income that decreased a lot (2)	F L1 E
1.4.1	✓M National = 46 960 + 21 450 + 87 381 + 105 651 + 59 560 + 37 857 + 30 125 + 9 813 + 42 270 = 441 067 ✓CA	1MA adding 1CA answer (2)	D L1 E
1.4.2	✓RT 68,6; 67,2 ; 71,3; 71,5; 72,3 = 5 ✓CA	1RT values less than national performance 1CA answer **AO** (2)	D L1 E

1.4.3	✓RT ✓M
	Number Passed = 72,3 % × 46 960
	
	           = 33 952,08
	               ✓ CA
	        = 33 952
	✓ MA
		1RT 72,3% and 46 960
		1M multiplication
		1S simplification
		1R rounding
		(Accept 33 953)
		               (3)
			D
			L1
			M

1.4.4	✓ A 100 − 71,3 % = 28,7%	1MA subtracting 71,3 from 100 1A answer (2)	P L1 E
		[30]	

QUESTION 2 [27 MARKS]			
Ques.	**Solution**	**Explanation**	**T&L**
2.1.1	Ratio $= 40 : 190$ ✓M $\quad = 1 : 4{,}75$ ✓CA	1M correct values ratio form 1CA correct answer (2)	F L2 E
2.1.2	% saving $= \frac{101}{300} \times 100\%$ ✓M $\quad\quad = 33{,}67\,\%$ ✓CA	1M correct values and concept of % 1 CA correctly rounded answer (2)	F L2 E
2.1.3	Savings on Casio $= 8 \times R101 = R808$ ✓M Savings on Sharp $= 12 \times R40 = R480$ ✓M Total savings $\quad = R808 + R480$ $\quad\quad\quad\quad\quad = R1\,288{,}00$ ✓CA **OR** Savings on Casio$= (R300 \times 8) - (R199 \times 8) = R808$ ✓M Savings on Sharp $= (R190 \times 8) - (R150 \times 8) = R480$ ✓M Total savings $\quad = R808 + R480 = R1\,288{,}00$ ✓CA	1M savings on Casio 1M savings on Sharp 1 CA addition and answer **OR** 1M savings on Casio 1M savings on Sharp 1CA addition and answer (3)	F L2 E
2.2	**Interest year 1**: $\frac{9{,}5}{100} \times 4\,500 = R427{,}50$ ✓A Amount for 2nd year start $= R4500 + R427{,}50$ $\quad\quad\quad\quad\quad\quad\quad = R4\,927{,}50$ ✓CA **Interest year 2** $= \frac{9{,}5}{100} \times R4\,927{,}50 = R468{,}11$ ✓CA Amount at end of 2nd year $= R4\,927{,}50 + R468{,}11$ $\quad\quad\quad\quad\quad\quad\quad = R5\,395{,}61$ ✓CA GET LESS THAN THE BUDGETED ✓O **OR** At end of year 1 amount $= 1{,}095 \times 4\,500 = R4\,927{,}50$ ✓M ✓A At end of year 2: Amount $= 1{,}095 \times 4\,927{,}50 = R5\,395{,}61$ ✓M ✓A GET LESS THAN THEY BUDGETED ✓O	1A interest for year 1 1CA amount for start year 2 1CA interest for year 2 1CA answer 1O reason 1M multiplication with % including interest 1A amount at end of year 1 1M multiplication with % including interest. 1A amount at end year 2 1O reason (5)	F L4 M

2.3.1	Gross income is the amount of her salary (income) before deductions are made. ✓✓O	2O correct explanation (2)	F L1 M

2.3.2	Tax = $\frac{18}{100} \times 151\ 100$ ✓M
	
	    = R27 198 ✓S
	Rebates (for 75 years or older)
	 = R15 714 + R8 613 + R2 871
	 = R27 198 ✓S
	
	Actual tax = Tax – Rebates
	        = R27 198 – R27 198 ✓M
	        = R0 (no tax to pay) ✓A
		1M 18% of 151 100
		
