NATIONAL SENIOR CERTIFICATE/ NASIONALE SENIOR SERTIFIKAAT

GRADE/GRAAD 12

MATHEMATICAL LITERACY P2/

WISKUNDIGE GELETTERDHEID V2

SEPTEMBER 2021

MARKING GUIDELINES/NASIENRIGLYNE

MARKS/PUNTE: 150

Symbol/Simbool	Explanation/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/Explanation/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 consist of 14 pages and a 2-page question analysis.

QUESTION/VRAAG 1 [30 MARKS/PUNTE]

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
1.1.1	1 : 100 $\checkmark\checkmark$A	2A correct scale (2)	**Maps L1**
1.1.2	2 seats/sitplekke $\checkmark\checkmark$A	1A correct no. of seats (2)	**Maps L1**
1.2.1	4 screws/skroewe $\checkmark\checkmark$RT	2RT correct answer (2)	**Maps L1**
1.2.2	Drill/Boor $\checkmark$RT **OR/OF** Wrench/Moersleutel $\checkmark$ RT	2RT correct tool (2)	**Maps L1**
1.2.3	$\checkmark\checkmark$RT $\checkmark\checkmark$RT 2 **OR** Step 2	2RT correct diagram (2)	**Maps L1**
1.2.4	Cylinder / Cylindrical /Silinder / Silindries $\checkmark\checkmark$ A	2A correct shape (2)	**M L1**
1.3.1 (a)	It is a straight line from a circle's centre to its circumference. / $\checkmark\checkmark$A Dit is 'n reguit lyn vanaf die middelpunt van die sirkel tot by sy omtrek. **OR/OF** It is a line segment extending from the centre of a circle to its circumference. / $\checkmark\checkmark$A Dit is 'n lynsegment wat vanaf die middelpunt van 'n sirkel na sy omtrek strek. **OR/OF** The length of a line stretching from the centre to the outside of a circle. /$\checkmark\checkmark$A Dit is die lengte van 'n lyn wat vanaf die middel van die sirkel na die buitekant van 'n sirkel strek.	2A correct definition (2)	**M L1**
1.3.1 (b)	$\dfrac{152\,cm}{2}$ $\checkmark$MA $= 76$ cm $\checkmark$A	1MA dividing diameter by 2 1A correct radius (2)	**M L1**
1.3.2	$\checkmark\checkmark$A $\checkmark\checkmark$A B **or/of** πr^2	2A correct formula (2)	**M L1**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
1.3.3	$\checkmark$MA 755 mm + 5 mm = 760 mm$\checkmark$CA	1MA adding 5 mm 1CA height of table in mm (2)	**M** **L1**
1.3.4	760 mm ÷ 1 000$\checkmark$C = 0,76 m$\checkmark$A	1C mm to m 1CA height of table in m (2)	**M** **L1**
1.4.1	It is a plan with a view of a building seen from one side. / $\checkmark\checkmark$A Dit 'n plan met 'n aansig gesien vanaf een kant van 'n gebou. **OR/OF** It is a two dimensional representation of one side of a building. / $\checkmark\checkmark$A Dit is 'n twee dimensonele verteenwoordiging van een kant van 'n gebou. (2)	2A correct definition	**Maps** **L1**
1.4.2	$\checkmark\checkmark$A 3 cm	**Accept 2,9 cm – 3,1 cm** 2A correct measurement (2)	**M** **L1**
1.4.3	$\checkmark\checkmark$A Area/Oppervlakte **OR/OF** Surface area/Buite-oppervlakte$\checkmark\checkmark$A	2A correct term (2)	**M** **L1**
1.4.4	$\checkmark\checkmark$A $\checkmark\checkmark$A 0 **or/of** None/Geen	2A correct no. of windows (2)	**Maps** **L1**
		[30]	

