**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2016

MEMORANDUM

MARKS: 150

Codes	Explanation
M	Method
MA	Method with Accuracy
CA	Consistent Accuracy
A	Accuracy
C	Conversion
D	Define
S	Simplification
RT/RD/RG	Reading from a table OR a graph OR a diagram OR a map OR a plan
SF	Substitution in a formula
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding Off
NP	No penalty for rounding OR omitting units

This memorandum consists of 10 pages.

KEY TO TOPIC SYMBOLS:

F = Finance; M = Measurement; MP = Maps; Plans and other representations
DH = Data Handling; P = Probability

QUESTION 1 [34]

Ques	Solution	Explanation	Level
1.1.1	$\checkmark$M Total amount = (22 × R250) + (22 × R400) = R5 500 + R8 800$\checkmark$M = R14 300 $\checkmark$CA	1M multiply 22 by R250 and by R400 1M addition 1CA total amount (3)	**F** L1
1.1.2	$\checkmark$M Total amount = R400 + (4,75% × R400) = R400 + R19 $\checkmark$S = R419 $\checkmark$CA	1M 7,5% of R400 1S simplifying 1CA amount (3)	**F** L1
1.1.3	Amount received per member = Total bank balance – non-refundable initial fee $\checkmark$M = R110 614,84 – (250 × 22) = R110 614,84 – R 5 500,00 $\checkmark$M = R105 114,84 ÷ 22 $\checkmark$M = R4 777,95 $\checkmark$CA	1M for using R110 614,84 1M for subtracting R5 500 1M for dividing by 22 1CA simplification with correct rounding (4)	**F** L1 L2
1.2.1	$\checkmark$MA **A** = R1 799,88 ÷ 12 = R149,99$\checkmark$A	1MA divide by 12 1A unit price (2)	**F** L1
1.2.2	$\checkmark$A $\checkmark$M Total goods value = R143 988 + R1 799,88 = R145 787,88	1A correct values 1M adding values (2)	**F** L1
1.2.3	$\checkmark$A $\dfrac{R17\,494,55}{R145\,787,88} \times 100\%$ $\checkmark$M = 12,00000302% ≈ 12% $\checkmark$CA	1A correct values 1M percentage calculation 1CA percentage (3)	**F** L1

Ques	Solution	Explanation	Level

1.2.4	$\checkmark$M $\checkmark$M
	VAT = R143 988 ×14% ÷114%
	   = R17 682,73684
	   ≈ R17 682,74 $\checkmark$CA
	
	OR
	
	R143 988 = 114%
	  x = 14%
	
	$x = \dfrac{143\,988 \times 14}{114}$ $\checkmark$M
	     $\checkmark$M
	   = R17 682,73684
	   ≈ R17 682,74 $\checkmark$CA
	
	OR
	
	   $\checkmark$M
	VAT = R143 988 $-$ $\dfrac{R143\,988}{1,14}$$\checkmark$M
	   = R143 988 – R126 305,26
	   ≈ R17 682,74$\checkmark$CA
		1M multiply by 14
		1M dividing by 114
		1CA VAT amount
		
		OR
		
		1M multiply by 14
		1M dividing by 114
		1CA VAT amount
		
		OR
		
		1M subtracting
		1M dividing by 1,14
		
		1CA VAT amount
		
		              (3)
			F
			L2

1.2.5	The amount of money that the lender charges for lending the money. $\checkmark\checkmark$D	2D definition (2)	F L1

1.2.6	Interest = deferred amount × interest × 30 months p.a
	   $\checkmark$A $\checkmark$M
	   = R143 597,33 × 11,23316% × $\dfrac{30}{12}$ $\checkmark$C
	
	   = R40 326,29
		1A correct values
		1M simple interest
		1C months to years
		
		              (3)
			F
			L1

1.2.7	B = tot. cost of credit − all risks ins. − tot. deferred
	      $\checkmark$M $\checkmark$A
	   = R195 540,52 – R2 049,90 – R183 923,62
	   = R9 567 $\checkmark$CA
		1M subtracting
		1A using correct values
		1A value of A
		
