Province of the EASTERN CAPE EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

JUNE 2018

MATHEMATICAL LITERACY P2 MARKING GUIDELINE

MARKS: 100

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RM	Reading from a table/Reading from a graph/Read from map
F	Choosing the correct formula
SF	Substitution in a formula
J	Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding Off/Reason
AO	Answer only
NPR	No penalty for rounding

This marking guideline consists of 8 pages.

Ques.	Solution	Explanation	Level
QUESTION 1 [36]			
1.1.1	Total actual expenditure value for 2017 $\checkmark$RT $\checkmark$M = R62 459,75 + R125 000,05 + R63 241,20 +R200 541,65 = R451 243,10 **OR** Total actual expenditure value for 2017 = R461 864,70 – R10 621,60 $\checkmark$RT $\checkmark$M = R451 243,10	1RT Correct values 1M Addition 1RT Correct values 1M Subtraction (2)	L2 F
1.1.2	Actual value is the amount of money that was either received or spent.$\checkmark\checkmark$A Budgeted value is the amount of money that is predicted to be either received or spent $\checkmark\checkmark$A **OR** Amount of money planned to cover all expenses. **Accept any logical explanation.**	2A Explain actual value 2A Explain budgeted value (4)	L4 F
1.1.3	Teaching resources $\checkmark$RT School bought most of the teaching resources the previous year $\checkmark\checkmark$R **OR** They received teaching resources from donors $\checkmark\checkmark$R **Accept any other valid reason.**	1RT 2R Reason (3)	L2 & L4 F
1.1.4	Disagree, because the schools budget for 2018 shows a negative balance .$\checkmark\checkmark$A **OR** From 2016, the balance decreased. $\checkmark\checkmark$A **Accept any other explanation.**	2A Explanation (2)	L4 F
1.1.5	Percentage increase for 2017 $= \dfrac{R164\ 535,70 - R149\ 567,00}{R149\ 567,00} \times 100\%$ $\checkmark$F $\checkmark$SF $= 10\%$ $\checkmark$CA Percentage increase for 2018 $= \dfrac{R180\ 976,00 - R164\ 535,70}{R164\ 535,70} \times 100\%$ $\checkmark$SF $= 9,99\% \approx 10\%$ $\checkmark$CA Statement is valid $\checkmark$O	1F Correct formula 1SF Correct values 1CA Percentage 1SF Correct values 1CA Percentage 1O Valid (6)	L4 F

1.1.6	School fee amount in 2015 $$= \frac{R149\,567,00}{1,1} \quad \checkmark MA$$ $$= R135\,970,00 \quad \checkmark A$$ **OR** School fee amount in 2015 $$= \frac{R149\,567,00}{110\%} \quad \checkmark MA$$ $$= R135\,970,00 \quad \checkmark A$$	1MA 2016 value divided by 1,1 1A 2015 School fee 1MA 2016 value divided by 1,1 1A 2015 School fee (2)	L2 F
1.2.1	**Mean of Excelsior** $$= \frac{15+50+43+34+19+67+29+87+94+79+96+99+43}{13} \quad \checkmark M \;\; \checkmark M$$ $$= \frac{755}{13}$$ $$= 58,08\% \textbf{ OR } 58,1\% \textbf{ OR } 58\% \quad \checkmark CA$$ **Mean of Whittlesea** $$= \frac{25+27+32+38+40+45+53+59+60+67+75+78+84+89+91+97}{16} \quad \checkmark MA$$ $$= \frac{960}{16}$$ $$= 60\% \quad \checkmark CA$$ Statement is valid $\checkmark O$	1M Concept of mean 1M Divide by 13 1CA Mean 1MA Add and divide by 16 1CA Mean 1O Valid NPR (6)	L3 & L4 DH

1.2.2	IQR for Excelsior
	
	 15; 19; 29; 34; 43; 43; 50; 67; 79; 87; 94; 96; 99 $\checkmark M$
	
	 Quartile 2 (Median) = 50% $\checkmark A$
	
	 Quartile 1 (Lower) $= \frac{29+34}{2}$ $\checkmark MA$
	               $= 31,5\%$ $\checkmark CA$
	
