Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
Lefapha la Thuto le Tlhabololo ya Metshameko

NORTH WEST PROVINCE

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY PAPER 2

JUNE 2019

MARKING GUIDELINE

MARKS: 100

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG /RD	Reading from a table/Reading from a graph /diagram
SF	Correct substitution in a formula
O	Opinion/Explanation
P	Penalty, e.g. for no units, incorrect rounding off etc.
R/RCA	Rounding off/ Rounding with CA
NPR	No penalty for rounding OR omitting units
AO	Answer only full marks
MCA	Method with consistent accuracy

This marking guideline consists of 9 pages

NOTE:
- If a learner answers a question TWICE, only mark the FIRST attempt.
- If a learner 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.

QUESTION 1 [36 MARKS]

Ques	Solution	Explanation	T & L
1.1.1	Probability $= \frac{5}{16}$ ✓✓ $= 0,3125$ ✓	1A numerator 1A denominator 1CA decimal number **NPR; AO** (3)	P L2
1.1.2	8 teams points increased ✓ As a percentage $= \frac{8}{16} \times 100\%$ ✓ $= 50\%$ ✓	1A number increased 1MA % with denominator 16 1CA simplification **AO** (3)	D L2
1.1.3	Upper quartile $= \frac{44+40}{2} = 42$ ✓ Lower quartile $= \frac{36+36}{2} = 36$ ✓ IQR $= 42 - 36$ ✓ $= 6$ ✓	1A upper quartile 1A lower quartile 1M subtraction 1CA IQR value **NOTE Max 2 marks if quartiles are swapped and the answer is positive.** (4)	D L3
1.2	Annual taxable income = R1 500 000 ✓ Income tax = $207\ 448 + 41\%(1\ 500\ 000 - 708\ 310)$ ✓ $= 207\ 448 + 41\% \times 791\ 690$ ✓ $= 207\ 448 + 324\ 592,90$ $= 532\ 040,90$ ✓ Total income tax (after rebate) $= 532\ 040,90 - 13\ 635$ ✓ $= 518\ 405,90$ ✓	1A correct bracket 1MCA amount above 1S simplification 1CA tax before rebate 1M subtracting rebate 1CA tax after rebate (6)	F L3
1.3.1	Exchange rate $= \frac{440\ 000\ 000}{3\ 300\ 000\ 000}$ ✓✓ $= 0,133....$ 1 ZAR = 0,13 USD ✓	1A identifying correct values 1MA dividing 1CA answer (3)	F L2
1.3.2	Penalty area $= 16,5\text{ m} \times 40,3\text{ m}$ $= 664,95\text{ m}^2$ ✓ Seed needed $= 664,95\text{ m}^2 \times 150\text{ g/m}^2$ ✓ $= 99\ 742,5\text{ g}$ $= 99,7425\text{ kg}$ ✓ Rye seed $= \frac{3}{5} \times 99,7425\text{ kg}$ ✓ $= 59,8455\text{ kg}$ $\approx 60\text{ kg}$ ✓ Statement is valid ✓ **OR** Penalty area $= 16,5\text{ m} \times 40,3\text{ m}$ $= 664,95\text{ m}^2$ ✓	1A area 1M multiplying with rate 1C Converting to kg 1M working with ratio 1CA mass of rye seed 1O conclusion **OR** 1A area	M L4

