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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: $60 \text{ tablets} \div 2 = 30 \text{ days}$ ✓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	$25 \text{ mg} \times 120$ ✓RT = 3 000 mg \div 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: $5 \times 100 \text{ cm}$ ✓M = 500 cm ✓MA	1M multiply by scale 1MA answer (2)	MP L1
1.3.1	$90 \text{ km} \times 1000 \times 100 \times 10$ ✓C = 90 000 000 mm ✓A OR ✓C $90 \text{ km} \times 1\,000\,000 = 90\,000\,000 \text{ mm}$ ✓A	1C multiply by 1000 000 1A correct answer (2)	M L1
1.3.2	No of tiles per box = $\frac{1,44 \text{ m}^2}{0,36 \text{ m}^2}$ ✓M = 4 tiles per box ✓A	1M dividing by $0,36 \text{ m}^2$ 1A number of tiles (2)	M L1
1.3.3	1,125 hours 1 hour $0,125 \text{ hr.} \times 60 = 7,5 \text{ min}$ ✓C $0,5 \text{ min} \times 60 = 30 \text{ seconds}$ ✓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 = $\frac{7 \text{ cm}}{2,3 \text{ cm}} \times 300 \text{ km}$ ✓M $\approx 913 \text{ km}$ ✓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 \times Time 913 = 100 \times Time ✓SF $= \frac{913 \text{ km}}{100 \text{ km/h}}$ ✓M = 9,13 hrs. ✓CA = 0,13 \times 60 = 7,8 minutes \approx 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	<p>7,6 litres = 100 km</p> <p>Petrol Consumption = $\frac{913km}{100 km} \times 7,6 \text{ litres}$ ✓M</p> <p style="padding-left: 40px;">$= 9,13 \times 7,6 \text{ litres}$</p> <p style="padding-left: 40px;">$= 69,388 \text{ litres}$ ✓S</p> <p>Return trip Consumption = $69,388 \times 2$ ✓M</p> <p style="padding-left: 40px;">$= 138,776 \text{ litres}$ ✓CA</p>	<p>Accept CA from Q 2.1.4</p> <p>1M concept of ratio</p> <p>1S simplification</p> <p>1M multiply by 2</p> <p>1CA Answer</p> <p style="text-align: right;">(4)</p>	MP L2
2.2.2	<p>1 642 cents \div 100 = R16,42 ✓M</p> <p>Petrol cost = R16,42 \times 138,776 litres ✓CA</p> <p style="padding-left: 40px;">$= R 2 278,701$</p> <p style="padding-left: 40px;">$= R 2 278,70$ ✓CA</p>	<p>Accept CA from Q 2.2.1</p> <p>1M Conversion</p> <p>1CA multiply by 138,78 litres</p> <p>1CA Answer</p> <p style="text-align: right;">(3)</p>	MP L2
		[28]	

QUESTION 3 [34 MARKS]			
Quest	Solution	Explanation	Level
3.1.1	Radius: $18 \text{ cm} \div 2 = 9 \text{ cm}$ ✓M Conversion to mm = $9 \text{ cm} \times 10 = 90 \text{ mm}$ ✓C Area = πr^2 $= 3,142 \times 90 \text{ mm} \times 90 \text{ mm}$ ✓SF $= 25\,450,2$ ✓S $= 25\,450 \text{ mm}^2$ ✓R	1M radius 1C conversion 1SF correct substitution 1S simplification 1R rounding (5)	M L3
3.1.2	Radius: $250 \text{ mm} \div 2 = 125 \text{ mm}$ ✓MA Circumference = $2 \times \pi \times r$ $= 2 \times 3,142 \times 125 \text{ mm}$ ✓SF $= 785,5 + 50 \text{ mm}$ ✓M $= 835,5 \text{ mm}$ ✓CA OR Radius: $250 \text{ mm} \div 2 = 125 \text{ mm}$ ✓MA Circumference = $\pi \times D$ $= 3,142 \times 250$ ✓SF $= 785,5 + 50$ ✓M $= 835,5 \text{ mm}$ ✓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 = $400 \text{ mm} \div 10 = 40 \text{ cm}$ ✓C Volume = $l \times b \times h$ $42\,000 \text{ cm}^3 = 40 \text{ cm} \times 30 \text{ cm} \times h$ ✓SF Height = $42\,000 \text{ cm}^3 \div 1200 \text{ cm}^2$ ✓S $= 35 \text{ cm}$ ✓CA	1C conversion 1SF in formula 1S changing the subject of the formula 1CA answer (4)	M L3