	 Quartile 3 (Upper) $= \frac{87+94}{2}$
	               $= 90,5\%$ $\checkmark CA$
	
	 IQR $= 90,5\% - 31,5\%$ $\checkmark M$
	       $= 59\%$ $\checkmark CA$
	
	 Learner's solution is incorrect $\checkmark O$
		1M Arrange
		 1A Concept of median
		 1MA Correct values divided by 2
		 1CA Q1
		
		 1CA Q3
		
		 1M Concept of IQR
		 1CA IQR
		 1O Incorrect (8)
			L2, L3 & L4 DH

| 1.2.3 | P(at least 75%) $= \frac{14}{29}$ ✓A ✓A

    $= 0,35897\ldots$

    $= 0,359$ ✓CA | 1A Numerator
1A Denominator

1CA Rounding (3) | L2
P |

QUESTION 2 [19]

Ques.	Solution	Explanation	Level
2.1			
2.1.1	To see whether they have a market for the super-sized tuna tin. **Accept any other logical explanation**	2A Reason (2)	L4 D

2.1.2	Volume of the original tin $= \pi \times radius^2 \times$ height ✓A
	                 $= 3,142 \times 6$ cm $\times 6$ cm x 7 cm ✓SF
	                 $= 791,784$ cm^3 ✓CA
	
	Volume of the super-sized tin $= \pi \times radius^2 \times$ height ✓A
	                   $= 3,142 \times 12$ cm $\times 12$ cm x 7 cm
	                   $= 3\ 167,136$ cm^3 ✓CA
	
	Not valid ✓O
	The volume of the super-sized tin is not double the volume of the original tin. ✓O
		1A Radius
		1SF Substitution
		1CA Volume
		
		1A Radius
		1CA Volume
		
		1O Not valid
		
		1O Explanation
		           (7)
			L3 &
			L4
			M

2.1.3	Super-sized tuna tin $= \frac{3\ 167,136}{791,784}$ ✓M $= 4$ times bigger ✓CA Suggested price for the super-sized tuna tin $= $ R11,99 $\times 4$ ✓M $= $ R47,96 ✓CA	CA from 2.1.2 1M Dividing 1CA Times bigger 1M Multiplication 1CA Price (4)	L4 M & F

| 2.2 | **Box A**
Across the length $= \dfrac{1\,000\ mm}{240\ mm}$ ✓C ✓M
$\qquad\qquad = 4,16\ldots$
$\qquad\qquad \approx 4$ tins ✓CA

Across the width $= \dfrac{500\ mm}{240\ mm}$
$\qquad\qquad = 2,08$
$\qquad\qquad \approx 2$ tins ✓CA

Height $= \dfrac{200\ mm}{70\ mm}$
$\qquad = 2,85$
$\qquad \approx 2$ tins ✓CA

Number of tins in Box A $= 4 \times 2 \times 2$
$\qquad\qquad\qquad\qquad\ = 16$ tins ✓CA | CA from 2.1.2
1C Diameter cm to mm
1M Dividing
1CA Number of tins across length

1CA Number of tins across width

1CA Number of tins on top of each other

1CA Number of tins in box (6) | L3
M |

QUESTION 3 [26]

Ques.	Solution	Explanation	Level
3.1			
3.1.1	The strip chart is not drawn to scale ✓✓A	2A Reason (2)	L4 M&P
3.1.2	Distance $= 203 + 180$ ✓RM $\qquad\quad = 383$ km ✓CA **OR** Distance $= (662 - 459) + 180$ ✓RM $\qquad\quad = 203 + 180$ $\qquad\quad = 273$ km ✓CA	1RM Correct distances 1CA Distance 1RM Correct values 1CA Distance (2)	L2 M&P
3.1.3	'R' stands for Regional Routes, ✓A 'N' stands for National Routes or freeways. ✓A	1A Regional route 1A National route (2)	L2 M&P
3.1.4	Distance from Aliwal North to Harrismith, including Colesberg ✓RM ✓RM ✓RM $= 74 + 56 + 69 + 36 + 36 + 69 + 56 + 247 + 131 + 102$ ✓M $= 876$ km ✓RM	3RM Correct distances 1M Adding 1CA Distance (5)	L3 M&P

