Province of the EASTERN CAPE EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2021

MATHEMATICAL LITERACY P2 MARKING GUIDELINE

MARKS: 150

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

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 aflees van 'n grafiek, tabel, uitlegplan en kaart en ekstra antwoorde gee, penaliseer vir elke ekstra item.

KEY TO TOPIC SYMBOL:
F = Finance; M = Measurement; MP = Maps, plans and other representations; P= Probability

QUESTION 1 [26 MARKS]

Quest	Solution	Explanation	Level
1.1.1	25 mg : 1 000 mg ✓M (divide by 25) = 1 : 40 ✓MA	1M ratio concept 1MA Simplification (2)	M L1
1.1.2	Tablets per day: 25×2 ✓MA = 50 Tablets per week: 50×7 ✓MA = 350 mg ✓A	1MA multiplying by 2 1MA multiplying by 7 1A answer (3)	M L1
1.1.3	Number of days to use tablets: 60 tablets ÷ 2 = 30 days ✓M Last day: 30 March 2021 ✓M Therefore, from the 31st March 2021 a refill is needed. ✓O	1M finding the number of days 1M Referring to last date 1O Conclusion (3)	M L1
1.1.4	25 mg × 120 ✓RT = 3 000 mg ÷ 1 000 ✓C = 3 g ✓A	1RT multiply correct values 1C divide by 1 000 1A answer (3)	M L1
1.2.1	The "North Elevation" shows the side view of the building from the northern direction. ✓✓A	2A correct explanation. (2)	MP L1
1.2.2	(a) A floor plan shows a top view of the inside of a building. ✓✓A	2A correct explanation (2)	MP L1
	(b) An elevation plan shows the side view of the outside of the building. ✓✓A	2A correct explanation (2)	MP L1
1.2.3	Scale = 1 : 100 Measured length: 5 cm Actual length: 5×100 cm ✓M = 500 cm ✓MA	1M multiply by scale 1MA answer (2)	MP L1
1.3.1	90 km × 1000 × 100 × 10 ✓C = 90 000 000 mm ✓A **OR** ✓C 90 km × 1 000 000 = 90 000 000 mm ✓A	1C multiply by 1000 000 1A correct answer (2)	M L1
1.3.2	No of tiles per box $= \dfrac{1,44\ m^2}{0,36\ m^2}$ ✓M = 4 tiles per box ✓A	1M dividing by 0,36 m^2 1A number of tiles (2)	M L1
1.3.3	1,125 hours 1 hour 0,125 hr. × 60 = 7,5 min ✓C 0,5 min × 60 = 30 seconds ✓C 1,125 hours = 1 hr. 7 min 30 seconds ✓A	1C finding minutes 1C finding seconds 1A correct answer (3)	M L1
		[26]	

QUESTION 2 [28 MARKS]			
Quest	**Solution**	**Explanation**	**Level**
2.1.1	George; Knysna; Mossel Bay ✓✓RT **(Any two of the three)**	2RT names of towns (2)	MP L1
2.1.2	South East ✓ ✓A (accept East) North East ✓✓A	2A Direction 2A Direction (4)	MP L1
2.1.3	National roads connect major cities. ✓✓O Save on fuel consumption. ✓✓O Fewer traffic lights ✓✓O Travel faster ✓✓O **[Any two or any acceptable explanation.]**	2O Reason 1 2O Reason 2 (4)	MP L4
2.1.4	2,3 cm = 300 km ✓A Measured distance = 7 cm ✓A Actual distance $= \frac{7\ cm}{2,3\ cm} \times 300$ km ✓M $\approx$ 913 km ✓CA	1A measured bar scale 1A measured distance **range for bar 2.2cm to 2,4cm measured map range distance from 6,9 to 7,1** 1M concept for ratio 1CA rounded answer (4)	MP L2