	$\frac{3}{5}$ of penalty area $= \frac{3}{5} \times 664,95$ m²✓ $\qquad\qquad = 398,97$ m² Rye seed $= 398,97$ m² $\times 150$ g/m²✓ $\qquad = 59\ 845,5$ g $\div 1\ 000$ $\qquad = 59,84,55$ kg✓ $\qquad \approx 60$ kg✓ Statement is valid✓ **OR** Penalty area $= 16,5$ m $\times 40,3$ m $\qquad\qquad = 664,95$ m²✓ $\frac{3}{5} \times 150 = 90$g rye seed / m²✓ 90 g/m² $\times 664,95$ m²✓ $\qquad = 59\ 845,5$ g $\div 1\ 000$✓ $\qquad = 59,84,55$ kg $\qquad \approx 60$ kg✓ Statement is valid✓	1M working with ratio 1M multiplying with rate 1CA mass of rye seed 1C Converting to kg 1O conclusion **OR** 1A area 1M working with ratio 1M multiplying with rate 1CA mass of rye seed 1C Converting to kg 1O conclusion $\qquad\qquad\qquad\qquad$ (6)	
1.3.3	$10\ 997\ell = 10\ 997 \times 1\ 000$ cm³✓ Inner diameter $= 200$ cm - $2\times 0,5$ cm $\qquad\qquad\qquad = 199$ cm✓ r $= \frac{199}{2} = 99,5$ cm✓ $10\ 997\ 000 = 3,142 \times (99,5)^2 \times \ell$✓ $\ell = \frac{10\ 997\ 000}{31\ 106,5855}$✓ **OR** $\frac{10\ 997\ 000}{3,142\ \times (99,5)^2}$✓ $\qquad = 353,53$ cm✓	1C Conversion 1A calculating inner diameter 1MCA radius 1SF correct values 1M changing the subject of the formula 1CA length **NOTE: Max 5 marks if the inner diameter is not calculated** $\qquad\qquad\qquad\qquad$ (6)	M L3
1.3.4 (a)	**(p):** $P_{\text{(no rain on Friday)}} = 70\%$ **OR** $0,7$✓ **(q):** $P_{\text{(no rain on Sat)}} = 40\%$ **OR** $0,4$✓ **(r):** $P_{\text{(rain on Sat)}} = 20\%$ **OR** $0,2$✓	1A for p 1A for q 1A for r $\qquad\qquad$ (3)	P L2
1.3.4 (b)	$P_{\text{(no rain on Fri and Sat)}} = 0,7 \times 0,8$✓ $\qquad\qquad\qquad = 0,56$ $\qquad\qquad\qquad = 56\%$✓	**CA from 1.3.4 (a)** 1MCA multiplying 1CA answer $\qquad\qquad\qquad\qquad$ (2)	P L3
			[36]
QUESTION 2 [31 MARKS]			
2.1.1	$\mathbf{A} = \frac{2\ 284 - 2\ 367}{2\ 367}$ ✓$\times 100\%$✓ $\qquad = -3,5$ %✓	1MA subtracting correct values 1A denominator 1A negative simplification $\qquad\qquad\qquad\qquad$ (3)	D L2
2.1.2	-9,3 ; -8,2 ; -4,1 ; -3,5 ; -1,2 ; -0,7 ; 0,5 ; 5,2 ; 9,7✓ Median $= -1,2$ % ✓	**CA from 2.1.1** 1MCA arranging 1CA median $\qquad\qquad\qquad\qquad$ (2)	D L3
2.1.3	The number of fatal crashes decreased for the EC, FS, KZN, MP, NW,WC ✓and increased in GP, NC and Lim✓ from 2016 to 2017.✓	1A increased provinces 1A decreased provinces 1A stating period $\qquad$ (3)	D L4