3.1.4	$25,4 \text{ mm} = 1 \text{ inches}$ Diameter in mm = 250 mm ✓RT Diameter in inches = $250 \div 25,4$ $= 9,84 \text{ inches}$ ✓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 = $250 \text{ mm} \div 2$ $= 125 \text{ mm}$ ✓MA Height = $0,64 \times 125 \text{ mm}$ ✓M $= 80 \text{ mm}$ ✓CA	1MA finding the radius 1M percentage calculation 1A answer (3)	M L2
3.1.6	Flour : Sugar (3 cups) 7 cups : 3 cups ($\times 2$) 14 cups : 6 cups $= \frac{6}{3}$ ✓MA $= 2$ $= 2 \times 7$ ✓MA = 14 cups of flour ✓A OR $\frac{7}{3}$ ✓MA $\times 6$ ✓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	$^{\circ}\text{C} = (^{\circ}\text{F} - 32^{\circ}) \div 1,8$ \checkmark SF $= (365^{\circ}\text{F} - 32^{\circ}) \div 1,8$ $= 333^{\circ}\text{F} \div 1,8 \checkmark$ S $= 185^{\circ}\text{C}$ $\approx 190^{\circ}\text{C} \checkmark$ R	1SF correct value 1S simplify 1R rounding to 10 degrees (3)	M L2
3.2.1	Tree diagram $\checkmark\checkmark$ A	2A correct answer (2)	P L1
3.2.2	Missing value P: Boy \checkmark RT Missing value Z: GBB \checkmark RT	1RT correct answer 1RT correct answer (2)	P L1
3.2.3	(a) Probability (2 girls at least) $= \frac{4}{8} \checkmark$ RT \checkmark RT $= \frac{1}{2} \checkmark$ CA	1RT Numerator 1RT Denominator 1CA simplification (3)	P L2
3.2.3	(b) Probability (BGB) = 0 % $\checkmark\checkmark$ A	2A correct percentage (2)	P L2
		[34]	

QUESTION 4 [32 MARKS]

Quest	Solution	Explanation	Level
4.1.1	Basin / Wash basin $\checkmark\checkmark$ RT	2RT correct feature (2)	MP L1
4.1.2	1 Window $\checkmark\checkmark$ RT	2RT correct number (2)	MP L1
4.1.3	Width (bedroom 1 and bedroom 2) = 4 680 + 5 130 \checkmark MA $= 9 810 \checkmark$ A Length of bathroom = 13 680 – 9810 \checkmark M $= 3870 \checkmark$ CA Wall (minus door opening) = (3 870 – 860) mm \checkmark M $= 3 010 \text{ mm} \checkmark$ 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	<p>Bathroom Area = Length \times Width $= 3\,870\text{ mm} \times 2\,250\text{ mm} \checkmark\text{SF}$ $\checkmark\text{A}$ $= 8\,707\,500\text{ mm}^2 \div 1\,000\,000 \checkmark\text{C}$ $= 8,7075\text{ m}^2 \checkmark\text{CA}$</p> <p>Kitchen Area = Length \times Width $\checkmark\text{SF}$ $= 6\,030\text{ mm} \times 5\,130\text{ mm} \checkmark\text{A}$ $= 30\,933\,900\text{ mm}^2 \div 1\,000\,000 \checkmark\text{C}$ $= 30,9339\text{ m}^2 \checkmark\text{CA}$</p> <p>Total Area = $8,7075 + 30,9339$ $= 39,6414\text{ m}^2 \checkmark\text{CA}$</p>	<p>1SF correct values 1A finding area 1C \div by 1 000 000 1CA for the area</p> <p>1SF correct values 1A finding area 1C \div by 1 000 000 1CA for the kitchen area 1CA total area</p> <p>(9) NPR</p>	M L3
4.2.2	<p>Area of 1 tile: $500\text{ mm} \times 500\text{ mm}$ $= 250\,000\text{ mm}^2 \checkmark\text{MA} (\div 1000\,000) \checkmark\text{C}$ $= 0,25\text{ m}^2 \checkmark\text{A}$</p> <p>No. of tiles needed = $39,6414\text{ m}^2 \div 0,25\text{ m}^2 \checkmark\text{MCA}$ $= 158,5656 \times 1,05 \checkmark\text{M}$ $= 166,49388\text{ tiles}$ $= 167\text{ tiles} \checkmark\text{CA}$</p> <p>Statement not valid. $\checkmark\text{O}$</p>	<p>CA from 4.2.1 1M area of tile 1C divide by 1 000 000 1MCA \div total area by $0,25\text{ m}^2$ 1M increasing by 5% 1CA rounded no. of tiles 1O conclusion</p> <p>(7)</p>	M L4