3.1.5	Time spent on the Regional route $$Time = \frac{Distance}{Speed}$$ $$Time = \frac{322}{80} \quad \checkmark M \quad \checkmark SF$$ $$= 4{,}025 \text{ hrs} \quad \checkmark CA$$ Time spent on the national routes $$Time = \frac{Distance}{Speed}$$ $$Time = \frac{554}{100} \quad \checkmark SF$$ $$= 5{,}54 \text{ hrs} \quad \checkmark CA$$ Time spent for travelling and pitstops $= 4{,}025 \text{ hrs} + 5{,}54 \text{ hrs} + 1{,}5 \text{ hrs} \quad \checkmark A \quad \checkmark M$ $= 11{,}065 \text{ hrs} \quad \checkmark CA$ Statement not valid $\checkmark$O	CA from 3.1.4 1M Changing subject of formula 1SF Correct values 1CA Hours 1SF Correct values 1CA Hours 1A Time for pit stops 1M Adding 1CA Total time 1O Not valid (9)	L2 & L3 & L4 M& M& P
3.2	**Total operating costs** **= [Fixed cost + (Petrol factor $\times$ petrol price + Service and Repair cost + Tyre cost)] $\times$ distance travelled** $= [526 + (8{,}03 \times 12{,}87 + 22{,}73 + 16{,}70) \times 876 \quad \checkmark SF$ $= (526 + 103{,}3461 + 22{,}73 + 16{,}70) \times 876 \quad \checkmark S \checkmark M$ $= 668{,}7761 \text{ c} \times 876 \quad \checkmark M$ $= 585\ 847{,}8636 \text{ c} \quad \checkmark S$ $= R5\ 858{,}48 \quad \checkmark CA$	CA from 3.1.4 1SF Correct values 1S Fuel 1M Adding 1M Multiply 1S Answer in cents 1CA Answer in Rand (6)	

QUESTION 4 [19]

Ques.	Solution	Explanation	Level
4.1.1	Amount for Student Service = 18,9 - (5,6 + 2,5 + 2,4 + 1,1 + 1,9 + 2,4) ✓RG = 18,9 – 15,9 ✓M = $3 000 000 **OR** $3 million ✓CA	1RG Correct values 1M Subtract from 18,9 1CA Amount **NB Penalise with 1 mark if not written in millions and 1 mark for incorrect unit** (3)	L2 DH
4.1.2	Salaries and Benefits 2014/2015 $= \frac{18,8}{70,7} \times 100\%$ ✓MA = 26,59123055% ✓CA Salaries and Benefits 2015/2016 $= \frac{16,6}{43,4} \times 100\%$ = 38,24884793% ✓CA Difference in % = 38,24884793% – 26,59123055% ✓M = 11,65761738 ✓CA = 11,7% ✓R Do not penalise in this question if already penalised in 4.1.1	1MA Correct values 1CA Percentage 1CA Percentage 1M Subtracting 1CA Difference 1CA % to 1 decimal place (6) **NB Penalise with 1 mark if not written in millions and 1 mark for incorrect unit**	L2 F
4.1.3	Financial Aid does not appear in the 2014/2015 pie chart ✓✓A	2A Explanation	L4 P
4.1.4	Amounts do add up to $70,7 million **OR** $43,4 million ✓✓A	2A Explanation	L4 DH

       Please turn over

4.2	First year = 35 000 × 1,075	1M Correct %	L3 &
	= R37 625 ✓CA	1CA Amount	L4
			F
	Second year = 37 625 × 1,075		
	= R40 446,88 ✓CA	1CA Amount	
	✓M		
	Third year = 40 446,88 × 1,0775	1M Correct %	
	= R43 581,51 ✓CA	1CA Amount	
	Statement is not valid ✓O	1O Not valid	
	OR		
	✓M ✓M ✓M ✓M		
	Final Amount = 35 000 × 1,075 × 1,075 × 1,0775		
	= R43 581,51 ✓CA		
	Statement not valid ✓M	(6)	
		TOTAL:	**100**