education

Department of Education
FREE STATE PROVINCE

PREPARATORY EXAMINATION/
VOORBEREIDENDE EKSAMEN

GRADE 12/*GRAAD 12*

MATHEMATICAL LITERACY P1/
WISKUNDIGE GELETTERDHEID V1

SEPTEMBER 2023

MARKING GUIDELINES/
NASIENRIGLYNE

MARKS/*PUNTE*: 150

Symbol/*Kode*	**Explanation/*Verduideliking***
M	Method/*Metode*
MA	Method with accuracy/*Metode van akkuraatheid*
CA	Consistent accuracy/*Volgehoue akkuraatheid*
A	Accuracy/*Akkuraatheid*
C	Conversion/*Herleiding*
S	Simplification/*Vereenvoudiging*
RT	Reading from a table/graph/diagram/*Lees vanaf tabel/grafiek/diagram*
SF	Correct substitution in a formula/*Korrekte vervanging in'n formule*
O	Opinion/Example/Definition/Explanation/*Opinie/Voorbeeld/Definisie/Verduideliking*
P	Penalty, e.g., for no units, incorrect rounding off, etc./*Penalisasie, bv. vir geen eenhede,verkeerde afronding ens.*
R	Rounding off/*Afronding*
NPR	No penalty for correct rounding/*Geen penalisering vir korek afronding nie*
NPU	No penalty for the units/*Geen penalisering vir eenhede nie*
AO	Answer only, if correct, full marks/*Slegs antwoord, indien korrek, volpunte*
MCA	Method with consistent accuracy/*Metode met volgehoue akkuraatheid*

These marking guidelines consist of 15 pages./
Hierdie nasienriglyne bestaan uit 15 bladsye.

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.
- General principle of marking, if the candidate makes one mistake, he loses one mark.

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 by die tweede berekeningsfout op.*
- *Wanneer 'n kandidaat aflesings vanaf 'n grafiek, tabel, uitlegplan en kaart neem en ekstra antwoorde gee, penaliseer vir elke ekstra item.*
- *Die algemene beginsel van merk as 'n leerder een fout maak verloor hy een punt.*

QUESTION/*VRAAG* 1 [31 MARKS/*PUNTE*]		**ANSWER ONLY = FULL MARKS**	
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
1.1.1	41150801599 ✓✓RT	2RT correct number (2)	F L1 E
1.1.2	6/Six ✓✓RT	2RT correct number (2)	F L1 M
1.1.3	✓✓A Value added tax/*Belastng op toegevoegde waarde.* **VAT only = 1 mark**	2A explanation (2)	F L1 E
*1.1.4	✓MA ✓RT VAT/*BTW* = $\frac{15}{100}$ × R1 305,95 = R195,89	1RT correct value 1MA percentage calculation (2)	F L1 M
1.1.5	✓A ✓A Tariff is the amount charged per kilolitres of water./*Tarief is die bedrag gehef per kiloliter water*	1A amount charged 1A per kilolitre (2)	F L1 D

Q/V	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
*1.1.6	Amount charged/*Bedrag gehef* ✓RT ✓MA = 15 kℓ × R25,2300/kℓ = R378,45 ✓CA	1RT correct values 1MA multiplying values 1CA simplification (3)	F L1 E
1.2.1	✓✓A Numerical/*Numeries*	2A correct classification (2)	D L1 M
1.2.2	42 ✓✓A	2A correct identification (2)	D L1 E
1.2.3	✓RT ✓A 42 ; 103 ; 104 ; 108 ; 110 ; 113 ; 117 ; 118 ; 118 ; 121 ; 124 ; 130	1RT all correct marks 1A ascending order (2)	D L1 E
1.2.4	✓✓RT December/*Desember* ***OR*** *Month 12/ 12th Month/12fde maand*	2RT December (2)	D L1 M
1.2.5	✓✓A Inter-Quartile range/*Interkwartielvariasiewydte*	2A explanation (2)	D L1 E
1.3.1	✓✓A Two-way table/*Tweerigting tabel* **OR** ✓✓A Contigency table.	2A correct answer (2)	P L1 M
1.3.2	**(i)** Yellow/*geel* ✓✓A **(ii)** WR (White Red) ✓✓A	2A correct option 2A correct outcome (4)	P L1 D E
1.3.3	6/Six ✓✓A	2A correct number (2)	P L1 E