		              (3)
			F
			L1

1.2.8	$\checkmark$A $\checkmark$A $\checkmark$A Fitting charges, TV Licence fee, Service fee	1A fitting 1A TV License 1A service fee (3)	**F** L1

1.2.9	$\checkmark$M $\checkmark$M
	Final instalment = R195 540,52 – (29 × R6 518,10)
	      = R195 540,52 – R189 024,90
	      = R6 515,62 $\checkmark$CA
		1M subtracting
		1M multiply by 29
		1CA final instalment
		
		              (3)
			F
			L2

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QUESTION 2 [31]

Ques	Solution	Explanation	Level
2.1.1	Outer diameter = $\dfrac{54}{100}$ $\checkmark$M $\times$ 121,92 cm = 65,8368 cm $\checkmark$CA = 658,368 mm $\checkmark$C $\approx$ 658 mm $\checkmark$R	1M % of 121,92 cm 1CA outer diameter in cm 1C conversion to mm 1R rounding (4)	**M** L1
2.1.2	Circumference of rim = 3,142 $\checkmark$SF $\times$ 584 mm = 1 834,93 mm $\checkmark$A Part of circumference filled by spokes = 24 $\times$ 2 mm = 48 mm $\checkmark$A Distance between spokes = $\dfrac{1834,93 - 48}{24\ \checkmark M}$ mm $\checkmark$M = 74,46 mm $\checkmark$CA/NP	1SF substitution 1A circumference 1A space by spoke 1M subtracting part filled by spokes 1M division by 24 1CA/NP distance apart in cm (6)	**M** L2
2.1.3	Width by wheelchair and hands = 60,96 $\times$ 10 mm = 609,6 mm $\checkmark$C Gap width = $\dfrac{750 - 609,6}{2\ \checkmark M}$ mm $\checkmark$M = 70,2 mm $\checkmark$CA	1C conversion to mm 1M difference between 750 mm and 609,6 mm 1M divide difference by 2 1CA gap width (4)	**M** L1

Ques	Solution	Explanation	Level

2.2.1	Total width = (80×4)mm + (640×2)mm
	         = 320 mm + 1 280 mm ✓M
	         = 1 600 mm ✓CA
	         = 1,6 m ✓C
	OR
	Total width = 80 + 640 + 80 + 80 + 640 + 80 mm ✓M
	         = 1 600 mm ✓CA
	         = 1,6 m ✓C
		1M adding values
		1CA width in mm
		1C conversion
		
		OR
		1M adding values
		1CA width in mm
		1C conversion
		 (3)
			M
			L1

2.2.2	✓M
	e = [2 485 mm – (80 + 640 + 95 + 95 + 220) mm] ÷ 2
	       ✓A
	   = (2 485 mm – 1 130 mm) ÷ 2
	   = 1 355 mm ÷ 2 ✓M
	   = 677,5 mm ✓CA
	
	   OR
	  ✓A ✓M
	e = (2 485 – 80 – 640 – 95 – 95 – 220) mm ÷ 2
	   = 1 355 mm ÷ 2 ✓M
	   = 677,5 mm ✓CA
		1M adding
		1A simplification
		1M divide by 2
		1CA length
		
		OR
		1A correct values
		1MA subtracting
		1M divide by 2
		1CA length
		 (4)
			M
			L1

2.2.3	✓SF ✓M ✓A
	Total area = $(640 \times 677,5 \times 4) + \left(\dfrac{3,142 \times 640^2}{2}\right)$ mm²
	              ✓M
	       ✓M
	   = 1 734 400 mm² + 643 481,6 mm²
	   = 2 377 881,6 mm² ✓CA
		1SF substitute in formulas
		1M multiply by 4
		1A identify of correct radius
		1M divide by 2
		1M adding different areas
		1CA total area
		 (6)
			M
			L3

