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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	$\begin{aligned} \text{Petrol price} &= \text{R}9,37 + \text{R}4,09 + \text{R}2,18 + \text{R}3,83 \\ &= \text{R}19,47 \end{aligned}$ <p>OR</p> $\begin{aligned} \text{Petrol price} &= 180,78 \div 100 \times \text{R}10,77 \\ &= \text{R}19,47 \end{aligned}$	\checkmark RT 1RT adding correct 2 values 1RT adding other correct values (2)	F L1 E
1.1.2	$173\% \quad \checkmark\checkmark$ RT	2 RT correct % value corresponding to petrol levy (2)	F L1 E
1.1.3	$\begin{aligned} \checkmark\text{MA} \quad \checkmark\text{M} \\ 1,49 \times \text{R}6,29 &= \text{R}9,3721 \checkmark\text{S} \\ &= \text{R}9,37 \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \checkmark\text{MA} \quad \checkmark\text{S} \\ \frac{49}{100} \times 6,29 &= \text{R}3,08 \end{aligned}$ $\begin{aligned} \text{Price} &= \text{R}6,29 + \text{R}3,08 \quad \checkmark\text{M} \\ &= \text{R}9,37 \end{aligned}$	1MA value 1,49 1M multiplication with 6,29 1S simplification. correct values <p style="text-align: center;">OR</p> 1MA multiplication with % 1S simplification 1M adding (3)	F L1 D
1.2.1	$\begin{aligned} \text{Facebook data} &= 400,45 - (27,45 + 90 + 43 + 125) \\ &= 115 \text{ MB} \quad \checkmark\text{CA} \end{aligned}$	1M subtracting other values from total 1CA Facebook data with units (2)	D L1 E
1.2.2	$\begin{aligned} 1 \text{ 000 MB} &: \text{R}149 \\ 1 \text{ MB} &: \text{R}0,149 \quad \checkmark\text{M} \\ 400,45 \text{ MB} &: \text{R}0,149 \times 400,45 \quad \checkmark\text{M} \\ \text{Cost of } 400,45 \text{ MB} &= \text{R}59,67 \quad \checkmark\text{CA} \end{aligned}$ <p style="text-align: center;">OR</p> 1 000 cost R149,00 $\begin{aligned} \text{The cost of } 400,45 &= \frac{\checkmark\text{M}}{1000} \times 149 \quad \checkmark\text{M} \\ &= \text{R}59,67 \quad \checkmark\text{CA} \end{aligned}$	1M cost of 1 MB 1M cost of 1MB multiplying by 400,45 1CA answer <p style="text-align: center;">OR</p> 1M fraction with correct values 1M multiplication by R149. 1CA answer (3)	F L1 E

1.2.3	$\begin{aligned} \text{Balance} &= 1\,000\text{ MB} - 400,45\text{ MB} \\ &= 599,55\text{ MB} \quad \checkmark\text{S} \\ &= 599,55 \times 1\,000 \quad \checkmark\text{C} \\ &= 599\,550\text{ KB} \quad \checkmark\text{CA} \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \text{Balance} &= 1\,000\,000 - 400\,450\text{ KB} \quad \checkmark\text{C} \quad \checkmark\text{S} \\ &= 599\,550\text{ KB} \quad \checkmark\text{CA} \end{aligned}$	<p>1S subtraction and simplifying for balance in MB 1C conversion to KB by multiplying by 1 000 1CA answer</p> <p>1C conversion to KB by multiplying by 1 000 1S subtraction 1CA answer</p> <p style="text-align: right;">(3)</p>	D L1 D
1.3.1	$\begin{aligned} \text{Income} &= 300\,000 + 71\,750 + 3\,000 \quad \checkmark\text{MA} \\ &\quad \checkmark\text{A} \\ &= \text{R}374\,750 \end{aligned}$	<p>1MA adding the income items 1A answer</p> <p style="text-align: right;">(2)</p>	F L1 E
1.3.2	<p>Deficit; Loss, income is less than expenditure; income shortage experienced $\checkmark\checkmark\text{O}$</p>	<p>2O Choice</p> <p style="text-align: right;">(2)</p>	F L1 E