2.1.5	Distance = Speed × Time
	  913 = 100 × Time✓SF
	
	$= \frac{913\ km}{100\ km/h}$ ✓M
	
	= 9,13 hrs. ✓CA
	
	= 0,13 × 60
	= 7,8 minutes ≈ 8 minutes ✓C
	
	Time of arrival = 9hrs 08 min +1hr +08:00 ✓M
	                = 18:08 ✓CA
	They will arrive later than the planned time. ✓J
		Accept CA from Q 2.1.4
		1SF substitute correct values
		1M changing the subject of the formula
		1CA time in hours
		1 C hours to minutes
		1M adding time
		1CA arrival time
		1J justification
		
		(7)
			MP
			L4

Quest	Solution	Explanation	Level
2.2.1	7,6 litres = 100 km Petrol Consumption $= \frac{913\,km}{100\,km} \times 7,6\ litres$ ✓M $= 9,13 \times 7,6\ litres$ $= 69,388$ litres ✓S Return trip Consumption $= 69,388 \times 2$ ✓M $= 138,776$ litres ✓CA	**Accept CA from Q 2.1.4** 1M concept of ratio 1S simplification 1M multiply by 2 1CA Answer (4)	MP L2
2.2.2	1 642 cents ÷ 100 = R16,42 ✓M Petrol cost = R16,42 × 138,776 litres ✓CA = R 2 278,701 = R 2 278,70 ✓CA	**Accept CA from Q 2.2.1** 1M Conversion 1CA multiply by 138,78 litres 1CA Answer (3)	MP L2
		[28]	

Quest	Solution	Explanation	Level
QUESTION 3 [34 MARKS]			

3.1.1	Radius: 18 cm ÷ 2 = 9 cm ✓M
	Conversion to mm = 9 cm × 10 = 90 mm ✓C
	Area = πr^2
	       = 3,142 × 90 mm × 90 mm ✓SF
	       = 25 450,2 ✓S
	       = 25 450 mm^2 ✓R
		1M radius
		1C conversion
		1SF correct substitution
		1S simplification
		1R rounding
		                (5)
			M
			L3

3.1.2	Radius: 250 mm ÷ 2 = 125 mm ✓MA
	Circumference = 2 × π × r
	               = 2 × 3,142 × 125 mm ✓SF
	               = 785,5 + 50 mm ✓M
	               = 835,5 mm ✓CA
	              OR
	Radius: 250 mm ÷ 2 = 125 mm ✓MA
	Circumference = π × D
	               = 3,142 × 250 ✓SF
	               = 785,5 + 50 ✓M
	               = 835,5 mm ✓CA
		1MA finding radius
		
		1SF correct values
		1M adding 50 mm
		1CA answer
		OR
		1MA finding radius
		
		1SF correct values
		1M adding 50 mm
		1CA answer
		                (4)
			M
			L2

3.1.3	Conversion: length = 400 mm ÷ 10 = 40 cm ✓C
	Volume = l × b × h
	42 000 cm^3 = 40 cm × 30 cm × h ✓SF
	Height = 42 000 cm^3 ÷ 1200 cm^2 ✓S
	               = 35 cm ✓CA
		1C conversion
		1SF in formula
		1S changing the subject of the formula
		1CA answer
		                (4)
			M
			L3

3.1.4	25,4 mm = 1 inches
	Diameter in mm = 250 mm ✓RT
	Diameter in inches = 250 ÷ 25,4
	                    = 9,84 inches ✓MA
	Statement is not valid ✓O
		1RT using correct values 250 mm and 25,4
		1MA convert to inches
		1 O
		                (3)
			M
			L4

3.1.5	Radius value = 250 mm ÷ 2
	                 = 125 mm ✓MA
	Height = 0,64 × 125 mm ✓M
	               = 80 mm ✓CA
		1MA finding the radius
		1M percentage calculation
		1A answer
		                (3)
			M
			L2

3.1.6	Flour : Sugar (3 cups)
	7 cups : 3 cups (× 2)
	14 cups : 6 cups
	
	       $= \dfrac{6}{3}$ ✓MA
	       = 2
	       = 2 × 7 ✓MA = 14 cups of flour ✓A
	               OR
	
	$\dfrac{7}{3}$ ✓MA × 6 ✓MA = 14 cups of flour ✓A
		
		1MA dividing by 3
		
		1MA multiplying by 7
		1A answer
		
		1MA dividing by 3
		1MA multiplying by 6
		1A answer
		                (3)
			M
			L2

