basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2017

MARKING GUIDELINE

MARKS: 150

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/graph/diagram
SF	Correct substitution in a formula
O	Opinion/Example/Definition/Explanation
P	Penalty, e.g. for no units/incorrect rounding off, etc.
R	Rounding off
NPR	No penalty rounding or omitting units
AO	Answer only, if correct, full marks

This marking guideline consists of 16 pages.

Question 1 [30 MARKS]

Ques	Solution	Explanation	Topic/L
1.1.1	D ✓✓RT	2RT correct letter (2)	F L1
1.1.2	G✓✓ RT	2 RT correct letter (2)	D L1
1.1.3	C ✓✓ RT	2 RT correct letter (2)	M L1
1.2.1	Profit = R18 700 – R 14 960 ✓ M = R 3 740 ✓A	1M subtracting correct values 1A calculating profit **AO** (2)	F L1
1.2.2	✓M $\overbrace{10\!:\!15 + 5h50}$ = 16:05 ✓A 16:05 **OR** 4:05 pm **OR** 5 past 4 in the afternoon	1M adding 1A correct time of sale **AO** (2)	M L1
1.2.3 (a)	Radius = 32,8 mm ÷ 2 ✓MA = 16,4 mm ✓CA	1MA dividing diameter by 2 1CA radius **AO** (2)	M L1
1.2.3 (b)	Distance = (71,8 mm – 32,8 mm) ÷ 2 ✓MA = 19,5 mm ✓CA **OR** 71,8 mm ÷ 2 = 35,9 mm ✓MA Distance = 35,9 mm – 16,4 mm = 19,4 mm ✓CA	1MA subtracting and dividing 1CA distance **OR** 1MA subtracting and dividing 1CA distance **AO** (2)	M L1

Ques	Solution	Explanation	Topic/L
1.3.1	Cost of diluted juice per litre = R 44,95 ÷ 14 ℓ ✓MA = R 3, 210714286 ≈ R 3,21 ✓CA	1MA dividing 1CA cost per litre **NPR** **AO** (2)	M L1
1.3.2	2 ℓ : 12 ℓ ✓A 1 : 6 ✓CA	1A correct volume of water and order 1CA simplification **Accept** $\dfrac{1}{6}$ **AO** (2)	M L1
1.3.3	Number of glasses of juice = $\dfrac{14}{0,175}$ ✓MA = 80 ✓CA	1MA dividing the correct values 1CA simplification to a whole number **AO** (2)	M L1
1.4.1	✓RT ✓MA 35 39 39 60 63 84 93 107 117 120 126 142	1RT all values 1MA ascending order (2)	D L1
1.4.2	July **OR** 7th month ✓✓A	2A correct month (2)	D L1
1.4.3	9 ✓✓A	2A correct mode (2)	D L1
1.4.4	April **OR** 4th month ✓✓A	2A correct month (2)	D L1
1.4.5	✓A May and July ✓A **OR** 5th month and 7th month	1A May 1A July (2)	D L1
		[30]	

QUESTION 2 [46 MARKS]

Ques	Solution	Explanation	Topic/L
2.1.1	R465,00 ✓✓RT	2RT correct bus fare (2)	F L1
2.1.2	Queenstown ✓RT and King William's Town ✓RT	2RT correct cities (2)	F L1
2.1.3 (a)	Port Elizabeth to Bloemfontein = R435,00 ✓RT Cost = R755,00 – R435,00 = R320,00 ✓CA	1RT R435 1CA cost **Accept** trial and error method AO (2)	F L1
2.1.3 (b)	King William's Town ✓✓RT	**CA from Q2.1.3(a)** 2RT correct city (2)	F L2

