Province of the
EASTERN CAPE
EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2019

MATHEMATICAL LITERACY P2 MARKING GUIDELINE

MARKS: 150

Symbol	Explanation
M	Method
M/A	Method with accuracy
MCA	Method with consistent accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table OR Reading from a graph OR 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 OR Reason
AO	Answer only
NPR	No penalty for rounding

This marking guideline consists of 10 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.*

QUESTION 1 [37]			
Ques.	**Solution**	**Explanation**	**Topic & Level**
1.1.1	✓RT ✓M Interest Amount = R749 299,39 × $\frac{0{,}8125\%}{100}$ ✓A = R6 088,06 **OR** ✓RT ✓M ✓A Interest Amount = R749 299,39 × 0,008125 = R6 088,06	1RT Correct opening balance 1M Multiply 1A Monthly rate (3)	L2 F
1.1.2	Monthly repayment = $\frac{750\,000}{1\,000}$ ✓M × 8,59 ✓RT = R6 442,50 **OR** ✓RT ✓RT Monthly repayment = 750 000 × 8,59 = $\frac{6\,442\,500}{1\,000}$ ✓M = R6 442,50	1RT Home loan 1M Divided by 1 000 1RT Correct factor 1RT Home loan 1RT Correct factor 1M Divided by 1 000 (3)	L2 F
1.1.3	Closing balance for Month 3 = R749 299,39 + R6 088,06 – R6 442,50 ✓A = R748 944,95 ✓A	1A Add and Subtract 1A Closing balance (2)	L2 F
1.1.4	Statement not valid ✓R ✓R The shorter the loan period, the higher the monthly repayment ✓R **OR** ✓R The shorter the loan period, the higher the loan factor **OR** No ✓A ✓R ✓R The loan factors are higher with shorter periods **Accept any other relevant response**	1A Not valid 1R Shorter period 1R Higher MRP 1A No 1R Higher loan factor 1R Shorter periods (3)	L4 F
1.1.5	Amount at 119 months = R6 442,50 × 119 = R766 657,50 ✓CA Difference = R766 657,50 – R750 000 ✓M = R16 657,50 ✓CA Statement valid ✓O	1MA Multiplying correct values 1CA Amount 1M Subtraction 1CA Difference 1O Valid (5)	L4 F
1.1.6	It will reduce the interest amount. **Accept any other relevant response**	2A Explanation (2)	L4 F
1.2.1	✓C Volume = 2 m × 2 m × 0,3 m ✓SF = 1,2 m^3 ✓CA	1SF Substitution 1C Convert mm to m 1CA Answer in m^3 (3)	M L2