		1S simplification
		
		1S adding all the rebates
		
		1M subtracting rebates from tax payable
		1A answer
		(5)
			F L2 M

2.3.3	Annual Income (Gross) = R39 486 × 12
	               = R473 832 ✓M
	
	Annual Pension = R473 832 × 7,5% ✓M
	
	         = R35 537,40 ✓CA
	
	Taxable income = R473 832 – R35 537,40
	         = R438 294,60 ✓A
	
	Tax brackect 3: R337 801 – R467 500
	
	Tax = 70 532 + 31 % of taxable income above R337 800
	  = 70 532 + $\frac{31}{100}$ × (438 294,60-337 800) ✓SF
	  = 70 532 + $\frac{31}{100}$ × 100 494,60
	  = 70 532 + 31 153,33 ✓S
	  = R101 685,33 ✓CA
	Annual Tax payable = R101 685,33 – Primary rebate
	         = R101 685,33 – R15 714
	         = R85 971,33 ✓MCA
		1M gross annual income
		
		1M for 7,5% of gross annual income)
		1CA annual pension
		
		1A taxable income
		
		1SF substitution in tax bracket 3
		
		1S simplification
		1CA tax before rebate
		
		1MCA simplification: tax after subtracting rebate
		
		(8)
			F L4 D

		[27]	

QUESTION 3 [30 MARKS]

Ques.	Solution	Explanation	T&L
3.1.1	KZN (males) = 69 000 + 99 000 + 214 000 ✓MA = 382 000 ✓CA	1MA adding correct values 1CA answer　(2)	D L1 E
3.1.2	Range = Highest value − Lowest value 　　= 363 000 − 34 000 ✓RT　✓M 　　= 329 000 ✓A	1RT correct values 1M subtraction 1CA answer　(3)	D L2 E
3.1.3	✓M 725 000 + 597 000 + 143 000 + 316 000 + 757 000 + 400 000 + 1 199 000 + 322 000 +277 000 　= 4 736 000 Mean $= \dfrac{4\ 736\ 000}{9}$ ✓M 　　= 526 222,22　✓CA	1M Adding values 1M dividing by 9 1CA answer **(NPR)**　(3)	D L2 M
3.1.4	**Provincial totals with chronic sickness (in '000')** 　　　　　　✓M WC: 1 225; EC: 987; NC: 203; FS: 433; KZN: 1 290; NW: 547; GP: 1 803; MP: 500; LP: 406 Arrange: 203; 406; 433; 500; 547; 987; 1 225; 1 290; 1 803 ✓CA Median = 547 ✓CA	1M totals of the provincial numbers with chronic health conditions. 1CA arranging 1CA answer　(3)	D L3 M
3.1.5		1M for first 3 provinces plotted correctly 1M next 3 provinces plotted correctly 1M last 3 provinces plotted correctly 1CA joining the points 　(4)	D L3 E

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3.1.6	Female with diabetes in KZN = 264 ✓RT
	Total people with chronic conditions in KZN
	= 170 + 363 + 757 ✓M
	= 1 290
	
	P (Female with diabetes) = $\frac{264}{1290} \times 100$ %✓M
	
	                    = 20,465 %
	                    = 20,5 % ✓CA
		1RT number from table for 264.
		1M total with chronic in KZN
		1M fraction and multiplication with 100%
		
		1CA answer
		                    (4)
			P
			L3
			D

3.2.1	Bar graph ✓✓A	2A graph 2A naming the graph (2)	D L1 E
3.2.2	59,62 – (1,29 + 4,68 + 6,73 + 2,93 + 5,85 + 4,11 + 7,01 + 11, 53) ✓M = 59,62 – 44,13 = 15,49 million ✓M = 15 490 000 ✓A Fifteen million, four hundred ninety thousand. ✓CA	1M adding the population 1M subtracting total from 59,62 1A answer CA final answer in words (4)	D L2 M

3.2.3	Population arranged in order: ✓M
	1,29; 2,93; 4,11; 4,68; **5,85;** 6,73; 7,01; 11,53; **15,49**
	
	Q1 = $\frac{2,93+4,11}{2}$
	
	     = 3,52 ✓CA
	
	Q3 = $\frac{7,01+11,53}{2}$
	
	    = 9,27 ✓CA
	
	IQR = 9,27 – 3,52 ✓SF
	
	   =5,75 million ✓CA
		CA value GP from 3.2.2
		
		1M arranging population in order.
		