1.3.3	<p>School fees $\checkmark\checkmark\text{RT}$</p>	<p>2RT reading the item of income that decreased a lot</p> <p style="text-align: right;">(2)</p>	F L1 E
1.4.1	$\begin{aligned} \text{National} &= 46\,960 + 21\,450 + 87\,381 + 105\,651 \\ &+ 59\,560 + 37\,857 + 30\,125 + 9\,813 + 42\,270 \\ &= 441\,067 \quad \checkmark\text{CA} \end{aligned}$	<p>1MA adding 1CA answer</p> <p style="text-align: right;">(2)</p>	D L1 E
1.4.2	$\begin{aligned} &68,6; 67,2; 71,3; 71,5; 72,3 \\ &= 5 \quad \checkmark\text{CA} \end{aligned}$	<p>1RT values less than national performance 1CA answer AO</p> <p style="text-align: right;">(2)</p>	D L1 E
1.4.3	$\begin{aligned} \text{Number Passed} &= 72,3\% \times 46\,960 \quad \checkmark\text{RT} \quad \checkmark\text{M} \\ &= 33\,952,08 \\ &= 33\,952 \quad \checkmark\text{CA} \\ &\quad \checkmark\text{MA} \end{aligned}$	<p>1RT 72,3% and 46 960 1M multiplication 1S simplification 1R rounding (Accept 33 953)</p> <p style="text-align: right;">(3)</p>	D L1 M
1.4.4	$100 - 71,3\% = 28,7\% \quad \checkmark\text{A}$	<p>1MA subtracting 71,3 from 100 1A answer</p> <p style="text-align: right;">(2)</p>	P L1 E
		[30]	

QUESTION 2 [27 MARKS]			
Ques.	Solution	Explanation	T&L
2.1.1	Ratio = 40 : 190 ✓M = 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 = 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 = $R808 + R480$ = 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 = $R808 + R480 = R1 288,00$ ✓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 2 nd year start = $R4500 + R427,50$ = R4 927,50 ✓CA Interest year 2 = $\frac{9,5}{100} \times R4 927,50 = R468,11$ ✓CA Amount at end of 2 nd year = $R4 927,50 + R468,11$ = 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	$\text{Tax} = \frac{18}{100} \times 151\,100 \quad \checkmark M$ $= R27\,198 \quad \checkmark S$ Rebates (for 75 years or older) $= R15\,714 + R8\,613 + R2\,871$ $= R27\,198 \quad \checkmark S$ Actual tax = Tax – Rebates $= R27\,198 - R27\,198 \quad \checkmark M$ $= R0 \text{ (no tax to pay)} \quad \checkmark A$	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	$\text{Annual Income (Gross)} = R39\,486 \times 12$ $= R473\,832 \quad \checkmark M$ $\text{Annual Pension} = R473\,832 \times 7,5\% \quad \checkmark M$ $= R35\,537,40 \quad \checkmark CA$ $\text{Taxable income} = R473\,832 - R35\,537,40$ $= R438\,294,60 \quad \checkmark A$ Tax bracket 3: R337 801 – R467 500 $\text{Tax} = 70\,532 + 31\% \text{ of taxable income above R337 800}$ $= 70\,532 + \frac{31}{100} \times (438\,294,60 - 337\,800) \quad \checkmark SF$ $= 70\,532 + \frac{31}{100} \times 100\,494,60$ $= 70\,532 + 31\,153,33 \quad \checkmark S$ $= R101\,685,33 \quad \checkmark CA$ $\text{Annual Tax payable} = R101\,685,33 - \text{Primary rebate}$ $= R101\,685,33 - R15\,714$ $= R85\,971,33 \quad \checkmark MCA$	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	$\begin{aligned} \text{KZN (males)} &= 69\,000 + 99\,000 + 214\,000 \quad \checkmark\text{MA} \\ &= 382\,000 \quad \checkmark\text{CA} \end{aligned}$	1MA adding correct values 1CA answer (2)	D L1 E																				