QUESTION/VRAAG 2 [42 MARKS/PUNTE]			
Q/V	**Solution/Oplossing**	**Explanation/Verduideliking**	**T/L/O/V**
2.1.1	East ✓✓A	2A correct direction (2)	**Maps L2**
2.1.2	9 cm x 200 ✓MA 1 800 cm ✓A	1MA multiply by scale 1A distance (2)	**Maps L2**
2.1.3	R14,41/ℓ × 80 ℓ ✓MA = R1 152,80 ✓A	1MA multiply price by 80 1A cost (2)	**Maps L2**
2.1.4	10:47 – 05:57 ✓MA = 4 h 50 min ✓A 4 h 50 min – 35 min ✓MCA = 4 h 15 min ✓CA 15 min = 0,25 h ✓C Distance = Speed × Time 390 km = Speed × 4,25 h ✓SF Speed = $\frac{390 \text{ km}}{4,25 \text{ h}}$ ✓MCA = 91,76470588 ≈ 90 km/h ✓R	1MA subtract departure time from arrival time 1A duration of trip 1MCA subtracting stoppage 1CA driving time 1C conversion min to hours 1SF distance & time 1MCA changing subject of formula R nearest 10 km/h (8)	**Maps L3**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
2.1.5	✓MA 390 km x 2 = 780 km 780 km + 200 km = 980 km ✓MCA 12,6 ℓ : 100 km 980 km $\dfrac{980\,km}{100\,km}$ x 12,6 ✓MCA ✓CA = 123,48 ℓ ✓MCA (80 ℓ + 50 ℓ) – 123,48 ℓ ✓CA = 6,52 ℓ ✓O His statement is VALID./Sy stelling is GELDIG.	1MA km times 2 1MCA total km's 1MCA divide by 100 km and multiply by 12,6 ℓ 1A no. of litres 1MCA subtract from 130 ℓ 1CA litres left in tank 1O conclusion (7)	**Maps L4**
2.2	✓MA ✓MA 2 (R96 + R64 + R39 + R15,50 + R15,50) = 2 (R230) = R460 ✓CA	1MA multiply by 2 1MA adding correct values 1CA total toll fees (3)	**Maps L3**
2.3	✓MCA R20 000 × 0,296905 = R5 938,10 ✓A	1MCA multiply by 29,6905% 1A amount saved (2)	**Maps L2**

2.4.1	✓✓A
	Bar scale/Staafskaal
	
	   OR/OF
	             ✓✓A
	Line scale/Lynskaal
		2A correct scale
		(2)
			**Maps
			L1**

2.4.2	✓✓A 22 mm	**Accept 21 mm – 23 mm** 2A correct measurement (2)	**Maps L2**
2.4.3	✓✓CA 22 mm on the map represents 8 km in real life./ 22 mm op die kaart verteenwoordig 8 km in die werklike lewe.	**CA measurement 2.4.2** 2A explanation (2)	**Maps L1**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
2.4.4	The bar scale will be reduced and enlarged with the map./ ✓✓A Die staafskaal word verklein en vergroot saam met die kaart. (2)	2O reason	**Maps L4**
2.4.5	Gauteng ✓✓A	2A correct province (2)	**Maps L1**
2.4.6	Crocodile river/Krokkodilrivier ✓✓A	2A correct river (2)	**Maps L2**
2.4.7	R511 ✓✓A **OR/OF** R512 ✓✓A (2)	2A correct route number	**Maps L1**
2.4.8	Rustenburg ✓✓A	2A correct town (2)	**Maps L2**
		[42]	