Quest	Solution	Explanation	Level
3.1.7	$°C = (°F – 32°) ÷ 1,8$ ✓ SF $= (365 \ °F – 32°) ÷ 1,8$ $= 333 \ °F ÷ 1,8$ ✓ S $= 185°C$ $≈ 190 \ °C$ ✓ R	1SF correct value 1S simplify 1R rounding to 10 degrees (3)	M L2
3.2.1	Tree diagram ✓✓A	2A correct answer (2)	P L1
3.2.2	Missing value P: Boy ✓RT Missing value Z: GBB ✓RT	1RT correct answer 1RT correct answer (2)	P L1
3.2.3	(a) Probability (2 girls at least) $= \frac{4}{8}$ ✓RT✓RT $= \frac{1}{2}$ ✓CA	1RT Numerator 1RT Denominator 1CA simplification (3)	P L2
3.2.3	(b) Probability (BGB) = 0 % ✓✓A	2A correct percentage (2)	P L2
		[34]	

	QUESTION 4 [32 MARKS]		

Quest	Solution	Explanation	Level
4.1.1	Basin / Wash basin ✓✓RT	2RT correct feature (2)	MP L1
4.1.2	1 Window ✓✓RT	2RT correct number (2)	MP L1
4.1.3	Width (bedroom 1 and bedroom 2) = 4 680 + 5 130 ✓MA = 9 810 ✓A Length of bathroom = 13 680 – 9810 ✓ M = 3870 ✓CA Wall (minus door opening) = (3 870 – 860) mm ✓ M = 3 010 mm ✓ CA	1MA adding correct values 1A length 1M finding length of bathroom 1CA answer 1M subtracting door width 1CA answer (6)	M L2

4.2.1	Bathroom Area = Length × Width 　　　　　　= 3 870 mm × 2 250 mm ✓SF 　　　　　　　　✓A 　　　　　　= 8 707 500 mm^2 ÷ 1 000 000 ✓C 　　　　　　= 8,7075 m^2 ✓ CA Kitchen Area = Length × Width ✓SF 　　　　　　= 6 030 mm × 5 130 mm ✓A 　　　　　　= 30 933 900 mm^2 ÷ 1 000 000 ✓ C 　　　　　　= 30,9339 m^2 ✓CA Total Area 　= 8,7075 + 30,9339 　　　　　　= 39,6414 m^2 ✓CA	1SF correct values 1A finding area 1C ÷ by 1 000 000 1CA for the area 1SF correct values 1A finding area 1C ÷ by 1 000 000 1CA for the kitchen area 1CA total area 　　　　　　　(9) **NPR**	M L3
4.2.2	Area of 1 tile: 500 mm × 500 mm 　　　　　= 250 000 mm^2 ✓MA (÷1000 000) ✓C 　　　　　= 0,25 m^2 ✓A No. of tiles needed = 39,6414 m^2 ÷ 0,25 m^2 ✓MCA 　　　　　=158,5656 × 1,05✓M 　　　　　=166,49388 tiles 　　　　　= 167 tiles ✓CA Statement not valid. ✓O	**CA from 4.2.1** 1M area of tile 1C divide by 1 000 000 1MCA ÷ total area by 0,25 m^2 1M increasing by 5% 1CA rounded no. of tiles 1O conclusion 　　　　　　　(7)	M L4
4.2.3	No of boxes = 167 ÷ 4 ✓MCA 　　　　　= 41,75 　　　　　= 42 boxes✓CA Amount for tiles 　= 42 × 249,90 ✓M 　　　　　= R10 495,80 ✓CA Total amount 　　= 10 495,80 + 8 186,09 　　　　　= R18 681,89 ✓M Claim is valid. ✓O	**CA tiles from 4.2.2** 1MCA dividing tiles by 4 1 number of boxes 1M multiply by cost 1CA cost of tiles 1M adding labour cost 1O conclusion 　　　　　　　(6)	M L4
		[32]	

QUESTION 5 [30 MARKS]