3.1.2	$\begin{aligned} \text{Range} &= \text{Highest value} - \text{Lowest value} \\ &= 363\,000 - 34\,000 \quad \checkmark\text{RT} \quad \checkmark\text{M} \\ &= 329\,000 \quad \checkmark\text{A} \end{aligned}$	1RT correct values 1M subtraction 1CA answer (3)	D L2 E																				
3.1.3	$\begin{aligned} &\checkmark\text{M} \\ &725\,000 + 597\,000 + 143\,000 + 316\,000 + 757\,000 + 400\,000 + \\ &1\,199\,000 + 322\,000 + 277\,000 \\ &= 4\,736\,000 \\ \text{Mean} &= \frac{4\,736\,000}{9} \quad \checkmark\text{M} \\ &= 526\,222,22 \quad \checkmark\text{CA} \end{aligned}$	1M Adding values 1M dividing by 9 1CA answer (NPR) (3)	D L2 M																				
3.1.4	Provincial totals with chronic sickness (in '000') $\checkmark\text{M}$ 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 $\checkmark\text{CA}$ Median = 547 $\checkmark\text{CA}$	1M totals of the provincial numbers with chronic health conditions. 1CA arranging 1CA answer (3)	D L3 M																				
3.1.5	<p style="text-align: center;">TOTAL (IN '000') OF DIABETIC PEOPLE FROM ALL PROVINCES</p> <table border="1"> <caption>Data for Question 3.1.5</caption> <thead> <tr> <th>Province</th> <th>Number of people (in '000)</th> </tr> </thead> <tbody> <tr><td>WC</td><td>314</td></tr> <tr><td>EC</td><td>224</td></tr> <tr><td>NC</td><td>34</td></tr> <tr><td>FS</td><td>87</td></tr> <tr><td>KZN</td><td>363</td></tr> <tr><td>NW</td><td>91</td></tr> <tr><td>GP</td><td>335</td></tr> <tr><td>MP</td><td>94</td></tr> <tr><td>LP</td><td>91</td></tr> </tbody> </table>	Province	Number of people (in '000)	WC	314	EC	224	NC	34	FS	87	KZN	363	NW	91	GP	335	MP	94	LP	91	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
Province	Number of people (in '000)																						
WC	314																						
EC	224																						
NC	34																						
FS	87																						
KZN	363																						
NW	91																						
GP	335																						
MP	94																						
LP	91																						

3.1.6	Female with diabetes in KZN = 264 ✓RT Total people with chronic conditions in KZN $= 170 + 363 + 757$ ✓M $= 1\,290$ $P(\text{Female with diabetes}) = \frac{264}{1290} \times 100\%$ ✓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 = $200 + (n - 100) \times 1,20$ $= 200 + (100 - 100) \times 1,20$ ✓SF $= 200 + 0 \times 1,20$ $= R200$ ✓A	2 RT reading from given info OR 1SF substitution 1A simplification and answer (2)	F L1 M
4.1.1 (b)	Total expenses = $200 + (n - 100) \times 1,20$ ✓SF $500 = 200 + (D - 100) \times 1,20$ $500 - 200 = (D - 100) \times 1,20$ $300 \div 1,2 = D - 100$ ✓S $250 = D - 100$ $250 + 100 = D$ $350 = D$ ✓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 = $R1,75 \times 200$ ✓MA $= R350$ ✓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	$Total = 80 + 2,25 \times \frac{1500}{100} + 5 \times \frac{500}{100}$ ✓SF $= R80 + R33,75 + R25$ ✓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	$\begin{aligned} \text{VAT amount} &= \frac{\sqrt{\text{MA}}}{115} \times 1\,500 \sqrt{\text{MA}} \\ &= \text{R}195,65 \sqrt{\text{A}} \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \text{VAT exclusive price} &= \frac{100}{115} \times 1\,500 = \text{R}1\,304,35 \sqrt{\text{MA}} \\ \text{VAT amount} &= \text{R}1\,500 - \text{R}1\,304,35 \sqrt{\text{MA}} \\ &= \text{R}195,65 \sqrt{\text{A}} \end{aligned}$	<p>1MA for fraction with correct values 1MA multiplication with R1 500 1A answer. (3)</p> <p style="text-align: center;">OR</p> <p>1MA for VAT exclusive price 1MA subtracting the values 1A answer (3)</p>	F L1 M