2.2.4	✓M
	Total mass = 15 985,408 cm³ × 2,5g/cm³ ✓SF
	   = 39 963,52 g ✓A
	   = 39,96 kg ✓C
		1M change subject of formula
		1SF substitution into formula
		1A total mass in gram
		1C conversion to kg
		 (4)
			M
			L2

			[31]

QUESTION 3 [21]			
Ques	**Solution**	**Explanation**	**Level**
3.1.1	Bus stop 2 ✓✓A	2A answer (2)	**MP** L1
3.1.2	West ✓✓A	2A answer (2)	**MP** L1
3.1.3	4 and 5 ✓✓A	2A 4 and 5 (2)	**MP** L1
3.1.4	Round trip = 19:40 – 17:55 ✓M = 1 hour 45 minutes ✓A	1M subtracting 1A time taken (2)	**MP** L1
3.1.5	Arrival time at bus stop 5 = 11:52 + 13 min ✓A = 12:05 Next bus to bus stop 2 is at 12:17 ✓RT Waiting time = 12:17 – 12:05 = 12 minutes ✓CA	1A adding minutes 1RT reading correct value from table 1CA waiting minutes (3)	**MP** L2
3.1.6	✓RT 7:45 – 7:19 = 26 minutes ✓CA	1RT reading correct values 1CA time in minutes (2)	**MP** L1
3.2	Time taken = 08:23 – 08:15 = 8 minutes ✓A Distance = 43 km/h × $\left(\dfrac{8}{60}\right)$h ✓C ✓M = 43 km/h × 0,1333….. h = 5,73 km ✓CA/NP	1A time in minutes 1C conversion to hours 1M multiply speed and time 1CA/NP distance in km (4)	**MP** L2
3.3.1	B, C, A, D ✓✓A	2A correct order of instructions/diagrams (2)	**MP** L2
3.3.2	C ✓✓A	1A answer A (2)	**MP** L1
		[21]	

QUESTION 4 [27]			
Ques	**Solution**	**Explanation**	**Level**
4.1.1	Breede Valley ✓✓RT	2RT correct municipality (2)	**DH** L1
4.1.2	Difference $_{(Tlokwe)}$ = 162 762 ✓M – 128 353 ✓RT = 34 409 ✓CA	1M subtracting 1RT correct values 1CA difference (3)	**DH** L1
4.1.3	Number of elderly = 6,1% × 171 721 ✓RT = 10 474,981 ✓M ≈ 10 474 **OR** 10 475 ✓R	1RT correct values 1M percentage calculation 1R rounding (3)	**DH** L1
4.1.4	P = 100% – 14,4% ✓M = 85,6% ✓A = $\dfrac{107}{125}$ ✓CA	1M subtracting from 100% 1A probability % 1CA fraction in simplest form (3)	**P** L2
4.1.5	Blouberg ✓✓RT	2RT correct municipality (2)	**DH** L1
4.1.6	Growth rate = $\dfrac{\text{Difference in population from 2001 to 2011}}{\text{Population in 2001}} \times 100\%$ = $\dfrac{166\,825 - 146\,387}{146\,387} \times 100\%$ ✓RT ✓SF ≈ 13,96% ✓CA/NP	1RT reading from table 1SF substitution 1CA/NP rate per year (3)	**DH** L2
4.1.7	Land area size in km^2 = population ÷ population density = $\dfrac{162\,762}{61}$ km² ✓RT ✓M ≈ 2 668 km² ✓CA	1RT correct values 1M dividing 1CA rounding (3)	**M** L2
4.2.1	C ✓✓A	2A answer (2)	**DH** L1
4.2.2	Gas and nuclear = 100% ✓M – (67% + 15% + 14% + 0,3%) = 3,7 % ✓S Each contribution: 3,7 % ÷ 2 = 1,85% ✓CA	1M subtracting from 100% 1S simplification 1CA contribution (3)	**D** L1
4.2.3	Terrajoules energy supplied by petroleum = 14% ✓M × 7,3 × 1000 000 ✓RG terrajoules = 1 022 000 terrajoules ✓CA	1RG 2010 energy supply 1M percentage calculation 1CA energy (3)	**D** L1
		[27]	