Quest	Solution	Explanation	Level
5.1.1	Convert: $175 \div 100 = 1{,}75$ m ✓C $$BMI = \frac{\text{Mass in kg}}{\text{Height} \times m^2}$$ $$25{,}1 = \frac{\text{Mass in kg}}{1{,}75m \times 1{,}75m} \quad ✓SF$$ Mass $= BMI \times (\text{height})^2$ $= 25{,}1 \times (1{,}75)^2$ ✓S Mass in (kg) $= 76{,}86875$ kg $= 76{,}87$ kg ✓CA	1C conversion 1SF correct values 1S changing subject of formula 1CA answer (4)	M L3
5.1.2	Overweight ✓✓ J	1J conclusion (2)	M L1
5.1.3	The young promising rugby player can eat healthier. ✓✓O **OR** He should exercise more regularly ✓✓O	2O Explanation (2)	M L4
5.2.1	3 laps $= 5\,000$ m $\div 1000$ ✓C 1 lap $= 5$ km $\div 3$ ✓MA $= 1{,}67$ km ✓CA **OR** 1 lap $= 5000$ m $\div 3$ ✓MA $= 1\,666{,}666667 \div 1\,000$ ✓C $\approx 1{,}67$ km ✓CA	1C divide by 1 000 1MA divide by 3 1CA distance per lap 1MA divide by 3 1C divide by 1000 1CA distance per lap (3)	MP L2

5.2.2	Incomplete runs: $= 4$ laps $\times 1{,}67$ km ✓M
	$= 6{,}68$ km ✓A
	
	Complete runs $= 3 \times 5$ km
	$= 15$ km $+ 6{,}68$ km ✓MA
	$= 21{,}68$ km ✓CA
	His statement is not valid. ✓O
	OR
	  ✓M ✓M
	$(4 \times 1{,}67) + (9 \times 1{,}67)$
	  ✓A ✓A
	$= 6{,}68 + 15{,}03$
	$= 21{,}71$ km ✓CA
	His statement is not valid. ✓O
		1M multiply by lap distance
		1A correct distance
		1MA finding complete run distance
		1CA finding total distance
		1O correct conclusion
		1M multiply 4 by lap distance
		1M multiply 9 by lap distance
		1A correct distance
		1A correct distance
		1CA finding total distance
		1O correct conclusion
		
		(5)
			MP
			L4

5.2.3	Difference in Time $= 19$ min 30 sec $- 15$ min 45 sec ✓M $= 3$ min 45 sec ✓A Difference in Time per lap $= 3$ min 45 sec $\div 3$ ✓M $= 1$ min 15 sec ✓A Statement is valid ✓	1M subtract time 1A difference in time 1M divide by 3 1A total time 1O reason (5)	MP L3

5.3.1	Number of candles Length : 24 cm ÷ 8 cm = 3 ✓MA Width : 16 cm ÷ 8 cm = 2 ✓MA Height : 24 cm ÷ (1 +11 cm) = 2 ✓M ✓S Total number of candles: 3 × 2 × 2 = 12 candles ✓CA **OR** Length: 8 cm × 3 = 24 therefore 3 will fit ✓MA Width: 8 cm × 2 = 16 therefore 2 will fit ✓MA Height: (11 cm + 1 cm + 11 cm) = 23 cm, therefore 2 will fit ✓MA ✓S Total number of candles: 3 × 2 × 2 = 12 candles ✓CA	1MA ÷ by correct values 1MA for 2 correct values 3 and 2 1M adding 1cm 1S simplify no of candles 1CA conclusion **OR** 1MA × by correct values 1MA for 2 correct values 3 and 2 1M adding 1cm 1S simplify no of candles 1CA conclusion (5)	MP L3
5.3.2	Total area = 2 (H × L) + 2 (W × H) ✓C = 2 (0,24 m × 0,24 m) + 2 (0,16 m × 0,24 m) ✓SF = 0,1152 m² + 0,0768 m² ✓S = 0,192 m² ✓CA	1C converting to m 1SF correct values 1S simplification 1CA answer (4)	M L2
		[30]	
		TOTAL: 150	