education
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE/ NASIONALE SENIOR SERTIFIKAAT

GRADE/GRAAD 12

MATHEMATICAL LITERACY P2/ WISKUNDIGE GELETTERDHEID V2 SEPTEMBER 2023 MARKING GUIDELINES/NASIENRIGLYNE

MARKS: 150

Symbol/*Simbool*	**E×planation/*Verduideliking***
M	Method/*Metode*
MA	Method with accuracy/*Metode met akkuraatheid*
CA	Consistent accuracy/*Volgehoue akkuraatheid*
A	Accuracy/*Akkuraatheid*
C	Conversion/*Herleiding*
S	Simplification/*Vereenvoudiging*
RT	Reading from a table/graph/document/diagram / *Lees vanaf tabel/grafiek/dokument/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in formule*
O	Opinion/E×planation/*Mening/Verduideliking*
P	Penalty, e.g. for no units, incorrect rounding off, etc. / *Straf, bv. Geen eenhede/verkeerde afronding, ens.*
R	Rounding off/*Afronding*
NPR	No penalty for rounding/units/*Geen straf vir afronding/eenhede*
AO	Answer only/*Slegs antwoord*
MCA	Method with consistent accuracy/*Metode met volgehoue akkuraatheid*

These marking guidelines consists of 12 pages and a 2 - page analysis grid. / *Hierdie nasienriglyne bestaan uit 12 bladsye en 'n 2-bladsy ontledingsrooster.*

Copyright reserved/*Kopiereg voorbehou*

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 item presented.
- The general principle of marking is that if a candidate makes one mistake and there is sound mathematics thereafter, the candidate loses one mark.

Stanmorephysics.com

LET WEL:

- As *'n kandidaat 'n vraag TWEE KEER beantwoord, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord van 'n vraag doodtrek (kanselleer) en nie oordoen nie, sien die doodgetrekte (gekanselleerde) poging na.*
- *Volgehoue akkuraatheid (CA) word in ALLE aspekte van die nasienriglyne toegepas, dit hou egter by die tweede berekeningsfout op.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart geneem het en ekstra antwoorde gee, straf vir elke ekstra item.*
- *Die algemene beginsel van merk is dat as 'n leerder een fout maak en dis daarna wiskundig korrek, verloor die leerder een punt.*

QUESTION 1/ *VRAAG 1* [31 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
1.1.1	✓MA ✓A 300 × 1000 = 300 000	1MA multiply by 1 000 1A correct answer (2)	M L1
1.1.2	300 : 375 ✓MA 4 : 5 ✓A	1MA correct ratio order 1A simplification (2)	M L1
1.1.3 (a)	24 hr format ✓✓A *24 uur formaat*	2A correct format. (2)	M L1
(b)	Wednesday/*Woensdag* ✓A ✓MA ✓A 21:58:13 + 2 hours 15 minutes = 00:13:13	1A day 1MA adding 2 hours 15 minutes 1A correct time (3)	M L1
1.2.1	✓C $\frac{375}{1000}$ = 0,375 m ✓A	1C dividing by 1 000 1A simplification (2)	M L1
1.2.2	✓MA 0,375 m × 2 = 0,75 m ✓A	1MA multiply radius by 2 1A simplification (2)	M L1
1.2.3	18 spokes/*speke* ✓✓A	2A correct number of spokes (2)	M L1
1.3.1	71 km/hr ✓✓RT	2RT correct speed (2)	M L1
1.3.2	Degrees Celsius/*Grade Celsius* ✓✓RT **OR/*OF*** ^{0}C ✓✓RT	2RT correct unit (2)	M L1
1.3.3	77 km ✓✓RT	2RT correct distance (2)	M L1
1.4.1	4 ✓✓A	2A correct number of open bookshelves (2)	Maps L1
1.4.2	3 ✓✓A	2A correct types of chairs (2)	Maps L1

Copyright reserved/*Kopiereg voorbehou*

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
1.4.3	Rectangle / *Reghoek*✓✓A	2A correct shape (2)	Maps L1
1.4.4	34 mm ✓✓A	2A correct measurement **Accept 33 mm – 35 mm** (2)	Maps L1
1.4.5	✓MA 1,8 m + 1,4 m + 2,4 m = 5,6 m ✓S	1MA adding correct values 1S simplification (2)	Maps L1