2.1.4	Cost excluding VAT
	= R365,00 × $\dfrac{100✓M}{114}$ ✓M
	
	= R320,175… ≈ R320,18 ✓CA
	
	OR
	
	Cost excluding VAT
	= $\dfrac{R365}{1,14}$ ✓M ✓MA ≈ R320,18 ✓CA
	
	OR
	
	114 : 365 = 100 : x x = price excl. VAT ✓M
	
	   x = R365,00 × $\dfrac{100}{114}$ ✓M
	     = R320,175… ≈ R320,18 ✓CA
	
	OR
	VAT = R365 × $\dfrac{14}{114}$ ✓M = R44,82
	
	Cost excluding VAT = R365 – R44,82 ✓M ≈ R320,18 ✓CA
		1M × 100
		1M ÷ 114
		
		1CA simplification
		
		OR
		
		1M dividing
		1MA 1,14
		1CA simplification
		
		OR
		
		1M proportion
		
		1M x as subject of formula
		1CA simplification
		OR
		
		1M multiplying with ratio
		
		1M subtracting VAT
		1CA simplification
		NPR
		AO (3)
			F L2

Ques	Solution	Explanation	Topic/L

2.1.5	From Queenstown to Bloemfontein return trip
	
	     ✓RT
	 = R410 × 2
	
	 = R820 ✓CA
	
	 Total travelling cost
	
	 = 12 × R820 ✓M
	
	 = R9 840 ✓CA
	
	 OR
	 Number of trips = 2 × 12 ✓M
	
	          = 24 ✓CA
	
	 Total travelling cost = 24 × R410 ✓RT
	
	          = R9 840 ✓CA
	
	 OR
	 One way cost for a year
	    ✓RT
	 = R410 × 12 ✓M
	
	 = R4 920
	
	 Total traveling cost
	
	 = R4 920 × 2 ✓M
	
	 = R9 840 ✓CA
	 OR
	      ✓RT ✓M
	 Traveling cost = R410 × 2 × 12 ✓M
	
	          =R9 840 ✓CA
		1RT correct fare
		
		 1CA for calculating the return trip
		
		 1M multiplying by 12
		
		 1CA total cost
		
		 OR
		
		 1M multiplying by 12
		
		 1CA total trips
		
		 1RT correct fare
		
		 1CA total cost
		
		 OR
		
		 1RT correct fare
		 1M multiplying with 12
		
		 1M multiplying with 2
		
		 1CA total cost
		
		 OR 1RT correct fare
		 1M multiplying with 2
		 1M multiplying with 12
		 1CA cost
		 AO
		
		              (4)
			F
			 L2

Ques	Solution	Explanation	Topic/L
2.2.1	✓RT July 2013 **OR** 07/2013 **OR** 07/13 ✓RT	1RT month 1RT year (2)	F L1
2.2.2	Water and Sewerage ✓RT Refuse Removal ✓RT	1RT water and/or sewerage 1RT refuse Penalty for including property rates (2)	F L1
2.2.3	November = 3 days, December = 20 days ✓M end date 2016/12/20 **OR** 20 December 2016 ✓A	1M adding 1A end date 20 Dec **Accept** 19 Dec AO (2)	F L1

2.2.4	Daily average consumption
	  ✓RT
	= 12,00 kℓ ÷ 23 days ✓M
	
	≈ 0,522 kℓ
	
	OR
	
	Verifying the consumption rate per day:
	  ✓RT
	= 12,00 kℓ ÷ 0,522 kℓ/day ✓M
	
	≈ 23 days
	OR
	
	0,522 kℓ/day × 23 days ✓M
	≈ 12,00kℓ ✓A
		1RT correct value
		1M dividing in correct order
		
		OR
		
		1RT correct value
		1M dividing in correct order
		
		OR
		
		1M multiplying
		1A volume
		(2)
			F
			L1

2.2.5	Water ✓R The amount of water consumption is not the same every month. ✓✓O	1R variable expense 2O explanation clearly showing change (3)	F L1

Ques	Solution	Explanation	Topic/L
2.2.6 (a)	$A = R690\,000 \times \overset{\checkmark RT}{R0,0069160} \div 12$ $= R397,67\ \checkmark CA$	1RT all values from bill 1CA simplification Note value for B can be used to calculate A **AO** (2)	F L1
2.2.6 (b)	$B = R397,67 - R115,27\ \checkmark M$ $= R282,40\ \checkmark CA$ **OR** $B = R880,10 - R167,58 - R430,12\ \checkmark M$ $= R282,40\ \checkmark CA$	1M subtracting correct values 1CA simplification **OR** 1M subtracting correct values 1CA simplification **AO** (2)	F L1
2.2.7	Sewerage rate per m² $= \dfrac{R298,36}{463}\quad \checkmark RT$ $= R0,6444060475\quad \checkmark A$ $\overset{\checkmark RT}{}$ **OR** $463\text{m}^2 :\ R\,298,36$ $1\text{m}^2\quad : R0,6444\dots\ \checkmark A$	1RT correct values 1A simplification **OR** 1RT Correct values 1A simplification **NPR** **AO** (2)	F L1
2.2.8	R919,33 $\checkmark\checkmark RT$	2RT unpaid amount (2)	F L1
2.2.9	Rounding up $\checkmark\checkmark A$ **OR** Rounding (off) to the nearest R10,00 $\checkmark\checkmark A$ **OR** Rounding (off) to the nearest R100,00 $\checkmark\checkmark A$	2A Rounding up **OR** 1A rounding 1A nearest 10 rand **OR** 1A rounding 1A nearest 100 rand (2)	F L1
2.3.1	Commission $= 1,95\% \times £360,00\ \checkmark MA$ $= £7,02\ \checkmark A$	1MA calculating % 1A commission in pound **AO** (2)	F L1