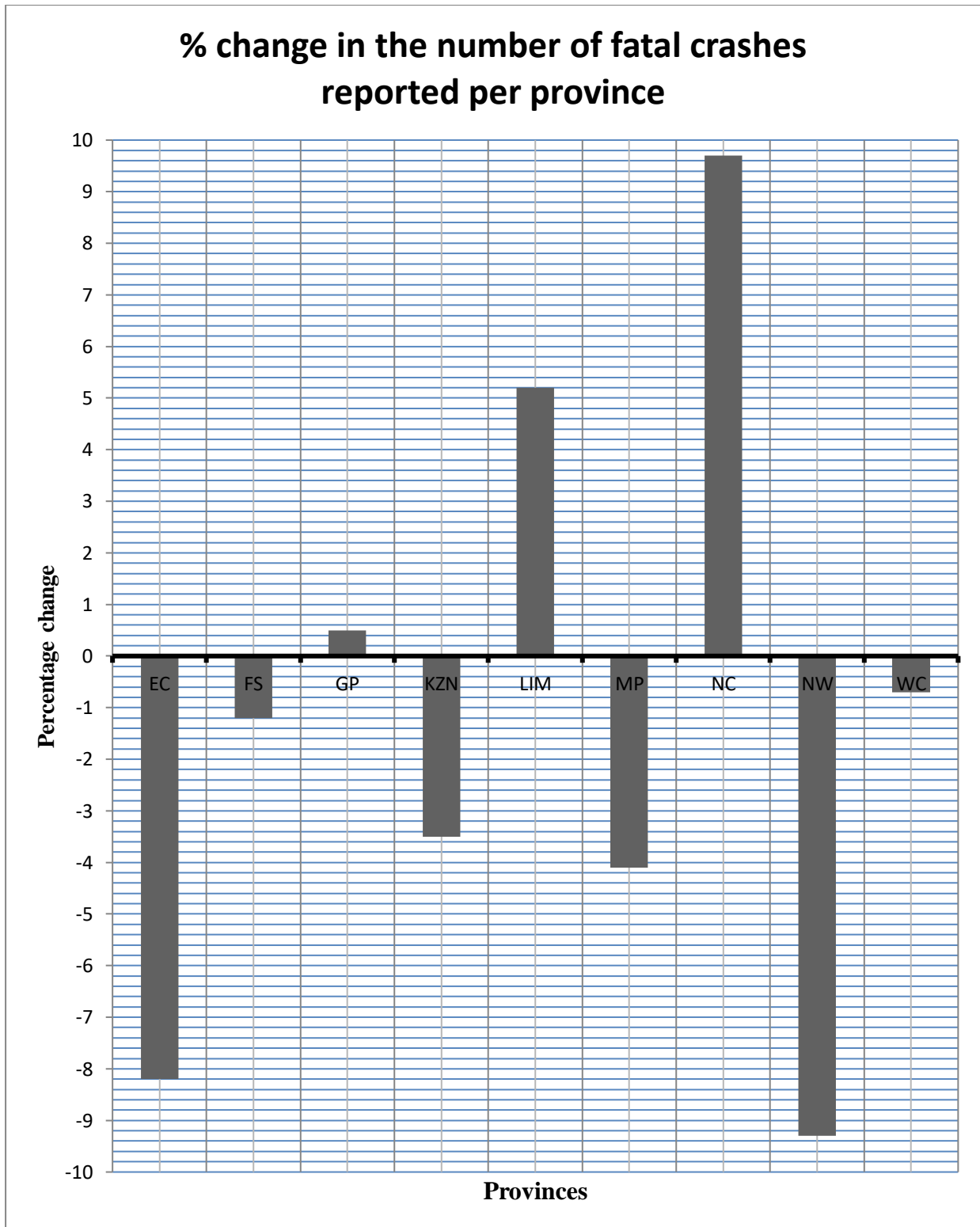|			
2.1.4	Gauteng province is the business hub of South Africa. ✓✓ **OR** There are many people coming and going out of it daily for job opportunities✓✓ **OR** There are many cars✓✓ **Any other relevant answer**	2O reason (2)	D L4
2.1.5	See Answer Sheet	1A Correct type of graph 4A any 2 bars per province drawn correctly (5)	D L3
2.2.1	Less obstructions✓✓ **OR** Less time spent on the road✓✓ **OR** Saves fuel✓✓ **Any other relevant answer**	2O Reason (2)	MP L4
2.2.2	Distance on the map : 4,5 cm✓ **[Accept 4,4 – 4,7cm]** 4,5 cm : 545 km 4,5 : 545 × 100 000✓ 4,5 : 545 00 000 1 : 12111111,11✓ 1 : 12 111 000✓ **OR** 45 mm : 545 km✓ 45 mm : 545 000 000✓ 1 : 121 11111,11✓ 1 : 121 11000✓	1M measure on map 1C conversion 1CA answer 1RCA rounding with CA **NOTE: Measure on final copy** (4)	MP L3
2.3.1	Full tanks $= \frac{545 \text{ km}}{650 \text{ km}}$✓ $= 0,8384615385$ For a return trip $= 0,8384615385 \times 2$✓ $= 1,676923077….\text{tanks}$ $\approx 2 \text{ full tanks}$✓ He will need 2 full tanks.	1MA division 1M multiplying by 2 1RCA answer (3)	MP L4
2.3.2	Total cost of petrol $= 2 \text{ tanks} \times 55\ell$✓ $= 110 \ell$ $110 \ell \times R15,54$✓ $= R1\ 709,40$✓	**CA from 2.3.1** 1MCA multiplying by 55 1M multiplying by R15,54 1CA answer (3)	F L2
2.4	**Total operating cost** $= [788 + (8,03 \times 15,54 + 22,73 + 16,70)] \times 545$✓✓ $= 518957,83^c$✓ $= R5\ 189,58$✓	1SF correct values 1M adding and multiplying 1S answer in cents 1CA answer in rand (4)	MP L3
			[31]