QUESTION/*VRAAG* 2 [20 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
2.1.1	Map showing roads from one point to another/ *Kaart wat paaie van een punt na 'n ander punt wys.* ✓✓A	2A correct definition (2)	Maps L1
2.1.2	✓✓RT 16 points/*punte*	2RT correct number of points (2)	Maps L2
2.1.3 (a)	✓✓O To supply water , Juice , Energy drinks , etc/*Om water, sap, energiedrankies ens. te verskaf.*	2O opinion (2)	Maps L4
2.1.3 (b)	✓ ✓ O For treatment of minor medical problems and will be used to treat or stabilise runners till arrival of ambulance./ *Vir behandeling van geringe mediese probleme en sal gebruik word om hardlopers te behandel of te stabiliseer tot aankoms van ambulans.*	2O temporary health treatment (2)	MP L4
2.1.3 (c)	✓ ✓ O To manage race finishing time./*Om die tyd wanneer die marathon eindig te bestuur.* **OR/*OF*** To remove an athlete in a race because they will not finish the race in an expected time with that pace./ *Om 'n atleet in 'n wedloop te verwyder omdat hulle nie die wedloop in 'n verwagte tyd met daardie pas sal voltooi nie.*	2O time management (2)	MP L4
2.1.4	✓✓ RT South West/*Suidwes* **OR/*OF*** SW	2RT correct direction (2)	Maps L2
2.1.5	Kalk bay ✓✓ RT	2RT correct town (2)	Maps L2
2.1.6	To prepare for the number of athletes that will attend the event/ *Om voor te berei vir die aantal atlete wat die byeenkoms gaan bywoon..* ✓✓ O Any relevent opinion/ *Enige relevante opinie.*	2O opinion (2)	Maps L4
2.2	✓SF ✓MA ✓CA $\frac{56}{3,51166667 \text{ Hrs}} = 15,9468 \text{ km / hr}$ INCORRECT/*NIE KORREK* ✓O	1SF substitution to formula 1MA change subject of formula 1CA speed 1O Justification (4)	Maps L4

Copyright reserved/*Kopiereg voorbehou*

QUESTION/*VRAAG* 3 [39 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
3.1.1	0,65 m × 100 = 65 cm ✓C $\frac{355\ mm}{10\ mm\ /\ cm} = 35{,}5\ cm$ 65 *cm* × 35,5 cm × 30 cm ✓SF ✓A $\frac{69\ 225}{1000}$ ✓C 69,225 litres/*liter* ✓A	1C both correct conversions 1SF substituting to correct formula 1A volume in cm^3 1C convert to litres 1A correct volume in litres (5)	M L2
3.1.2	$\frac{56}{2}$ = 28 cm ✓MA 3,142 × 28^2 × 32 = 78 826,496 cm^3 ✓SF $\frac{78\ 826{,}496}{1000}$ ✓MA 78,826496 litres ✓CA 78,826496 litres - 69,225 litres ✓M 9,601496 litres ✓CA INCORRECT/*NIE KORREK* ✓O	**Ca from 3.1.1** 1MA calculating radius 1SF substituting to correct formula 1MA dividing by 1000 1CA answer 1M calculating difference 1CA simplification 1O conclusion (7)	M L4
3.1.3(a)	✓SF SA = 2 × 3,142 × 28^2 + 2 × 3,142 × 28 × 32 4 926 , 656 + 5630,464 ✓A 10 557,12 cm^2 – (12,568 × 2) ✓M $\frac{10\ 531{,}984\ \text{square cm}}{10\ 000}$ = 1,0531984 m^2 ✓CA ✓MA	1SF substitute to correct formula 1A surface area in cm^2 1M subtract area of openings 1MA divide by 10 000 1CA answer area in m^2 (5)	M L3
3.1.3(b)	✓MA 1,0531984 m^2 × 2 = 2,1063968 m^2 ✓CA	**Ca from 3.1.3(a)** 1MA multiply by 2 coats 1CA area to be painted (2)	M L1