QUESTION/*VRAAG* 2 [31 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
2.1.1	✓✓O **An Employee** is a person working/employed at the government departments and receives a salary./*'n Werknemer is 'n persoon wat werk/indiens is van die regeringsdepartemente en 'n salaris ontvang.*	1O working for government 1O earning a salary (2)	F L1 D
2.1.2	Total amount/*Totale bedrag* ✓RT = 19,7 + 92,4 + 2,3 + 6,1 + 183,2 + 61,2 + 100,1 + 14,8 + 2,5 + 8,4 + 3,5 + 6,6 + 10,3 + 1,3 + 0,4 + 0,2 + 2,6 + 5,4 + 1,8✓MA = 522,8 **OR/*OF*** Total amount/*Totale bedrag* ✓RT ✓MA = 1 581,4 – 627,3 – 251,0 – 173,3 – 7,0 = 522,8	1RT all correct amounts 1MA adding amounts 1RT all correct amounts 1MA subtracting amounts (2)	F L1 M
2.1.3	✓✓O Basic education has more employees than other departments./*Basiese Onderwys het meer werknemers as die ander departemente* **OR/*OF*** ✓✓O Employees at basic education earn more than other employees./*Werknemers by Basiese Onderwys verdien meer as ander werknemers.* **OR/*OF*** ✓✓O Employees at basic education have higher educational qualifications than other departments./*Werknemers by Basiese Onderwys het hoër onderrig kwalifikasies as in ander departemente.*	2O correct explanation (2)	F L4 M

Q/V	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
*2.1.4	Percentage expenditure/*Persentasie uitgawes* $= \frac{8,5}{11,2} \times 100\%$ ✓RT ✓MA $= 75,9\%$ ✓CA The department has a surplus ✓O	1RT correct amount 1MA correct percentage calculation 1CA simplification 1O conclusion **NPR** (4)	F L3 M
2.1.5	Police: vans/bakkie/ cars/ combi/hippo (casspirs)/nyala/horse/motorbike/bicycle/hoverboard/ balance scooter/boat/bus/helicopter/trucks ✓✓O *Polisievangwaens, motors, kombi, seekoei, nyala*	2O correct goods (2)	F L4 M
2.1.6	Capital spending/*kapitaal spandeer* 2018/19 = R78,9 billion/*miljard* – R520 000 000 ✓RT = R78 900 000 000 – R520 000 000 ✓C ✓M = R78 380 000 000 ✓CA **OR/*OF*** Capital spending/*kapitaal spandeer* 2018/19 = R78,9 billion/*miljard* – R520 000 000 ✓RT = R78,9 billion/*miljard* – R0,52 billion/*miljard* ✓M ✓C = R78,38 billion/*miljard* ✓CA	1RT correct amount 1C correct conversion 1M subtracting 1CA simplification 1RT correct amount 1C correct conversion 1M subtracting 1CA simplification (4)	F L3 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
2.1.7	Amount of interest/*Rentebedrag* Year/*Jaar* 1 $R50\,000\,000 \times \frac{6,8}{100}$ ✓MA $= R3\,400\,000$ ✓A Total after year/*totaal na jaar* 1 $= R50\,000\,000 + R3\,400\,000$ $= R53\,400\,000$ ✓A 6 months/*maande* $R53\,400\,000 \times \frac{6,8}{100} \times \frac{6}{12}$ ✓MA $= R1\,815\,600$ Final amount/*finale bedrag* $= R53\,400\,000 + R1\,815\,600$ $= R55\,215\,600$ ✓CA **OR/*OF*** Total after year/*Totaal na jaar* 1 $= R50\,000\,000 \times 1,068$ ✓MA ✓MA $= R53\,400\,000$ ✓A Interest rate for 6 months/*Rentekors na 6 maande* $6,8\% \times \frac{6}{12}$ $= 3,4\%$ ✓A Total after year 1 and 6 months/*Totaal na jaar 1 en 6 maande* $= R53\,400\,000 \times 1,068$ $= R55\,215\,600$ ✓CA	1MA calculating 6,8% 1A interest year 1 1A amount end of year 1 1MA calculating 6 months 1CA final amount 1MA calculating 1,068 1MA multiplying by 1,068 1A amount end of year 1 1A calculating 3,4% 1CA final amount (5)	F L3 D