		1CA answer for Q1
		
		1CA answer for Q3
		
		1SF formula
		
		1CA answer with million
		                    (5)
			D
			L3
			M

			[30]

QUESTION 4 [32 MARKS]

Ques.	Solution	Explanation	T&L
4.1.1 (a)	C = R200 (the first 200 minutes free) ✓✓RT **OR** Total expenses $=$ 200 + (n – 100) × 1,20 $\qquad\qquad=$ 200 + (100 – 100) × 1,20 ✓SF $\qquad\qquad=$ 200 + 0 × 1,20 $\qquad\qquad=$ R200 ✓A	2 RT reading from given info **OR** 1SF substitution 1A simplification and answer (2)	F L1 M
4.1.1 (b)	Total expenses $\quad=$ 200 + (n – 100) × 1,20 $\quad$ 500 $\qquad=$ 200 + (D – 100) × 1,20 ✓SF $\quad$ 500–200 $\;=$ (D – 100) × 1,20 $\quad$ 300 ÷ 1,2 $=$ D – 100 ✓S $\qquad$ 250 $\quad= $ D – 1 00 $\quad$ 250 + 100 $= $ D $\qquad$ 350 $= $ D ✓A	1SF substitution 1S simplification 1A answer (3)	F L3 D
4.1.2	✓✓O Prepaid means airtime is paid in advance. **OR** One pays before can make calls, sms, etc. ✓✓O	2O explanation (2)	F L1 E
4.1.3	Jane paid = R1,75 × 200 ✓MA $\qquad$ = R350 ✓A	1MA multiplication 1A (2)	F L1 E
4.2.1	✓✓RT R80	2RT reading from the table (2)	F L1 E
4.2.2	✓SF $\quad$ ✓SF Total = 80 + 2,25 × $\frac{1500}{100}$ + 5× $\frac{500}{100}$ = R80 +R33,75 + R25 ✓S Total = R138,75 ✓S Statement NOT valid. ✓O	2SF substitution 1S simplification 1S simplification 1O opinion (5)	F L4 M

Ques.	Solution	Explanation	T&L
4.2.3	$$\checkmark MA$$ $$\text{VAT amount } = \frac{15}{115} \text{ X } 1\,500 \checkmark MA$$ $$= R195,65 \checkmark A$$ **OR** $$\text{VAT exclusive price} = \frac{100}{115} \times 1\,500 = R1\,304,35 \checkmark MA$$ $$\text{VAT amount} = R1\,500 – R1\,304,35 \checkmark MA$$ $$= R195,65 \checkmark A$$	1MA for fraction with correct values 1MA multiplication with R1 500 1A answer. (3) **OR** 1MA for VAT exclusive price 1MA subtracting the values 1A answer (3)	F L1 M
4.2.4	Cashsend $\checkmark O$ eWallet $\checkmark O$	1O explanation 1O explanation (2)	F L1 E
4.3.1	Amount for 5 days $= R4\,042,19 \times 5$ $= R20\,210,95 \checkmark MA$ R5 : (¥)37,51715 R20 210,95 : ? $\checkmark M$ $$\text{Exhanged Yens} = \frac{20\,210,95 \times 37,51715}{5} \checkmark M$$ $= ¥151\,651,45 \checkmark CA$	1MA amount in Rands for 5 days 1M multiplication values in numerator 1M division by 5 1CA answer (4)	F L3 D
4.3.2	$\checkmark M$ Daily rental fee $= 368,6 \cdot \times 2 \times 1,82 \checkmark C$ $= R1\,341,70 \checkmark CA$	1C converting cents to Rands 1M multiply correct values 1CA Answer (3)	F L2 E
4.3.3	100 km $= 7$ ℓ 1 km $= 0,07$ ℓ $\checkmark RT$ $\checkmark M$ Petrol cost $= (0,07 \times 368,6 \text{ km} \times 2) \times R19,89 \checkmark M$ $= R1\,026,40 \checkmark CA$	1RT using 0,07 litres 1M number of litres of petrol 1M multiplication by R19,89 1CA answer. (4)	F L3 E
		[32]	