       Please turn over

QUESTION 5 [37]

Ques	Solution	Explanation	Level
5.1.1	37,1 ; 31,1 ; 30,2 ; 24,6 ; 24,3 ; 24,0 ; 21,3 ; 20,6 ; 14,9 ✓✓A	2A average percentage incomes in descending order (2)	**DH** L1
5.1.2	Mean % = $\dfrac{228,1\%\ ✓A}{9\ ✓M}$ = 25,34% ✓CA ✓✓CA Provinces above mean are: KZN, WC and GP	1A adding all % 1M mean concept 1CA calculating mean % 2CA identifying 3 provinces (5)	**DH** L2
5.1.3	**Percentage income earned from the sale of electricity**		
	A = 24,0% + 19,5% = 43,5% ✓M ✓CA	1M adding 19,5% 1CA value of A	
	1A for each of the 5 correctly plotted bars		L2 (7)

                            Please turn over

Ques	Solution	Explanation	Level
5.1.4	$$P_{\text{(earned below 35\%)}} = \frac{\checkmark A}{9} \times 100\% \quad \checkmark M$$ $$\approx 22{,}2\% \quad \checkmark\text{CA/NP}$$	1A identify numerator 1M multiply by 100 1CA/NP simplification (3)	**P** L2
5.2.1	$\checkmark\checkmark A$ 0 **OR** zero **OR** impossible **OR** none **OR** 0%	2A correct probability (2)	**P** L1
5.2.2	Virgin Mobile $\quad \checkmark\checkmark\text{RT}$	2RT reading correct value from table (2)	**DH** L1
5.2.3	Profit is when your income is greater than your expenses. $\checkmark\checkmark D$	2D correct explanation/definition (2)	**F** L1
5.2.4	$\checkmark\text{MA}$ MTN R270 ÷ R15 = 18 vouchers Profit on 18 vouchers = 18 × R0,51 $\qquad\qquad\qquad\quad$ = R9,18 $\quad \checkmark\text{CA}$ Virgin Mobile R120 ÷ R15 = 8 vouchers Profit on 8 vouchers = 8 × R0,81 $\qquad\qquad\qquad\quad$ = R6,48 $\qquad \checkmark A$ Total profit for the day = R9,18 + R6,48 $\qquad\qquad\qquad\qquad$ = R15,66 $\qquad \checkmark\text{CA}$	1MA for calculating the number of vouchers 1CA for calculating the profit on selling MTN vouchers 1A for calculating the profit on selling Virgin Mobile vouchers 1CA for calculating the daily profit. (4)	**F** L3
5.2.5	Number of weeks = $\dfrac{5122{,}50}{341{,}50}$ $\checkmark M$ $\qquad\qquad$ = 15 days $\checkmark A$ $\checkmark\text{CA}$ $\qquad\qquad$ = 3 school weeks	1M division by 341,50 1A number of days 1CA number of weeks (3)	**F** L1

Ques	Solution	Explanation	Level
5.2.6	Total cost of machines = R1 539 × 52 ✓MA = R80 028 ✓CA ✓M Number of airtime vouchers = R80 028 ÷ R0,54 = 148 200 ✓CA	1MA multiply by 52 1CA simplification 1M dividing the correct values 1CA simplification (4)	**F** L1
5.2.7	✓RT Total discount = $\dfrac{3,25}{100}$ × R14 760 ✓M = R479,70 ✓CA	1RT reading correct value from table 1M multiplying 1CA discount (3)	**F** L1
			[37]

TOTAL: 150