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
QUESTION/VRAAG 3 [42 MARKS/PUNTE]			
3.1.1	917 635 × 50 watts ✓MA = 45 881 750 watts ✓A	1A multiply by 50 1A no. of watts (2)	**M** **L2**
3.1.2	45 881 750 ÷ 1 000 000 ✓C = 45,881750 megawatts ✓A	1C watts to megawatts 1A correct megawatts (2)	**M** **L1**
3.1.3	No of hours/Aantal uur = $\dfrac{27\,807\,\text{km}}{4\,\text{km/h}}$ ✓SF = 6 951,75 h ✓CA No. of days/Aantal dae = $\dfrac{6\,951,75\text{h}}{8\,\text{h/day}}$ ✓MCA = 868,96875 ≈ 869 days/dae ✓CA Johnny was CORRECT./Johnny was KORREK. ✓O **OR/OF** No of hours/Aantal uur = 870 days x 8 h/day ✓MA = 6 960 h ✓CA Speed/Spoed = $\dfrac{27\,807\,\text{km}}{6\,960\,\text{h}}$ ✓SF = 3,995258620689655 km/h ✓CA 3,995258620689655 km/h < 4 km/h Johnny was CORRECT. /Johnny was KORREK. ✓O **OR/OF** No of hours/Aantal uur = 870 days x 8 h/day ✓MA = 6 960 h ✓CA Distance/Afstand = 4 km/h x 6 960 h ✓SF = 27 840 km ✓CA 27 840 km > 27 807 km Johnny was CORRECT./Johnny was KORREK. ✓O	1SF distance and speed 1CA no. of hours 1MCA divide by h/day 1CA no. of days 1O conclusion 1MA multiply 870 days by 8 h 1CA no. of hours 1SF distance and time 1CA speed 1O conclusion 1MA multiply 870 days by 8 h 1CA no. of hours 1SF speed and time 1CA distance 1O conclusion (5)	**M** **L4**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
3.1.4	$4\ 945\ km^2 \times 0,003$ ✓MA $= 14,835\ km^2$ ✓CA	1MA multiply by 0,3% 1CA correct km^2 (2)	**M** **L2**
3.1.5	A ✓✓ A **or/of** length x breadth / lengte x breedte ✓✓ A	1A correct formula (2)	**M** **L1**
3.1.6	Six million four hundred and twenty nine thousand nine hundred and twenty three ✓✓A Ses miljoen vier honderd nege en twintig duisend nege honderd drie en twintig	2A no. residents in words (2)	**M** **L1**
3.2.1	$1931 – 1922$ ✓MA $= 9$ years/jaar ✓A	1MA subtracting 1A no. of years (2)	**M** **L2**
3.2.2 (a)	Perimeter is the total length of all the sides of a shape./ ✓✓A Omtrek is die totale lengte van al die kante van 'n vorm. **OR/OF** Perimeter is the total length around a shape./ Omtrek is die totale lengte rondom 'n vorm. ✓✓A	2A definition perimeter (2)	**M** **L1**
3.2.2 (b)	Perimeter/Omtrek = 8 m x 4 ✓MA $= 32$ m ✓A	1MA multiply by 4 1A perimeter (2)	**M** **L2**
3.2.3	30 m $+ 8$ m ✓MA $= 38$ m ✓A	1A adding 1C height of statue (2)	**M** **L2**
3.2.4	38 m x 3,28084 ft/m ✓C $= 124,67192$ ft ✓CA	**CA metre in 3.2.3** 1C m to feet 1CA no. of feet (2)	**M** **L2**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
3.2.5	635 tons – (80 tons × 2) $\checkmark$MA = 475 tons/ton 475 tons/ton – 30 tons/ton $\checkmark$MCA = 445 tons/ton $\checkmark$CA	1MA subtract weight arms 1MCA subtract weight head 1CA weight (3)	**M** **L3**

3.2.6	30 m – 3,75 m = 26,25 m $\checkmark$A
	
	445 tons/ton x 0,42 m³/ton
	
	= 186,9 m³ $\checkmark$C
	
	Volume = l x w x h
	
	186,9 m³ = 6 m x w x 26,25 m $\checkmark$SF
	
	Width/Wydte = $\dfrac{186,9 \text{m}^3 \quad \checkmark\text{MCA}}{6 \text{m x } 26,25 \text{m}}$
	
	    = 1,186666667
	
	    ≈ 1,2 m $\checkmark$R
		CA weight 3.2.5
		
		1A height without head
		
		1C ton to m³
		
		1SF volume, length and height
		
		1MCA changing subject
		
		1R width
		
		(5)
			M
			L3

3.3.1	Circumference/Omtrek = 3,142 × 122 m $\checkmark$SF = 383,324 m $\checkmark$A	1SF pi and diameter 1A circumference (2)	**M** **L2**

3.3.2	$\dfrac{502,72\text{m} \quad \checkmark\text{MCA}}{383,324\text{m}}$
	
	= 1,31147541 $\checkmark$CA
	
	                  $\checkmark$O
	Annie's statement is INVALID./Annie se stelling is ONGELDIG.
	