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
2.2.1	$\%\ \text{change} = \frac{\textit{new value} - \text{old value}}{\textit{old value}} \times 100$ ✓A $\%\ \textit{verandering} = \frac{\textit{nuwe waarde} - \text{ou waarde}}{\textit{ou waarde}} \times 100$ $= \frac{\text{R10,00 - R7,50}}{\text{R7,50}} \times 100$ ✓SF $= 33{,}3\%$ ✓CA	1A correct formula 1SF numerator 1SF denominator 1CA simplification (4)	F L3 M
2.2.2	Withdrawal at own bank *Onttrekking by eie bank* $= \frac{\text{R2000}}{\text{R500}} \times \text{R10,00}$ ✓MA ✓M $= 4 \times \text{R10,00}$ $= \text{R40,00}$ ✓CA Withdrawal at point of sale = R1,40 ✓RT Difference = R40,00 – R1,40 = R38,60 ✓CA His statement is valid ✓O **OR** $= \frac{\text{R2000}}{\text{R100}} \times \text{R2,00}$ ✓MA ✓M $= 20 \times \text{R2,00}$ $= \text{R40,00}$ ✓CA Withdrawal at point of sale = R1,40 ✓RT Difference = R40,00 – R1,40 = R38,60 ✓CA His statement is valid ✓O	1MA dividing correct values 1M multiplying by R10,00 1CA simplification 1RT correct amount 1CA difference 1O conclusion 1MA dividing correct values 1M multiplying by R10,00 1CA simplification 1RT correct amount 1CA difference 1O conclusion (6)	F L4 M

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QUESTION/*VRAAG* 3 [24 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
3.1.1	✓✓O Questionnare/*vraelys* **OR** Survey/*opname* ✓✓O	2O correct method (2)	D L1 E
3.1.2	Total value/*totale waarde* ✓RT ✓MA = 2 199 + 394 163 + 40 + 213 + 32 = 3 041	1RT all correct values 1MA adding (2)	D L1 E
3.1.3	Number of home robbery/*aantal huisinbrake* ✓RT = 449 × 1 000 ✓A = 449 000 **OR/*OF*** 449 thousand/*duisend*	1RT reading from the table 1A correct number (2)	D[L1 E
3.1.4	Mean home roberries 2018 - 2022 $= \frac{459+449+415+312+394}{5}$ ✓RT ✓MA $= \frac{2029}{5}$ ✓S = 405,8 thousand/ 405 800 ✓CA	1MA adding correct values 1M concept of mean 1S simplification 1CA correct mean **AO** (4)	D L2 M
3.1.5	✓✓O The number of crimes was less than a thousand/ *Die aantal misdade was minder as duisend* **OR/*OF*** The number could not be rounded to the nearest 1 000/*Die getal kan nie afgerond word tot die naaste 1 000 nie* ✓✓O **OR/*OF*** ✓✓O No data/statistics not recorded / The crime was not reported/Geen data/statistiek nie aangeteken/ *Die misdaad is nie aangemeld nie*	2O correct reason (2)	D L4 D

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
3.2.1	✓A Compound/Multiple/Quadruple/Grouped bar graph✓A ✓A Saamgestel/veelvuldig/viervoudig/gegroepeer/ staafgrafiek✓A	1A type 1A bar graph (2)	D L1 E
3.2.2	✓RT ✓MA Increase in percentage/ = 37,2% – 33,1% *Toename in persentasie* = 4,1%✓CA	1RT reading from graph 1MA subtracting values 1CA simplification **AO** (3)	D L2 E
3.2.3	Number of people in South Africa/*Aantal mense in Suid-Afrika* $=\frac{100}{4,8}$ ✓A × 2,85 million✓MA/*miljoen* = 59,3749999999 million/*miljoen* = 59 400 000✓CA	1A correct percentage 1MA calculating a percentage 1CA simplification (3)	D L2 M
3.2.4	✓A Range = Highest value – Lowest value *Omvang = hoogste waarde – laagste waarde* 7,7% = Highest value – 44,1%✓SF Highest value = 44,1% + 7,7%✓A = 51,8%✓CA	1A correct formula 1SF correct substitution 1A changing the subject of the formula 1CA highest value (4)	D L3 M