Ques	Solution	Explanation	Topic/L
2.3.2	$£360,00 = \dfrac{360}{0,05773}$ ✓M/A $= R6\ 235,9258..$ ✓A $\approx R6\ 235,93$ or $R6\ 235$ or $R6\ 236$ ✓CA **OR** $£1 = \dfrac{R1,00}{0,05773}$ $= R17,32201628$ ✓MA $£360 = R17,32201628 \times 360$ $= R62\ 35,925862$ ✓A $\approx R6\ 235,93$ ✓CA OR $R1,00 = £0,05773$ $x = £360,00$ $x = R\dfrac{1 \times 360}{0,05773}$ ✓A ✓MA $= R6\ 235,93$ ✓CA	1MA conversion 1A simplification 1CA rounding **OR** 1MA conversion 1A simplification 1CA rounding **OR** 1A multiplying with 360 1MA conversion 1CA rounding **NPR** AO (3)	F L2
2.3.3	Interest after 1 year $= R5\ 000 \times 6,3\%$ $= R315$ ✓M Amount after year 1 $= R5\ 000 + R315$ $= R5\ 315,00$ ✓A Interest for full 2nd year $= R5\ 315 \times 6,3\%$ $\approx R334,845$ ✓CA $\therefore$ Interest for $\frac{1}{2}$ year $= R334,845 \div 2$ $= R167,42$ ✓M Value of the fixed deposit $= R5\ 315 + R167,42$ $= R5\ 482,42$ ✓CA **OR**	1M calculate interest for first year 1A simplification 1CA 2nd year amount 1M half year interest 1CA simplification **OR**	F L2

Ques	Solution	Explanation	Topic/L
	Interest after 1 year = R5 000 × 6,3% = R315 ✓M	1M calculate interest for first year	
	Amount after year 1 = R5 000 + R315 = R5 315,00 ✓A	1A simplification	
	Second year interest rate = $\dfrac{6,3\%}{2}$ ✓M	1M 2nd year rate	
	= 3,15% ✓CA Interest for $\frac{1}{2}$ year = R5 315 × 3,15% ≈ R167,42	1CA half year interest	
	Value of the fixed deposit = R5 315 + R167,42 = R5 482,42 ✓CA	1CA simplification	
	OR	**OR**	

	Amount after year 1 = R5 000 (1 + 0,063)✓M
	
	       = R5 315,00 ✓A
	                    ✓CA
	Value of fixed deposit after 1$\frac{1}{2}$ years
	
	     = $R5\,315\left(1+\dfrac{0,063}{2}\right)$ ✓M
	
	     ≈ R5 482,42 ✓CA
		1M calculate amount for first year
		1A simplification
		
		1CA 2nd year amount
		
		1M half year
		
		1CA simplification
		               (5)	

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QUESTION 3 [21 MARKS]

Ques	Solution	Explanation	Topic/L
3.1.1	Number of tables $= 240 \div 8 = 30$ ✓A Number of balloons $= 4 \times 30 = 120$ ✓CA	1A correct number of tables 1CA minimum number of balloons **AO** (2)	M L1
3.1.2	Length of decorative ribbon in cm $= 2 \times (\text{length} + \text{width}) + 1$ ✓✓SF $= 2 \times (10 + 6) + 1 = 33$ ✓A	2SF substituting correct values into the formula 1A minimum length **AO** (3)	M L2

3.1.3	Volume $= \pi \times (\text{radius})^2 \times \text{height}$
	          ✓A ✓SF
	     $= 3{,}142 \times (6\text{ cm})^2 \times 28\text{ cm}$
	
	$= 3\,167{,}136\text{ cm}^3$ ✓CA
		1A radius
		1SF correct height and 3,142
		
		1CA simplification
		NPR
		
		(3)
			M
			L2

3.1.4	✓A
	Volume $= 1\,680\text{ cm}^3 \times 45\% = 756\text{ cm}^3$
	
	Mass of sand $= 756\text{ cm}^3 \times 1{,}53\text{g/cm}^3$ ✓M
	           ✓CA
	        $= 1\,156{,}68\text{ g} \div 1\,000$
	