	OR/OF
	       $\checkmark$MCA
	383,324 x 2
	
	= 766,648 m $\checkmark$CA
	
	                    $\checkmark$O
	Annie's statement is INVALID./Annie se stelling is ONGELDIG.
		CA circumference 3.3.1
		1MCA divide by inner circumference
		
		1CA times more
		
		1O conclusion
		
		1MCA multiply inner circumference by 2
		1CA twice the inner circumference
		1O conclusion
		
		(3)
			M
			L4

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
3.3.3	15 min $\times$ 2 = 30 min$^{\checkmark A}$ 90 min + 30 min = 120 minutes/minute$^{\checkmark CA}$	1A extra time 1A duration (2)	**M** **L3**
3.3.4	$\dfrac{30\,\text{min}}{120\,\text{min}}$ x 100$^{\checkmark MCA}$ = 25%$^{\checkmark CA}$	**CA extra and full time 3.3.3** 1MCA calculating percentage 1CA percentage (2)	**M** **L2**
		[42]	

QUESTION/VRAAG 4 [36 MARKS/PUNTE]			
Q/V	**Solution/Oplossing**	**Explanation/Verduideliking**	**T/L/O/V**
4.1.1	$\dfrac{460\,kg}{0,453592\,kg/lb}$ ✓MA = 1 014,13 lb ✓A	1MA dividing by 0,453592 1A answer (2)	**M** **L2**
4.1.2	$\dfrac{460\,kg}{100\,kg}$ x 3 ✓MA = 13,8 kg/cow/day 13,8 kg x 150 cows/koeie ✓MCA = 2 070 kg/day/dag 2 070 kg x 365 days/year/dae/jaar ✓MCA = 755 550 kg ✓CA His claim is CORRECT./Sy bewering is KORREK. ✓O **OR/OF** 460 kg x 150 cows/koeie ✓MA = 69 000 kg 69 000 kg x 365 days/year/dae/jaar ✓MCA = 25 185 000 kg $\dfrac{25185000\,kg}{100\,kg}$ x 3 kg ✓MCA = 755 550 kg ✓CA His claim is CORRECT. /Sy bewering is KORREK. ✓O	1MA multiply by 3 and divide by 100 1MCA multiply by 150 1MCA multiply by 365 1CA feed per annum 1O conclusion 1MA multiply by 150 1MCA multiply by 365 1MA multiply by 3 and divide by 100 1A feed per annum 1O conclusion (5)	**M** **L4**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
4.2.1	$(9 + 21)$ $= 30$ ✓A 30×2 ✓MCA $= 60$ ✓CA **OR** (10×3) $= 30$ ✓A ✓MCA 30×2 ✓CA $= 60$	 1A correct no of bales 1MCA multiply by 2 1CA answer 1A correct no of bales 1MCA multiply by 2 1CA answer (3)	**M** **L3**
4.2.2	Radius $= 0,9144 \div 2 = 0,4572$ m ✓A Volume $= 3,142 \times (0,4572$ m$)^2 \times 1,8$ m ✓SF ✓CA $= 1,182200474$ m^3 Total/Totale volume $= 1,182200474304$ m$^3 \times 60$ $= 70, 932$ m^3 ✓CA	**CA no. of bales 4.2.1** 1A radius 1SF radius and height 1CA volume of one bale 1CA total volume (4)	**M** **L3**
4.2.3	Total SA/Totale BO ✓SF $= 2 \times 3,142 \times 0,4572 (0,4572 + 1,8)$ ✓CA $= 6,485036723$ m^2 $\dfrac{1,182200474}{6,485036723} \times 100$ ✓MCA $= 18,228736\%$ ✓CA The bales CONFORM to the specifications./ Die bale VOLDOEN aan die spesifikasies. ✓O	**CA volume one bale 4.2.2** 1SF substituting correct values to correct formula 1CA simplification 1M calculating percentage 1CA percentage **NPR** 1O conclusion (5)	**M** **L4**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V

4.3	✓RT ✓SF
	 $37° = (°F - 32°) \div 1,8$
	
	             ✓MA
	 $°F = (37° \times 1,8) + 32°$
	
	    $= 66,6° + 32°$
	
	    $= 98,6°F$ ✓CA
	
	 The action is INCORRECT./Die aksie is ✓O
	 VERKEERD.
	