1.2.2	Bags of cement = $\frac{1,2}{0,26}$ ✓M = 4,615384615 × 2 ✓M = 9,2 bags ✓S ≈ 10 bags ✓CA **OR** 0,26 = 2 bags 1,2 = $\frac{2}{1}$ ✓M × $\frac{1,2}{0,26}$ ✓M = 9,2 bags ✓S = 10 bags ✓R	**CA from 1.2.1** 1M Ratio concept 1M Multiply by 2 1S Simplification 1R Number of bags 1M Ratio concept 1M Multiply by 2 1S Simplification 1R Number of bags (4)	M L3
1.2.3	Litres of paint needed = 15 × 1,08 = 16, 2 m^2 ✓MA = $\frac{16,2}{5}$ ✓M = 3,24 litres = 3,24 litres × 2 = $\frac{6,48}{5\text{-}litre\ tins}$ ✓CA = 1,296 tins Number of 5-litre tins = 2 tins ✓CA **OR** Litres of paint needed = 15 × 108% = 16,2 m^2 ✓MA Two coats = 16,2 × 2 = 32,4 m^2 ✓CA Number of 5-litre tins = $\frac{32,4}{5\text{-}litre\ tins}$ ✓MM = 6,6 litres = 2 × 5 litres ✓CA	1MA Increased surface area 1M Dividing by spread rate 1CA Total number of litres 1CA Number of 5-litre tins 1MA Increased surface area 1CA Two coats 1M Dividing 1CA Number of 5-litre tins (4)	M L3
1.3.1	Price for 2015 = 1 251 158,39 + (1 251 158,39 × 0,05) ✓MA = 1 251 158,39 + 62 557,9195 ✓S = R1 313 716,31 ✓CA Price for 2016 = 1 313 716,31 + (1 313 716,31 × 0,04) = 1 313 716,31 + 52 548,65238 = R1 366 264,96 ✓CA **OR** Price from 2015 – 2016 = 1 251 158,39 × 1,05 ✓M × 1,04 ✓M ✓S = R1 366 264,96 ✓CA	1MA Increase by 5% 1S Simplification 1CA Amount 2015 1CA Amount 2016 (4)	L3 F
1.3.2	Percentage change = $\frac{1\,598\,366,77 - 1\,029\,331}{1\,029\,331}$ ✓RG × 100% = $\frac{569\,035,77}{1\,029\,331}$ ✓RG × 100% = 0,5528… × 100% ✓S = 55% ✓R	1RG Subtract correct values 1RG Correct denominator 1S Simplification 1R Nearest % (4)	L3 F
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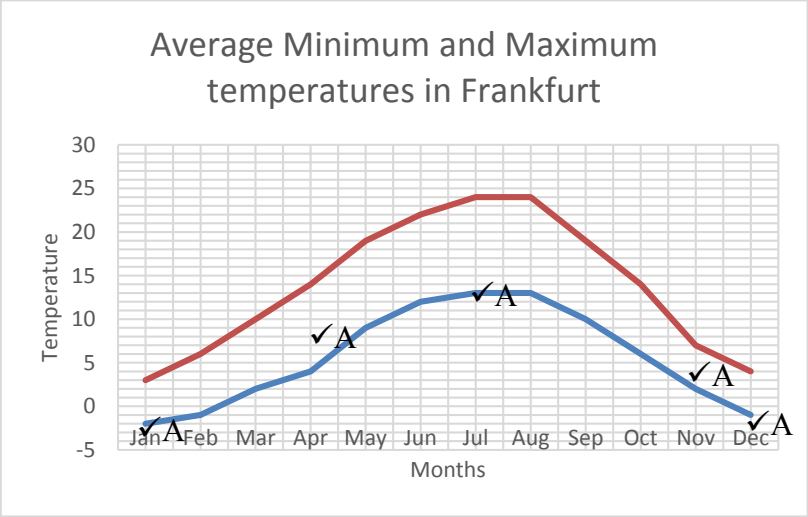
QUESTION 2 [36]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
2.1.1	Taxable Income = Gross Annual salary – Pension = 401 137,75 – (0,075 × 401 137,75)✓M = 401 137,75 – 30 085,33 ✓S = R371 052,42 ✓CA	1M Subtract 7,5% 1S Simplification 1CA Taxable Income (3)	L2 F
2.1.2	Annual Tax ✓A = 63 853 + 31% of taxable income above 305 850 = 63 853 + 0,31 × (371 052,42 – 305 850) ✓SF = 63 853 + 0,31 × 65 202,42 = 63 853 + 20 212,75 = 84 065,75 ✓S – 13 635 ✓M = 70 430,75 – 12 456 ✓M = R57 974,75 ✓CA Annual School fees = 2 500 × 11 + 3 200 × 11 ✓MA = 27 500 + 35 200 = R62 700✓CA Claim not valid ✓O	**CA from 2.1.1** 1A Correct Rates of Tax 1SF Substitution 1S Simplification 1M Subtract rebate 1M Subtract MAC 1CA Annual tax 1MA School fees × 11 1CA Annual School fees 1O Invalid (9)	L4 F
2.2.1	Probability other than African = 8,8% + 9,5% + 2,4% = 20,7% ✓A **OR** Probability other than African = 100% – 79,3%✓M = 20,7% ✓CA	1MA Adding correct values 1A Probability 1M Subtract from 100 1CA Probability (2)	L2 P
2.2.2	African % = 100% – 8,8% – 9,5% – 2,4%✓MA = 79,3% ✓A African Population in 2004 = 79,3% × 46,66 million ✓MCA = 37, 001 380 million ✓CA **OR 37 001 380** African Population in 1911 = 67,3% × 5 972 757 = 401 9665,46 ✓CA Difference = 37 001 380 – 401 9665,46✓M = 32 981 714, 54 ≈ 32 981 714 ✓CA	1MA Subtract from 100 1A African % 1MCA Calculate % 1CA Total for 2004 in millions 1CA Total for 1911 1M Subtract 1CA Difference **NPR** (7)	L3 D
2.2.3	1911 = 0,08 × 5 972 757 = 477 820,56 ✓CA 2004 = 0,08 × 46 660 000 = 3 732 800✓CA	1MA % for 1911 1CA Coloured population 1911 1CA Coloured population 2004 (3)	L2 D
2.2.4	Percentage of the African race group increased Percentage of the Indian race group decreased ✓A	1A African increase 1A Indian decrease (2)	L4