	       $\approx 1{,}16\text{ kg}$ ✓C
	
	          OR
	$1{,}53\text{ g/cm}^3 = 0{,}00153\text{ kg/cm}^3$ ✓C
	                   ✓A
	Volume $= 1\,680\text{ cm}^3 \times 45\% = 756\text{ cm}^3$
	                    ✓M
	Mass of the sand $= 0{,}00153\text{ kg/cm}^3 \times 756\text{ cm}^3$
	
	        $= 1{,}15668\text{ kg} \approx 1{,}16\text{ kg}$ ✓CA
	
	          OR
		1A calculating 45%
		
		1M multiply by rate
		
		1CA mass in grams
		
		1C converting to kg to 2decimal places
		
		         OR
		1C converting to kg
		1A calculating 45%
		
		1M multiplying with the rate
		
		1 CA mass in kg to 2 dec. places
		         OR
			M
			L2

Ques	Solution	Explanation	Topic/L
	Mass of sand in a full vase = 1 680 cm^3 × 1,53g/cm^3 ✓M = 2 570,4 g ✓A = 2,5704 kg ✓C Mass of sand if filled to 45% = 2,5704 kg × 45% = 1,16 kg ✓CA	1M multiplying with the rate 1A mass 1C conversion 1CA mass of sand to two decimal places (4)	
3.2.1	Area of triangle = $\overset{\checkmark A}{\frac{1}{2}} \times 4\ \text{cm} \times \overset{\checkmark RT}{3{,}464\ \text{cm}}$ = 6,928 cm^2 ✓CA	1A substituting correct values in formula 1RT height 1CA simplification **NPR** AO (3)	M L2
3.2.2	Total surface Area of a triangular prism $\overset{\checkmark CA}{= 2 \times 6{,}928} + \overset{\checkmark SF}{3 \times 6\ \text{cm} \times 4\text{cm}}$ = 13,856 cm^2 + 72 cm^2 ✓CA = 85,856 cm^2 ✓CA	**CA from Q3.2.1** 1CA substituting area of triangle 1SF substituting correct values in formula 1CA simplification 1CA total surface area (4)	M L3
3.2.3	30 minutes = 1 800 seconds ✓C Average time to cover 1 box = $\dfrac{1\ 800}{20}$ seconds = 90 seconds ✓CA **OR** Average time to cover 1 box = $\dfrac{30\ \text{min}}{20}$ = 1,5 min ✓M = 1,5 min × 60 sec/min = 90 seconds ✓C	1 C conversion to seconds 1CA simplification **OR** 1M time per box 1C conversion AO (2)	M L1
		[21]	

QUESTION 4 [27 MARKS]

NOTE :MPU & NC maximum [23 MARKS] to be scaled to 27 MARKS

Ques	Solution	Explanation	Topic/L
4.1.1	✓✓A Bar scale **OR** Scaled bar **OR** Linear scale **OR** Graphical scale	2A identifying type of scale (2)	M&P L1
4.1.2	Top view **OR** Aerial view **OR** Bird's eye view✓✓A **OR** Satelite view	2A correct view of the map (2)	M&P L1
4.1.3	✓✓A South East **OR** SE **OR** East of South	2A identifying correct direction (2)	M&P L1
4.1.4	5 ✓✓A	2A exact number of medical points **Accept** 4 (2)	M&P L2
4.1.5	✓A ✓A Mowbray and Observatory	2A identifying correct suburbs **Accept** Maitland and Saltriver (2)	M&P L1
4.1.6	✓A ✓A ✓A Castle De Goede Hoop, Old Biscuit Mill , Planetarium **OR** 4, 5 and 6	3A identifying correct tourist attractions (3)	M&P L2