Copyright reserved/*Kopiereg voorbehou*

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	Level
3.1.3(c)	Amount/*Hoeveelheid* $= \frac{2{,}1063968\ m^2}{4}$ ✓M $= 0{,}5265992$ litres ≈ 1 litre ✓RCA	**Ca from 3.1.3(b)** 1M divide by 4 1RCA paint in litres (2)	M L1
3.1.3(d)	Make it last/*Laat dit langer hou* / Durability/ *Duursaamheid* ✓✓O **OR/*OF*** Avoid rust/*Voorkom roes* ✓✓O **OR/*OF*** Any revelant opinion/*Enige relevante opinie*	2O opinion (2)	M L4
3.1.4(a)	✓MA Radius = 8,92 ÷2 = 4,46 cm ✓A	1MA divide by 2 1A correct radius (2)	M L1
3.1.4(b)	Level/*Vlak* $= \frac{90}{100} \times 1\,000\ cm^3$ ✓MA Paint/*Verf* = 900 cm^3 Height/*Hoogte* $= \frac{900}{3{,}142 \times 4{,}46 \times 4{,}46}$ ✓SF ✓A Height/*Hoogte* = 14,40 cm ✓CA	1MA calculating 90% 1SF correct formula 1A radius 1CA height (4)	M L2
3.1.4(c)	✓MA Empty space/*Leë spasie* = 1 000 cm^3 – 900 cm^3 = 100cm^3 ✓C $\frac{100}{1000}$ = 0,1 litres ✓CA	**Ca 3.1.4(b)** 1MA calculating empty space 1C converting to litres 1CA simplification (3)	M L1
3.2.1	9 combinations/*kombinasies* ✓✓A	2A correct number of combinations (2)	P L2
3.2.2	$\frac{1}{3}$ ✓A ✓A	1A numerator 1A denominator (2)	P L2
3.2.3	✓A $\frac{6}{9} \times 100 = 66{,}67\% \approx 67\%$ ✓MA ✓CA	1A numerator 1MA multiply by 100 1CA percentage (3)	P L2

Copyright reserved/*Kopiereg voorbehou*

QUESTION/*VRAAG* 4 [36 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
4.1.1	✓RT ✓M Distance/*Afstand* = 999 – 52 = 947 km ✓A	1RT both values correct 1M subtracting 1A correct km **AO** (3)	Maps L2
4.1.2	✓RT ✓M ✓CA 52 km + 69 km + 179 km = 300 km	1RT all three roads 1M adding distances 1CA answer (3)	Maps L2
4.1.3	✓RT Time/*Tyd* = $\frac{947}{110}$ ✓SF = 8,609090909 hrs ✓A 8 hours/*ure* 36 min ✓C ✓M 5:30 + 8 hours/*ure* 36 min = 14:06 ✓CA	**CA from 4.1.1** 1RT distance 1SF substitute to correct formula 1A travelling time in hrs 1C convert to hrs and minutes M adding travelling time to departure time 1CA arrival time (6)	Maps L3
4.1.4(a)	861 km - 52 km = 809 km ✓MA Capacity/*Kapasiteit* = $\frac{809 \times 5,1}{100}$ ✓MA ✓M = 41, 259 litres ✓CA ✓O CORRECT full tank is 46 litres/*KORREK vol tenk is 46 liter*	1MA calculating distance 1MA multiplication of correct values 1M divide by 100 1CA amount in litres 1O Justification (5)	M L4
4.1.4(b)	✓M ✓CA 41, 259 litres × R21,60 = R891,19	**Ca from 4.1.4(a)** 1M multiply by R21,60 1CA amount (2)	F L1