2.3.1	Number of people = (25 × 2) + 17 = 50 + 17 ✓MA = 67 people ✓CA	1MA × 2 and addition 1CA Number of people (2)	L2 D
2.3.2	Cost for Option 1 = 1 500 + (250 × 67) = 1 500 + 16 750 = R 18 250 ✓CA Cost for Option 2 ✓MA ✓MCA Cost for couples = 0,96 × 270 × 50 = R12 950 ✓CA Cost for singles = 270 × 17 = R4 590 ✓CA Total for couples and singles = R12 950 + R4 590 = R 17 550 ✓CA Statement invalid ✓O	**CA from 2.3.1** 1MCA Adding and Multiplying 1CA Option 1 cost 1MA % decrease 1MCA × 50 1CA Couples cost 1CA Singles cost 1CA Option 2 cost 1O Invalid (8)	L4 F
		[36]	

QUESTION 3 [39]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
3.1.1	North West **OR** West of North ✓✓A	2A Direction (2)	M&PL2
3.1.2	✓A Scale: 3,8 cm = 20 miles Distance = 8,6 cm ✓A Actual distance = $\frac{20}{3,8}$ × 8,6 ✓M = 45,263 miles ✓CA	1A Measure scale 1A Measured distance 1M Dividing and multiplying 1CA Distance to 3 dec places **Scale Measured Accept 3,6 – 4 cm** **Measured distance Accept 8,4 – 8,8 cm** (4)	M&PL3
3.1.3	3,8 cm = 20 miles Convert miles to kilometres = 20 miles × 1,609 = 32,18 km ✓MA Convert km to cm = 32,18 × 100 000 = 3 218 000 cm ✓MA Unit scale = 3,8 cm : 3 218 000 cm = 1 cm : 848 842,1053 ✓S ≈ 1 : 1 000 000 ✓R	**CA from 3.1.2** 1MA Convert to miles to km 1MA Convert km to cm 1S Simplification 1R Nearest million **Penalise for units in unit ratio** (4)	M L3
3.1.4	Noise pollution **OR** Air pollution ✓✓R **OR** Danger ✓✓R **OR** Length of runways ✓✓R **Accept any other relevant answer**	2R Reason (2)	M&PL4
3.1.5	A 61	2A Road (2)	M&PL2
3.1.6	Distance = Speed × Time 78 miles = 40 miles per hour × Time ✓SF Time = ✓M $\frac{78}{40}$ = 1,95 hours ✓S Time in hours and minutes = 1h 57 minutes ✓C Arrival time = 07:20 + 1:57 ✓M = 09:17 ✓CA Statement invalid ✓O **OR** Time = $\frac{Distance}{Speed}$ ✓M Time = $\frac{78}{40}$ ✓SF = 1,95 hours ✓S = 1h 57 minutes ✓C Travel time = 7:20 to 9:15 = 1h 55 minutes ✓M ✓O Not valid, she will be 2 minutes late ✓O	1SF Substitution 1M Changing subject of the formula 1S Time in hours 1C Time in hours and min 1M Adding times 1CA Arrival time 1O Invalid 1M Changing subject of the formula 1SF Substitution 1S Time in hours 1C Time in hours and min 1M Travel time 1O Not valid 1O 2 min late (7)	M L4

3.2.1	Range = Highest – Lowest 15°C = 13°C – Lowest ✓M Lowest = 13°C – 15°C ✓RT = -2°C ✓A	1M Concept of range 1RT Correct values 1A Lowest value (3)	D L2
3.2.2 (a)	Mistakes: Data was not arranged ✓A Calculation was done without using the BODMAS-rule ✓A	1A Mistake 1 1A Mistake 2 (2)	D L3
3.2.2 (b)	Correction: 3 ; 4 ; 6 ; 7 ; 10 ; 13 ; 14 ; 19 ; 19 ; 22 ; 24 ; 24 ✓M Median = $\frac{13+14}{2}$ = $\frac{27}{2}$ = 13,5 °C ✓A	1M Arrange data ascending or descending 1A Median (2)	D L3
3.2.3	June, July and August ✓A Minimum temperatures are high ✓R Maximum temperatures are high ✓R	1A Correct months 1R Min high 1R Max high (3)	D L4
3.2.4	Probability = $\frac{5}{12}$ ✓A ✓A = 0,4166… = 0,417 ✓CA	**CA from 3.2.1** 1A Numerator 1A Denominator 1CA 3 dec places (3)	P L2
3.2.5		**CA from 3.2.1** 1CA January 1A Feb – Apr 1A May – Jul 1A Aug – Nov 1A Dec (5)	D L2
		[39]	