QUESTION/*VRAAG* 4 [32 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
4.1.1	IRP5 ✓✓A	2A correct name (2)	F L1 E
4.1.2	✓✓RT Twelve **OR** 12	2RT correct number (2)	F L2 E
*4.1.3	Annual tax/*Jaarlikse belasting* = ✓A R70 532 + 31% of taxable income above/*van belasbare inkomste bo* 337 800 ✓SF = R70 532 + 31% (R466 755,22 – R337 800) = R70 532 + (31% × R128 955,22) ✓CA = R70 532 + R39 976,12 = R110 508,12 ✓CA Tax payable/*Belasting betaalbaar* ✓M = R110 508,12 – R15 714 – R8 640 = R86 154,12 ✓CA	1A correct tax bracket 1SF correct substitution 1CA simplification 1CA tax before rebates 1M subtracting rebate and medical tax credits 1CA annual tax (6)	F L3 D
4.1.4	Medical tax credits/ *Mediese belastingkrediete* = R332 + R332 ✓ RT = R664 × 12 ✓ MA = R7 968 ✓ CA ✓ O His claim is valid/*sy bewering is geldig*	1RT correct tax credit 1MA multiplying by 12 1CA simplification 1O conclusion (4)	F L4 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
4.1.5	2021 salary = $= \frac{100}{107,8} \times R499\,413$ ✓A ✓MA = R463 277,37 ✓CA 2020 salary/*salaris* = R463 277,37 – (R1 000 × 12) ✓M = R451 277,37 ✓CA 2019 salary/*salaris* = R451 277,37	1A correct percentage 1MA calculating a percentage 1CA simplification 1M multiplying by 12 and subtracting 1CA 2019 salary (5)	F L3 D

Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
4.2.1	✓✓O The data can be measured/*Die data kan gemeet word*	2O explanation (2)	D L1 D
4.2.2	September ✓RT November ✓RT	1RT September 1RT November (2)	D L1 M
*4.2.3	✓O As the interest rate increases, the monthly repayments also increase./✓O *Soos die rentekoers styg, neem die maandelikse terugbetalings ook toe*	1O interest rate increase 1O monthly repayments increase (2)	D L4 D
4.2.4	Difference in monthly repayments/*Verskil in maandelikse terugbetalings* ✓MA = R4 749,16 – R4 505,06 = R244,10✓CA ✓O His complaint is not valid/*sy klagte is nie geldig nie*	 1MA subtracting values 1CA simplification 1O conclusion (3)	F L4 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
4.2.5	✓✓O The monthly instalment will be higher./ *Die maandlikse paaiement word hoër* **OR/*OF*** ✓✓O They might not afford the new monthly repayments./ *Hulle kan dalk nie die nuwe maandelikse terugbetalings bekostig nie* **OR/*OF*** ✓✓O They may have to reduce other expenses./ *Hulle sal dalk ander uitgawes moet verminder* **OR/*OF*** ✓✓O Sell their homes/Relocate to a smaller house./ *Verkoop hul huise/Verhuis na 'n kleiner huis* **OR/*OF*** ✓✓O Reduce their savings./ *Verminder hul spaargeld*	2O reason (2)	D L4 M
4.2.6	✓✓O It reduces the term of the loan./ *Dit verminder die termyn van die lening* **OR/OF** ✓✓O It reduces the interest amount to be paid./ *Dit verminder die bedrag betaalbaar*	2O reason (2)	D L4 M

QUESTION/*VRAAG* 5 [32 MARKS/*PUNTE*]			
Q/*V*	**Solution/*Oplossing***	**Explanation/*Verduideliking***	**T/L**
5.1.1	688 000 000 000✓✓ A	2A correct answer (2)	D L1 M
5.1.2	✓RT 26 : 40 : 688✓A 13 : 20 : 344✓CA	1RT correct values 1A correct order 1CA simplification (3)	D L2 M
5.1.3	Net worth/*Netto waarde* ✓MA ✓RT = \$688 – \$(190 + 144 + 114 + 107) = \$688 – \$555 ✓CA = \$133 billion/*miljard*	1RT correct values 1MA subtracting from total 1CA simplification in billion dollars (3)	D L2 M
5.1.4	Difference/*verskil* ✓RT ✓M = \$11,6 billion/*miljard* – \$8,4 billion/*miljard* = \$3,2 billion/*miljard* ✓CA	1RT correct values 1M subtracting 1CA simplification **NPU** (3)	D L2 E
5.1.5	Amount in rands/ *Bedrag in rande* ✓MA $= \frac{\$5{,}4\ billion/miljard}{\$0{,}057} \times R1$ = R94,737 billion/*miljard* ✓A ✓A ≈ R95 billion/*miljard*/*R95 000 000 000*	1MA dividing by exchange rate 1A simplification 1A correct rounding (3)	F L2 M
5.2.1	✓✓O A Single trip is a trip taken by taxi to a particular destination without going back (i.e. no return)./ *'n Enkelrit is 'n rit wat per taxi na 'n spesifieke bestemming geneem word sonder om terug te gaan* **OR/OF** A Single trip is a trip taken by taxi from a pick-up point to a destination.✓✓O *'n Enkelrit is 'n rit wat per taxi vanaf die optelpunt tot eindpunt.*	2O explanation (2)	F L1 E