4.2.3	<p>No of boxes = $167 \div 4 \checkmark\text{MCA}$ $= 41,75$ $= 42\text{ boxes} \checkmark\text{CA}$</p> <p>Amount for tiles = $42 \times 249,90 \checkmark\text{M}$ $= \text{R}10\,495,80 \checkmark\text{CA}$</p> <p>Total amount = $10\,495,80 + 8\,186,09$ $= \text{R}18\,681,89 \checkmark\text{M}$</p> <p>Claim is valid. $\checkmark\text{O}$</p>	<p>CA tiles from 4.2.2 1MCA dividing tiles by 4 1 number of boxes 1M multiply by cost 1CA cost of tiles</p> <p>1M adding labour cost</p> <p>1O conclusion</p> <p>(6)</p>	M L4
[32]			

QUESTION 5 [30 MARKS]			
Quest	Solution	Explanation	Level
5.1.1	Convert: $175 \div 100 = 1,75 \text{ m}$ ✓C $\text{BMI} = \frac{\text{Mass in kg}}{\text{Height} \times \text{m}^2}$ $25,1 = \frac{\text{Mass in kg}}{1,75\text{m} \times 1,75\text{m}}$ ✓SF Mass = BMI \times (height) ² $= 25,1 \times (1,75)^2$ ✓S Mass in (kg) = 76,86875 kg $= 76,87 \text{ kg}$ ✓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 $= 1,67 \text{ km}$ ✓CA OR 1 lap = 5000 m \div 3 ✓MA $= 1\,666,666667 \div 1\,000$ ✓C $\approx 1,67 \text{ km}$ ✓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 $= 6,68 \text{ km}$ ✓A Complete runs = 3 \times 5 km $= 15 \text{ km} + 6,68 \text{ km}$ ✓MA $= 21,68 \text{ km}$ ✓CA His statement is not valid. ✓O OR $(4 \times 1,67) + (9 \times 1,67)$ $= 6,68 + 15,03$ $= 21,71 \text{ km}$ ✓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 $= 3 \text{ min } 45 \text{ sec}$ ✓A Difference in Time per lap = 3 min 45 sec \div 3 ✓M $= 1 \text{ min } 15 \text{ sec}$ ✓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	<p>Number of candles</p> <p>Length : $24 \text{ cm} \div 8 \text{ cm} = 3$ ✓MA Width : $16 \text{ cm} \div 8 \text{ cm} = 2$ ✓MA Height : $24 \text{ cm} \div (1 + 11 \text{ cm}) = 2$ ✓M ✓S</p> <p>Total number of candles: $3 \times 2 \times 2 = 12$ candles ✓CA</p> <p style="text-align: center;">OR</p> <p>Length: $8 \text{ cm} \times 3 = 24$ therefore 3 will fit ✓MA Width: $8 \text{ cm} \times 2 = 16$ therefore 2 will fit ✓MA Height: $(11 \text{ cm} + 1 \text{ cm} + 11 \text{ cm}) = 23 \text{ cm}$, therefore 2 will fit ✓MA</p> <p style="text-align: center;">✓S</p> <p>Total number of candles: $3 \times 2 \times 2 = 12$ candles ✓CA</p>	<p>1MA \div by correct values 1MA for 2 correct values 3 and 2 1M adding 1cm 1S simplify no of candles 1CA conclusion</p> <p style="text-align: center;">OR</p> <p>1MA \times by correct values 1MA for 2 correct values 3 and 2 1M adding 1cm 1S simplify no of candles 1CA conclusion</p> <p style="text-align: right;">(5)</p>	MP L3
5.3.2	<p>Total area = $2 (H \times L) + 2 (W \times H)$ ✓C = $2 (0,24 \text{ m} \times 0,24 \text{ m}) + 2 (0,16 \text{ m} \times 0,24 \text{ m})$ ✓SF = $0,1152 \text{ m}^2 + 0,0768 \text{ m}^2$ ✓S = $0,192 \text{ m}^2$ ✓CA</p>	<p>1C converting to m 1SF correct values 1S simplification 1CA answer</p> <p style="text-align: right;">(4)</p>	M L2
		[30]	
		TOTAL: 150	