QUESTION 3 [18 MARKS]			
3.1.1	To take struggling runners out of the race because they are not coping✓✓ **OR** Helps organisers to plan for other scheduled events✓✓ **OR** If the road was closed it needs to be opened✓✓ **OR** For runners to know whether they have a realistic chance of finishing the race within the specified time for the race. ✓✓	2O Reason (2)	MP L4
3.1.2	Distance = 90,184 km Time = 5hrs 26min 35sec = 5,443055556 hrs✓ Average speed = $\frac{90,184 \text{ km}}{5,443055556 \text{ hrs}}$✓ = 16,57 km/h✓	1C Conversion of time 1M subject of the formula 1CA answer in correct unit (3) **NPR**	M L2
3.1.3	Slight uphill on Botha's hill✓ Small downhill down Botha's hill✓ Long downhill run to Pine Town✓	1A mark per description (3)	MP L2
3.2	Surface area = 2× 3,142 × 3,25 cm × 15,1 cm✓ = 308,4 cm²✓	1SF into correct formula 1AR answer to 1 d.p (2)	M L2
3.3	Withdrawal fee of R20 000 at Bank A = R5,95 + 0,015 × R20 000✓ = R305,95✓ Fees for 4 withdrawals: R305,95 × 4✓ = R1 223,80✓ Withdrawal fee for R20 000 at Bank B = R4,00 + 1,25% × R20 000 = R254✓ Fees for 4 withdrawals = R254 × 4 = R1 016✓ Difference in fees = R1 223,80 − R1 016 = R207,80✓ Statement is valid✓ **OR** Withdrawal fee of R20 000 at Bank A = R5,95 + 0,015 × R20 000✓ = R305,95✓ Withdrawal fee for R20 000 at Bank B = R4,00 + 1,25% × R20 000 = R254✓ Difference in fees = R305,95 – R254✓ = R51,95✓ Saving on 4 withdrawals = R51,95 × 4✓ = R207,80✓ Statement is valid✓	1SF substituting 1CA weekly charges 1M multiplying by 4 1CA fees for 4 withdrawals 1CA weekly charges 1CA fees for 4 withdrawals 1CA difference 1O conclusion **OR** 1SF substituting 1CA weekly charges 1CA weekly charges 1MCA calculating the difference 1CA difference 1M fees for 4 withdrawals 1CA saving 1O conclusion (8)	F L4
			[18]