Ques	Solution	Explanation	Topic/L
4.2.1	D; B; E; A; C ✓A $\underbrace{}$ ✓A	**NOTE:** **[MPU & NC not to be marked]** 1A order BEA 1A end with C (2)	M&P L2
4.2.2	E **OR** B ✓✓A	**NOTE:** **[MPU & NC not to be marked]** 2A correct letter (2)	M&P L1
4.2.3 (a)	✓✓A 0 % **OR** Impossible **OR** 0 **OR** $\dfrac{0}{130}$ **OR** None	2A probability (2)	P L2
4.2.3 (b)	Total blocks = 20 + 25 + 28 + 30 + 27 = 130 ✓A Probability of taking out a blue block = $\dfrac{25}{130}$ ✓A ✓A **OR** $\dfrac{5}{26}$ **OR** 19,23% **OR** 0,19	1A total 130 1A numerator 1A denominator **AO** (3)	P L2
4.2.4 (a)	Number of layers = 35 cm ✓MA ÷ 16, = 2,12… ≈ 2 ✓CA	1MA dividing correct values 1CA exact number of layers **AO** (2)	M&P L1
4.2.4 (b)	Number of cans which can be packed lengthwise = 56 cm ÷ 12,6 cm ✓MA = 4,444… ≈ 4 Number of cans which can be packed width-wise = 41 cm ÷ 12,6 cm = 3,253… ≈ 3 ✓A Maximum number of cans = 4×3×2 = 24 ✓CA	1MA dividing the width or length by 2,6 1A rounding both down to whole numbers 1CA for max number of cans **AO** (3)	M&P L3
		[27]	

QUESTION 5 [26 MARKS]

Ques	Solution	Explanation	T/L
5.1.1	Broken line graph **OR** line graph ✓✓A	2A correct type of graph (2)	D L1
5.1.2	Number of candidates = 287 453 + 389 615 ✓M $= 677\ 068$ ✓CA	1M adding Math and Math Lit 1CA max number of candidates **AO** (2)	D L2
5.1.3	100% **OR** 1 **OR** certain **OR** definite ✓✓A	2A correct probability (2)	P L2
5.1.4	Accounting, Business Studies, Economics and ✓RT ✓RT ✓RT Mathematical Literacy	1RT 1st subject 1RT 2nd subject 1RT last two subjects (3)	D L1
5.1.5	Mathematics ✓✓RT	2RT correct subject (2)	D L1
5.1.6	✓✓A The data of one variable is grouped into subjects **OR** The data of one variable is not numerical ✓✓A	2A explanation (2)	D L1
5.1.7	Business Studies ✓✓RT	2RT correct subject (2)	D L1

Ques	Solution	Explanation	T/L
5.2.1	Copyright payments, advertising costs, bursary, ✓✓O grants etc. (OR any other valid expenditure)	2O an example of other type of expenditure (2)	D L1
5.2.2	Donations ✓M $= [R63 – (R27,09 + R21,02 + R3,78)]$ billion $= R11,11$ billion ✓CA Percentage donations $= \dfrac{11,11}{63} \times 100\%$ $\approx 17,6\%$ ✓CA **OR** $R27,09 + 21,02 + 3,78$ $= R51,89$ billion Percentage income shown $= \dfrac{R51,89}{R63} \times 100\%$ $\approx 82,4\%$ ✓M Percentage donations $=100\% – 82,4\%$ ✓M $=17,6\%$ ✓CA **OR** Percentage $= \dfrac{R27,09}{R63} \times 100\% = 43\%$ ✓M $\dfrac{R21,02}{R63} \times 100\% \approx 33,365\%$ $\dfrac{R3,78}{R63} \times 100\% = 6\%$ Percentage donations $= 100\% – (43\% + 33,4\% + 6\%)$ ✓M $= 17,6\%$ ✓CA	1M subtracting from R63 billion 1CA simplification in billions 1CA donations as a % **OR** 1M percentage income shown 1M subtracting from 100% 1CA simplification **OR** 1M percentage calculation 1M subtracting from 100% 1CA simplification **NPR** AO (3)	D L2

Ques	Solution	Explanation	T/L
5.2.3	✓RT Interest in Rand = 54 100 000 000 × 0,7% ✓M ✓CA = 378 700 000 OR 378,7 million **OR** ✓RT Interest in rand = 54,1 billion × 0,7% ✓M = 0,3787 billion ✓CA = 378 700 000 OR 378,7 million	1RT correct amount 1M multiplying with 0,7% 1CA interest amount **OR** 1RT correct amount 1M multiplying with 0,7% 1CA interest amount AO (3)	F L1
5.2.4	Difference = income – expenditure ✓M = R63 billion – R54,1 billion = R8,9 billion ✓CA ✓C = R8 900 million **OR** R8 900 000 000 **OR** Difference = income – expenditure ✓M ✓C = R63 000 million – R54 100 million ✓CA = R8 900 million **OR** R8 900 000 000	1M subtracting 1CA simplification in billions 1C for difference in millions **OR** 1M subtracting 1C converting to millions 1CA difference in millions (3)	D L2
		[26]	
		TOTAL: 150	