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	Level
4.2.1.	8 doors/*deure* ✓✓RT	2RT correct number of doors (2)	Maps L2
4.2.2	Area of Bed rooms/*Oppv van slaapkamers* 3 m × 3 m = 9 m² ✓A 9 m² × 2 = 18 m² ✓MA Area of cupboards/*Oppv van kaste* 0,9 m × 0,6 m = 0,54 m² ✓A 0,54 m² × 2 = 1,08 m² ✓A Total area to be carpeted/*Totale oppv van mat* ✓M = 18 m² – 1,08 m² = 16,92 m² ✓A	1A area of bedrooms 1MA multiply area by 2 1A area of cupboards 1A total area of cupboards 1M subtract area of cupboards from 18m² 1A correct area (6)	M L3
4.2.3	An open plan/*Oopplan* ✓✓A Plan with any two rooms without separating walls./ *'n Plan waar enige twee kamers aanmekaar is sonder mure wat hul skei.* ✓✓O	2A correct type of plan 2O correct definition (4)	Maps L2
4.3.1	Octagonal shapes/*Oktagoon-vorms* $= \frac{500}{25}$ ✓MA = 20 ✓A	1MA divide by 25 1A correct number of paving bricks (2)	Maps L2
4.3.2	$\frac{300}{25}$ = 12 ✓A ✓MCA ✓CA 20 ×12 = 240 paving bricks/*plaveisteene*	**Ca from 4.3.1** 1A correct number of paving bricks 1MCA multiplication 1CA simplification (3)	Maps L2

QUESTION/*VRAAG* 5 [24 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**Level**
5.1.1	✓RT 9,5 × 365 = 3 467,50 kWh ✓A	1RT correct value 1A correct units (2)	M L1
5.1.2	$\frac{207{,}10 \text{ bil kWh}}{3\,467{,}50 \text{ kWh}}$ ✓MA = 59 726 027,4 households ≈ 59 726 027 households/*huishoudings* ✓CA	**Ca from 5.1.1** 1MA divide by 3 467,5 1CA Simplification (2)	M L2
5.2.1	✓MA 1,5 × 2 = 3 litres per hour per household */liter per uur per huishouding* 3 litres × 4 hours = 12 litres/*liter* ✓S	1MA multiply with correct values 1S Simplification (2)	M L2
5.2.2	✓CA 12 liters × 5 days = 60 litres/*liter* $\frac{60 \text{ liters}}{3{,}785}$ ✓MA = 15,85204756 gallons/*gallonne* ✓CA ✓M INVALID/*ONGELDIG* ✓O	**CA from 5.2.1** 1MA multiply by 5 1CA amount in litres 1M divide by 3,785 1CA amount in gallons 1O Justification (5)	M L4
5.2.3	✓MA ✓A £1,6605 × 60 litres = £99,63 ✓MA £99,63 × R21,97 = R2188,87 ✓CA	**Ca from 5.2.2** 1MA multiply correct values 1A amount in pounds 1MA multiply by R21,97 1CA amount in Rands (4)	M/ F L3

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	Level
5.3.1	Area of base/*Oppv van basis* $= 1,5\text{ m} \times 2,5\text{ m}$ ✓SF $= 3,75\text{ m}^2$ ✓S $\frac{2}{100} \times 3,75\text{ m}^2 = 0,075\text{ m}^2$ Area of trailer/*Oppv van sleepwa* $= 3,75\text{ m}^2 + 0,075\text{ m}^2$ ✓MA $= 3,825\text{ m}^2$ ✓CA **OR/*OF*** Area of base/*Oppv van basis* $= 1,5\text{ m} \times 2,5\text{ m}$ ✓SF $= 3,75\text{ m}^2$ ✓S Area of trailer/*Oppv van sleepwa* $= 3,75\text{ m}^2 \times 1,02$ ✓MA $= 3,825\text{ m}^2$ ✓CA **OR/*OF*** Area of base/*Oppv van basis* $= 1,5\text{ m} \times 2,5\text{ m}$ ✓SF $= 3,75\text{ m}^2$ ✓S Area of trailer/*Oppv van sleepwa* $= 3,75\text{ m}^2 \times 102\ \%$ ✓MA $= 3,825\text{ m}^2$ ✓CA **OR*OF*** Area of base/*Oppv van basis* $= 1,5\text{ m} \times 2,5\text{ m}$ ✓SF $= 3,75\text{ m}^2$ ✓S Area of trailer/*Oppv van sleepwa* $= 3,75\text{ m}^2 \times \frac{102}{100}$ ✓MA $= 3,825\text{ m}^2$ ✓CA	1SF substitution to correct formula 1S simplification 1MA calculating 2% and adding to area of base 1CA total area of trailer. 1SF substitution to correct Formula. 1S simplification 1MA multiply by 1,02 1CA area of trailer. 1SF substitution to correct Formula. 1S simplification 1MA multiply by 102% 1CA area of trailer. 1SF substitution to correct formula 1S simplification 1MA multiply by 102% 1CA area of trailer (4)	M L3