QUESTION 4 [15 MARKS]			
4.1	Height $= \frac{186}{100} = 1,86$ m✓ **BMI** $= \frac{86,5 \text{ kg}}{(1,86 \text{ m})^2}$✓ $= 25$ kg/m^2✓ Lies between the 50th and 75th percentile curves✓ The doctor's conclusion was valid✓	1C Conversion 1SF substituting 1A answer 1CA Position in growth chart 1CA opinion (5)	M L4
4.2.1	VAT amount $= \text{R}57,00 \times \frac{15}{115}$✓ $= \text{R}7,43$✓ **OR** Price excl VAT $= \text{R}57,00 \div 1,15$✓ $= \quad \text{R}49,57$ VAT amount $= \text{R}57,00 - \text{R}49,57$ $= \quad \text{R}7,43$✓	1MA multiplying 1A answer **OR** 1MA dividing by 1,15 1A answer (2)	F L2
4.2.2	End of year 1 $= \text{R}50\,000 + (\text{R}50\,000 \times 10,75\%)$✓ $= \text{R}55\,375$✓ End of year 2 $= 55\,375 + (55375 \times 10,75\%)$ $= \text{R}61\,327,81$✓ Monthly fee $= \text{R}57 \times 24$ $= \text{R}1\,368$✓ Total cost of loan $= \text{R}61\,327,81 + \text{R}1\,368 + \text{R}350$✓ $= \text{R}63\,046,81$✓ Difference in amounts $= \text{R}63\,046,81 - \text{R}50\,000$✓ $= \text{R}13\,046,81$ He is correct✓ **OR** Total amount + Interest $= \text{R}50\,000 \times 110,75\% \times 110,75\%$✓✓ $= \text{R}61\,327,81$✓ Monthly fee $= \text{R}57 \times 24$ $= \text{R}1\,368$✓ Total cost of loan $= \text{R}61\,327,81 + \text{R}1\,368 + \text{R}350$✓ $= \text{R}63\,046,81$✓ Difference in amounts $= \text{R}63\,046,81 - \text{R}50\,000$✓ $= \text{R}13\,046,81$ He is correct✓	1MA calculating interest 1CA amount 1CA amount after year 2 1A calculating monthly fee for 24 months 1M adding all values 1CA total cost of loan 1M subtracting amounts 1O verification **OR** 2M multiplying by 110,75% 1CA answer 1A calculating monthly fee for 24 months 1M adding all values 1CA total cost of loan 1M subtracting amounts 1O verification (8)	F L4
		[15]	
		TOTAL: 100	

MARKING GUIDELINE

QUESTION 2.1.5

% change in the number of fatal crashes reported per province

1A correct type of graph   4 × 1A every other two bars correctly plotted   (5)

GRID: MATHEMATICAL LITERACY

GRADE/GRAAD: 12   **MARKS/PUNTE : 100**
TYPE OF ASSESSMENT/SOORT ASSESERING: JUNE EXAMINATION P2

Question	Topic	Section	Assessment Taxonomy Levels			Total
			Routine Procedures 25% ± 5%	Multi-step Procedures 35% ± 5%	Reasoning and reflecting 40% ±5%	
Indicate marks needed →			25	35	40	100
1.1.1	Probability	Expressions of Prob.	3			3
1.1.2	Data Handling	Classifying & organising data	3			3
1.1.3	Data Handling	Summarising Data		4		4
1.2	Finance	Income Tax		6		6
1.3.1	Finance	Exchange rates	3			3
1.3.2	Measurement	Calculating Area			6	6
1.3.3	Measurement	Calculating volume		6		6
1.3.4	Probability	Prediction and reps	3			3
1.3.4 (b)	Probability	To determine possible outcomes		2		2
			12	18	6	36
2.1.1	Data Handling	Representing data	3			3
2.1.2	Data Handling	Summarising Data		2		2
2.1.3	Data Handling	Interpreting data			3	3
2.1.4	Data Handling	Interpreting data			2	2
2.1.5	Data Handling	Representing data		5		5
2.2.1	Maps & Plans	Maps			2	2
2.2.2	Maps & Plans	Scale		4		4
2.3.1	Maps & plans	Planning a trip			3	3
2.3.2	Finance	Tariff	3			3
2.4	Maps & Plans	Planning a trip		4		4
			6	15	10	31

3.1.1.	Maps & Plans	Maps			2	2
3.1.2.	Measurement	Calculating speed	3			3
3.1.3	Maps & Plans	Elevation maps	3			2
3.2	Measurement	Calculating S/Area	2		2	2
3.3	Finance	Bank fees			8	8
			8		10	18
4.1.	Measurement/ DH	BMI/ Growth Charts			5	5
4.2.1	Finance	VAT	2			2
4.2.2	Finance	Interest and loans			8	8
			2		13	15
TOTAL			28	33	39	100
%			28%	33%	39%	100%