	 OR/OF
	
	 No action is required./Dit vereis geen aksie nie. ✓O
		1RT correct temperature
		 1SF °C
		 1MA changing subject of formula
		
		 1CA °F
		
		 1O conclusion
		
		(5)
			M
			 L4

4.4.1	B ✓✓A	2A correct code (2)	**P** **L2**
4.4.2	$\dfrac{2}{4}$ ✓A $= \dfrac{1}{2}$ ✓CA	1A correct common fraction 1A simplified fraction (2)	**P** **L2**
4.4.	$\dfrac{3}{4}$ ✓A ✓CA $= 0,75$	1A correct fraction 1CA correct decimal fraction (2)	**P** **L2**
4.4.4	C ✓✓A **or/of** Less likely/Minder ✓✓A waarskynlik	2A correct description (2)	**P** **L2**

Q/V	Solution/Oplossing	Explanation/Verduideliking	T/L/O/V
4.5	Measured distance/Gemete afstand: 2,2 cm $\checkmark$A Bar scale distance/Staafskaal afstand: 2,8 cm = 150 km $\dfrac{2,2\,cm \times 150}{2,8\,cm}$ $\checkmark$MCA = 117,8571428571 km ≈ 118 km $\checkmark$R **[Accept 2 cm – 2,4 cm for map measurement/ Aanvaar 2 cm – 2,4 cm vir kaart meting]** **[Accept 2,6 cm – 2,8 cm for bar scale measurement/ Aanvaar 2,7 cm – 2,9 cm vir staafskaal meting]** **OR/OF** Measure distance/Gemete afstand: 22 mm $\checkmark$A Bar scale distance/Staafskaal afstand: 28 mm = 150 km $\checkmark$A $\dfrac{22\,mm \times 150}{28\,mm}$ $\checkmark$MCA = 117,8571428571 km ≈ 118 km $\checkmark$R **[Accept 20 mm – 24 mm for map measurement/ Aanvaar 20 mm – 24 mm vir kaart meting]** **[Accept 27 mm to 29 mm for bar scale measurement/ Aanvaar 27 mm – 29 mm vir staafskaal meting]**	1A correct map distance 1A correct scale distance 1MCA working with scale 1R actual distance 1A correct map distance 1A correct scale distance 1MCA working with scale 1R actual distance (4)	**Maps L3**
		[36]	

Mathematical Literacy Paper 2 Question Analysis								
September 2021								
Question	Mea-sure-ment	Maps, Plans	Proba-bility	Total	L1	L2	L3	L4	Total
1.1.1		2			2				
1.1.2		2			2				
1.2.1		2			2				
1.2.2		2			2				
1.2.3		2			2				
	2				2				
1.3.1	2				2				
1.3.2	2				2				
1.3.3	2				2				
1.3.4	2				2				
1.3.5	2				2				
1.4.1		2			2				
1.4.2	2				2				
1.4.3	2				2				
1.4.4		2			2				
	16	**14**		**30**	**30**				**30**
2.1.1		2				2			
2.1.2		2				2			
2.1.3		2				2			
2.1.4		8					8		
2.1.5		7						7	
2.2		3					3		
2.3		2				2			
2.4.1		2			2				
2.4.2		2				2			
2.4.3		2			2				
2.4.4		2						2	
2.4.5		2			2				
2.4.6		2				2			
2.4.7		2			2				
2.4.8		2				2			
		42		**42**	**8**	**14**	**11**	**9**	**42**
3.1.1	2					2			
3.1.2	2				2				
3.1.3	5							5	
3.1.4	2					2			
3.1.5	2				2				
3.1.6	2				2				
3.2.1	2					2			
3.2.2 (a)	2				2				
3.2.2 (b)	2					2			
3.2.3	2					2			
3.2.4	2					2			
3.2.5	3						3		

       Please turn over

Question	Mea-sure-ment	Maps, Plans	Proba-bility	Total	L1	L2	L3	L4	Total
3.2.6	5						5		
3.3.1	2					2			
3.3.2	3							3	
3.3.3	2						2		
3.3.4	2					2			
	42			**42**	**8**	**16**	**10**	**8**	**42**
4.1.1	2					2			
4.1.2	5							5	
4.2.1	3						3		
4.2.2	4						4		
4.2.3	5							5	
4.3	5							5	
4.4.1			2			2			
4.4.2			2			2			
4.4.3			2			2			
4.4.4			2			2			
4.5		4					4		
	24	**4**	**8**	**36**		**10**	**11**	**15**	**36**
Tot. marks	**82**	**60**	**8**		**46**	**40**	**32**	**32**	**150**
Tot. %	**55**	**40**	**5**		**30**	**27,3**	**21,3**	**21,3**	**100**
% req.	**55**	**40**	**5**	**100**	**30**	**30**	**20**	**20**	**100**
Marks req.	**82**	**60**	**8**	**150**	**46**	**44**	**30**	**30**	**150**