4.2.4	Cashsend \checkmark O eWallet \checkmark O	1O explanation 1O explanation (2)	F L1 E
4.3.1	<p>Amount for 5 days = R4 042,19 \times 5 = R20 210,95 \checkmarkMA</p> <p>R5 : (¥)37,51715 R20 210,95 : ? \checkmarkM</p> $\text{Exchanged Yens} = \frac{20\,210,95 \times 37,51715}{5} \checkmark\text{M}$ <p>= ¥151 651,45 \checkmarkCA</p>	<p>1MA amount in Rands for 5 days</p> <p>1M multiplication values in numerator 1M division by 5 1CA answer (4)</p>	F L3 D
4.3.2	$\begin{aligned} \text{Daily rental fee} &= 368,6 \times 2 \times 1,82 \sqrt{\text{M}} \sqrt{\text{C}} \\ &= \text{R}1\,341,70 \sqrt{\text{CA}} \end{aligned}$	<p>1C converting cents to Rands 1M multiply correct values 1CA Answer (3)</p>	F L2 E
4.3.3	<p>100 km = 7 ℓ 1 km = 0,07 ℓ \checkmarkRT</p> $\begin{aligned} \text{Petrol cost} &= (0,07 \times \frac{\sqrt{\text{M}}}{368,6} \text{ km} \times 2) \times \text{R}19,89 \sqrt{\text{M}} \\ &= \text{R}1\,026,40 \sqrt{\text{CA}} \end{aligned}$	<p>1RT using 0,07 litres 1M number of litres of petrol 1M multiplication by R19,89 1CA answer. (4)</p>	F L3 E
		[32]	

QUESTION 5 [31 MARKS]			
Ques.	Solution	Explanation	T&L
5.1.1	$\text{Tickets for under 18} = \frac{3}{6} \times 930 \quad \checkmark \text{MA}$ $= 465 \quad \checkmark \text{A}$	1MA multiplication of fraction and 930 1A answer (2)	D L1 E
5.1.2	$\text{Amount} = \frac{60}{100} \times \frac{\checkmark \text{M}}{2} \times \frac{\checkmark \text{M}}{6} \times 930 \times 45$ $= \text{R}36\,270 \quad \checkmark \text{A}$ <p style="text-align: center;">OR</p> $\text{Tickets sold in 2021} = \frac{60}{100} \times 930 = 558 \quad \checkmark \text{M}$ $\text{Tickets for Adults} = \frac{2}{6} \times 558 = 186 \quad \checkmark \text{M}$ $\text{Costs of tickets} = 186 \times 45 = \text{R}8\,370 \quad \checkmark \text{CA}$	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 $\checkmark \checkmark \text{O}$	2O explanation (2)	D L1 E
5.2.2	Switzerland $\checkmark \checkmark \text{RT}$	2RT reading the pie chart data (2)	D L1 E
5.2.3	$100\% - (3\% + 3,6\% + 5\% + 4\% + 6\% + 8\% + 9\% + 20,5\% + 17,5\%)$ $= 23,4\% \times 1\,848\,412 \quad \checkmark \text{M}$ $= 432\,528,4 \quad \checkmark \text{S}$ $= 432\,528 \quad \checkmark \text{A}$ <p>NOT CORRECT $\checkmark \text{O}$</p>	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	$\text{Probability} = 9\% \quad \checkmark \text{RT}$ $= \frac{9}{100} \quad \checkmark \text{M}$ $= 0,09 \quad \checkmark \text{A}$	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 = $290 \times 1,33$ = R385,50 ✓A Customer pays: $50 \times 1,4472 = R72,36$ ✓MA $240 \times 1,8606 = R446,544$ ✓MA Total price paid = $R72,36 + R446,544$ = R518,90 % Profit = $\frac{R518,90 - R385,50}{R385,50} \times 100\%$ ✓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	