QUESTION 4 [38]			
Ques.	**Solution**	**Explanation**	**Topic and Level**
4.1.1	Area of unshaded part = Area of rectangle – Area of ▲1 – Area of ▲2 = (Length × Width) – ($\frac{1}{2}$ × base × height) – ($\frac{1}{2}$ × base × height) ✓SF ✓SF ✓SF = (130 cm × 25 cm) – (0,5 × 50 cm × 25 cm) – (0,5 × 50 cm × 15 cm) = 3 250 cm^2 – 625 cm^2 – 375 cm^2 ✓M ✓S = 2 250 cm^2 ✓CA × 5 ✓M Total area = 11 250 cm^2 ✓CA **OR** Area of rectangle = Length × Width Area of 5 panels = 130 cm × 25 cm ✓SF = 32 500 cm^2 × 5 ✓M = 16 250 cm^2 ✓CA Area of ▲1 (5 panels) = $\frac{1}{2}$ × base × height = 0,5 × 50 cm × 25 cm × 5 ✓SF = 3 125 cm^2 ✓CA Area of ▲2 (5 panele) = $\frac{1}{2}$ × base × height = 0,5 × 50 cm × 15 cm × 5 = 1 875 cm^2 ✓CA Total Area = 16 250 cm^2 – 3 125 cm^2 – 1 875 cm^2 ✓M = 11 250 cm^2 ✓CA	1SF Correct values for rectangle 1SF Correct values ▲1 1SF Correct values for ▲2 1M Subtracting 1S Simplification 1CA Area of unshaded part 1M Multiply by 5 1CA Total area **OR** 1SF Correct values for rectangle 1M Multiply by 5 1CA Area of rec 1SF Correct values ▲1 1CA Area of ▲1 1CA Area of ▲2 1M Subtracting 1CA Area of unshaded part (8)	M L3
4.1.2	To glue the seams together **OR** To paste sides together ✓✓R	2R Reason (2)	M L4
4.1.3	Diagram T – A ring should be attached to the wide side of the hot air balloon ✓A Diagram U – A paper clip to be attached to the ring ✓A	1A Explain Diagram T 1A Explain Diagram U (2)	M&P L2
4.1.4	To blow hot air in balloon	2R Reason (2)	M&P L4
4.2.1	✓✓A When the temperature increases, the lift of the hot air balloon is higher. ✓✓A ✓✓A **OR** ✓✓A When the temperature decreases, the lift of the hot air balloon is lower.	2A Temperature increases 2A Hot air balloon higher (4)	M&P L4

4.2.2	Air Density of Hot air balloon B = $\frac{0,972+0,946}{2}$ = $\frac{1,918}{2}$ ✓MA = 0,959 kg/m^3✓CA Lift = (Air density outside of the hot air balloon – Air density inside hot air balloon) × Volume of the hot air balloon ✓RT ✓RT Lift = (1,204 kg/m^3 – 0,959 kg/m^3) × 2 400 m^3 ✓SF = 0,245 kg/m^3✓S × 2 400 m^3 = 588 kg ✓CA	1MA Concept of average 1CA Air Density 1RT Correct outside air density 1RT Correct inside air density 1SF Substitution 1S Simplification 1CA Lift (7)	M L4
4.2.3	Probability = $\frac{33+12}{93}$ = $\frac{45}{93}$ ✓A = $\frac{15}{31}$ ✓A ✓CA	1A Numerator 1A Denominator 1CA Common fraction in the simplest form (3)	P L2
4.3	Accommodation = 1 030 × 4 nights × 4 people ✓A = R16 480 ✓CA Hot air balloon rides = 750 – (750 × 0,15) ✓MA = 750 – 112,50 ✓S Cost per person = R637,50 × 4 = R2 550✓CA Total cost in Rand = R16 480 + R2 550 = R19 030✓CA Cost in USD = $\frac{19\,030}{13,63}$ ✓C = \$1 396, 184886✓CA Cost in Turkish Lira = \$1 396,184886 × 5,25 ✓M = 7 329,97 Turkish Lira ✓CA	1A 4 nights × 4 1CA Cost for accommodation 1MA Less 15% 1S Cost per person 1CA Cost for rides 1CA Total cost 1C Dividing 1CA Cost in USD 1M Multiply 1CA Cost in Turkish Lira (10)	F L3
		[39]	
		TOTAL:	**150**