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
5.2.2	**A** = R50 + (10km – 3km) × R15 ✓A = R50 + R105 ✓MA = R155 ✓A	1A calculating number of km 1A adding fixed cost 1A value of A **AO** (3)	F L2 M
5.2.3	Total cost (in rands) per single trip/ *totale koste (in rand) per enkelrit* = R50 + (number of km – 3km) × R15 ✓MA ✓MA	1MA number of km minus 3 1MA multiplying and adding. (2)	F L2 D
5.2.4	Total distance/ *Totale afstand* R1 505 = R50 + (unknown dist. – 3) ×R15 ✓SF ∴ Unknown dist. = (1 455 ÷ 15) + 3 ✓MA ✓M ✓M = 100 km ✓CA **OR** Total distance/ *Totale afstand* = R1 505 – R50 ✓MA = R1 455 ✓A $= \frac{R1\,455}{R15}$ ✓M = 97 km + 3 km ✓M = 100 km ✓CA	1SF substituting into the formula 1MA changing the subject of the formula 1M dividing by cost per km 1M adding free km 1CA total distance 1MA subtracting fixed cost 1A cost 1M dividing by cost per km 1M adding free km 1CA total distance **NPU** (5)	F L2 M

Q/*V*	Solution/*Oplossing*	Explanation/*Verduideliking*	T/L
5.2.5	Total cost for taxi waiting for */totale koste van taxi wat wag vir* Doris = R305 + R200 ✓RT ✓MA = R505 ✓CA Total cost for Doris calling the taxi back/*Totale koste wanneer Doris die taxi laat terugkom* = R305 × 2 ✓M = R610 ✓CA Her claim is not valid/*Haar bewering is nie geldig nie* ✓O	1RT cost for 20km 1MA adding return trip 1CA total cost 1M multiplying by 2 1CA total cost 1O conclusion (6)	F L4 M

TOTAL/*TOTAAL*: 150

NOTES	
1.1.4	VAT INCL/BTW = $\frac{115}{100}$ × R1 305,95 ✓MA = R1 501,84 VAT/BTW = R1 501,84 – R1 305,95 ✓M = R195,89
1.1.6	R1 305,95 – R57,96 – R204,48 – R665,056 = R378,45 ✓CA 1 mark only
2.1.4	Difference = 11,2 – 8,5 ✓RT = 2,7 % difference = $\frac{2,7}{11,2}$ × 100 = 24,10 ✓CA ✓O The department has a surplus
4.1.3	**ACCEPT** Annual tax/*Jaarlikse belasting* = R70 532 + 31% of taxable income above/*van belasbare inkomste bo* 337 800 ✓A = R70 532 + 31% (R466 755,22 – R337 800) ✓SF = R70 532 + (31% × R128 955,22) ✓CA = R70 532 + R39 976,12 = R110 508,12 ✓CA Tax payable/*Belasting betaalbaar* = R110 508,12 – R15 714 – **R7 968** ✓M = R86 826,12 ✓CA

4.2.3	**ACCEPT** ✓O ✓O As the months increase, the interest rate also increases./ *Soos die maande toeneem, styg die rentekoers ook* **OR** ✓O ✓O As the months increase, the monthly repayments also increase./ *Soos die maande toeneem, neem die maandelikse terugbetalings ook toe*

QUESTION 3 of ENGLISH VERSION	
Marks	**Score for candidate**
1	**1**
2	**2**
3	**4**
4	**5**
5	**6**
6	**7**
7	**8**
8	**10**
9	**11**
10	**12**
11	**13**
12	**14**
13	**16**
14	**17**
15	**18**
16	**19**
17	**20**
18	**22**
19	**23**
20	**24**

Question 3.2.4
MUST NOT BE MARKED FOR ENGLISH

QUESTION 4 of AFRIKAANS VERSION	
Marks	**Score for candidate**
1	**1**
2	**2**
3	**4**
4	**5**
5	**6**
6	**7**
7	**8**
8	**10**
9	**11**
10	**12**
11	**13**
12	**14**
13	**15**
14	**17**
15	**18**
16	**19**
17	**20**
18	**21**
19	**23**
20	**24**
21	**25**
22	**26**
23	**27**
24	**29**
25	**30**
26	**31**
27	**32**

Question 4.1.5
MUST NOT BE MARKED FOR ENGLISH