QUESTION 5 [31 MARKS]			
Ques.	**Solution**	**Explanation**	**T&L**
5.1.1	Tickects for under 18 = $\dfrac{3}{6} \times 930$ ✓MA $= 465$ ✓A	1MA multiplication of fraction and 930 1A answer (2)	D L1 E
5.1.2	Amount = $\dfrac{60}{100} \overset{✓M}{\times} \dfrac{2}{6} \overset{✓M}{\times} 930 \times 45$ $= \text{R36 270}$ ✓A **OR** Tickets sold in 2021 $= \dfrac{60}{100} \times 930 = 558$ ✓M Tickets for Adults $= \dfrac{2}{6} \times 558 \;\;\; = 186$ ✓M Costs of tickets $= 186 \times 45 \;\;\;\;\; = \text{R8 370}$ ✓CA	1M multiplication of % and fraction of 930 1M multiplication of R45 1A answer **OR** 1M tickets sold in 2021 1M tickets bought by adults in 2021 1CA answer (3)	F L2 M
5.2.1	Line graph, compound bar graph ✓✓O	2O explanation (2)	D L1 E
5.2.2	Switzerland ✓✓RT	2RT reading the pie chart data (2)	D L1 E
5.2.3	$100\% - (3\% + 3{,}6\% + 5\% + 4\% + 6\% + 8\% + 9\% +$ $20{,}5\% + 17{,}5\%)$ ✓M ✓M $= 23{,}4\% \times 1\,848\,412$ ✓M $= 432\,528{,}4$ ✓S $= 432\,528$ ✓A NOT CORRECT ✓O	1M addition of percentage 1M subtraction of total from 100% 1M 23,4% of total 1S simplification 1A answer 1O reason (6)	D L4 D
5.2.4	Probability = 9% ✓RT $= \dfrac{9}{100}$ ✓M $= 0{,}09$ ✓A	1RT correct % 1M fraction 1A answer in decimal (3)	P L2 M

5.2.5	Covid-19 restrictions no movements ✓✓O	2O reason **(allow any other possible reason)** (2)	D L1 E
5.3.1	Immediately get money from customers ✓O It easy to collect its income from electricity ✓O No bad debts on prepaid electricity ✓O It enables its customers to save electricity and the municipality can supply more customers ✓O It gets more income on customers that use more electricity ✓O Accept any other logical explanation.	1O reason 1O reason (2)	F L1 M
5.3.2	Units purchased = $\frac{R68,02}{1,4472}$ ✓MA✓C = 47 kWh ✓A	1MA division with the correct values 1A answer (3)	F L3 M
5.3.3	Municipality's cost = 290 × 1,33 = R385,50 ✓A Customer pays: 50 × 1,4472 = R72,36 ✓MA 240 × 1,8606 = R446,544 ✓MA Total price paid = R72,36 + R446,544 = R518,90 % Profit = $\frac{R518,90 - R385,50}{R385,50}$ × 100 % ✓SF = 34,60 % ✓CA Valid ✓O	1A municipality's cost 1MA multiplication and simplification in block 1 1MA multiplication and simplification in block 2 1SF substitution in formula 1CA answer 1O answer (6)	F L4 M
		[31]	
		TOTAL: 150	