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	Level
5.3.2	6 cm : 2,5 m 6 cm : 2,5 m × 100 ✓C 6 cm : 250 cm $\frac{6}{6} : \frac{250}{6}$ ✓MA 1 : 41,66666667 ✓CA 1: 42 ✓R **OR/*OF*** ✓A 6 cm : 2,5 m ✓C 0,06 m : 2,5 m 0,06 m : 2,5 m $\frac{0,06}{0,06} : \frac{2,5}{0,06}$ ✓MA 1 : 41.66666667 ✓CA 1: 42 ✓R	**Accept 5,9 cm – 6,1 cm** 1A measurement 1C conversion 1MA divide by 6 1CA simplification 1R rounded 1A correct measurement 1C conversion 1MA dividing correct values 1CA simplification 1R rounded (5)	Maps L3

Copyright reserved

MDE Mathematical Literacy Paper 2 Question Analysis September 2023													
MOD Wiskundige Geletterdheid Vraestel 2 Vraagontleding September 2023													
Ques	**Measurement**	**Maps, Plans**	**Probability**	**Total**	**L1**	**L2**	**L3**	**L4**	**Total**				
											Easy	**Medium**	**Hard**
1.1.1	2				2				2		2		
1.1.2	2				2				2		2		
1.1.3 a	2				2				2		2		
1.1.3 b	3				3				3			3	
1.2.1	2				2				2		2		
1.2.2	2				2				2		2		
1.2.3	2				2				2		2		
1.3.1	2				2				2		2		
1.3.2	2				2				2		2		
1.3.3	2				2				2		2		
1.4.1		2			2				2		2		
1.4.2		2			2				2		2		
1.4.3		2			2				2		2		
1.4.4		2			2				2		2		
1.4.5		2			2				2		2		
										31			
2.1		2			2				2		2		
2.2.1		2				2			2		2		
2.2.2		2						2	2			2	
2.3		4						4	4			4	
2.4		2				2			2		2		
2.5		2				2			2		2		
2.6		4						4	4			4	
2.7		2						2	2			2	
										20			
3.1.1	5					5			5			5	
3.1.2	7							7	7			7	
3.1.3 a	5						5		5			5	
3.1.3 b	2				2				2		2		
3.1.3 c	2				2				2		2		
3.1.3 d	2							2	2				2
3.1.4 a	2				2				2		2		
3.1.4 b	4					4			4			4	
3.1.4 c	3				3				3		3		
3.2.1			2			2			2		2		
3.2.2			2			2			2		2		
3.2.3			3			3			3		3		
										39			

4.1.1		3				3			3		3		
4.1.2		3				3			3		3		
4.1.3		6					6		6				6
4.1.4 a	5							5	5				5
4.1.4 b		2			2				2		2		
4.2.1		2				2			2		2		
4.2.2	6						6		6			6	
4.2.3		4				4			4				4
4.3.1		2				2			2			2	
4.3.2		3				3			3			3	
										36			
5.1.1	2				2				2			2	
5.1.2	2					2			2			2	
5.2.1	2					2			2			2	
5.2.2	5							5	5			5	
5.2.3	4						4		4			4	
5.3.1	4						4		4				4
5.3.2		5					5		5				5
										24			
Total	**83**	**60**	**7**	**150**	**46**	**43**	**30**	**31**	**150**	**150**	**62**	**62**	**26**
Tot.%	**55**	**40**	**5**	**100**	**31**	**29**	**20**	**21**	**100**		**41,3**	**41,3**	**17,4**
% Target	**55**	**40**	**5**	**100**	**30**	**30**	**20**	**20**	**100**		**40**	**40**	**20**
Target	**83**	**60**	**7**	**150**	**46**	**40**	**32**	**32**	**150**				