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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P 1

FEBRUARY/MARCH 2018

MARKING GUIDELINES

MARKS: 150

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

These marking guidelines consist of 12 pages.

Question 1 [30Marks] AO			
Ques	Solution	Explanation	Topic/L
1.1.1	$3\frac{1}{2}$ years ✓✓A OR Three and half a years ✓✓A OR 3,5 years ✓✓A	2A numerical period OR 2A period in words 3 years 6 months (only 1 mark) (2)	M L1
1.1.2	Total Repayment Cost = R1 078,26 × 42 ✓M/A = 45 286,92 ✓CA	1MA multiply term by instalment 1CA Total cost From Q1.1.1. (2)	F L1
1.1.3	 $\text{Discount} = \text{R}29\,999,00 \times 15\%$ ✓M = R4 499,85 ✓A	1M calc. discount 1A saving (2)	F L1
1.2.1	$\text{AD} : \text{CB} = 10,9 : 9,45$ ✓M = 218 : 189 ✓CA	1M ratio form 1CA simplified form Accept unit ratio (1: 0,87) OR (1,15 : 1) (2)	MP L1
1.2.2	$\text{CD} = 125,92\text{m} - (57,5 + 10,9 + 9,45)$ ✓M/A = 48,07m ✓CA	1M/A subtracting all lengths 1CA length (2)	M L1
1.2.3	$\text{Radius} = \frac{4,73}{2} \text{m}$ ✓M = 2,365 m ✓A	1M dividing by 2 1A simplification NPR (2)	M L1
1.2.4	$\text{Total Cost} = \text{R}97,56/\text{m} \times 57,5\text{m}$ ✓M/A = R5 609,70 ✓CA	1M/A multiply cost by correct distance 1CA simplification (2)	F L1
1.3.1	C ✓✓A	2A city (2)	D L1
1.3.2	$\text{Range} = 8^{\circ}\text{C} - (-7^{\circ}\text{C})$ ✓MA = 15°C ✓CA	1MA subtracting correct values 1CA temperature (2)	D L1

Ques	Solution	Explanation	Topic/L
1.3.3 (a)	B ✓✓A	2A city (2)	P L1
1.3.3 (b)	Likely OR less likely ✓✓A	2A correct words (2)	P L1
1.4.1	Bar graph ✓✓A OR Single bar graph. ✓✓A OR Vertical bar graph ✓✓A OR Column graph ✓✓A	2A correct type (2)	D L1
1.4.2	✓✓A Three hundred and sixty one thousand nine hundred and forty eight.	2A number in words (2)	M L1
1.4.3	Q 5 ✓✓A	2A correct question (2)	D L1
1.4.4	Average time per mark = $\frac{180}{150}$ min ✓MA = 1,2 min ✓CA OR Average time per mark = $\frac{3 \text{ hours}}{150}$ ✓MA = 0,02 × 60 min = 1,2 min ✓CA OR 150 marks : 180 min ✓MA 1mark : 1,2 min ✓CA	1MA numerator and denominator 1CA simplification OR 1MA numerator and denominator 1CA simplification OR 1MA correct ratio 1CA simplification (2)	D L1
			[30]

Question 2 [44 Marks]			
Ques	Solution	Explanation	Topic/L
2.1.1	<p>Stop order: an instruction to an employer or bank to pay / divert monthly or transfer regularly a certain amount to a person or an account. ✓✓ O</p> <p style="text-align: center;">OR</p> <p>Stop order: an instruction that an employee (individual) issue to the employer (bank) to make a series of future dated regular deductions ✓✓ O</p> <p style="text-align: center;">OR</p> <p>Stop order: Future dated regular monthly deductions ✓✓ O</p>	<p>2O explanation</p> <p>(2)</p>	F L1
2.1.2	<p style="text-align: center;">✓ M/A</p> <p>Difference = R940 465,89 – R536 523,25</p> <p style="text-align: center;">= R403 942,64 ✓ C/A</p>	<p>1M/A subtraction of correct value</p> <p>1CA simplification</p> <p>AO</p> <p>(2)</p>	F L1
2.1.3	<p>Number of years (2017 – 2029) = 12 ✓ M/A</p> <p>Number of months in 12 years = 12×12 = 144 ✓ C</p> <p>Number of months from 10 May to 1 November = 6 ✓ A</p> <p>Total number of contributions = $144 + 6$ = 150 ✓ CA</p>	<p>1M/A calculating years</p> <p>1C converting years to months</p> <p>1A additional months</p> <p>1CA total number of months.</p> <p>AO</p> <p>(4)</p>	F L2
2.1.4	<p>Total contribution value</p> <p style="text-align: center;">✓ M/A</p> <p>= $(5 \times 12) \times R740,22$ ✓ RT</p> <p>= R44 413,20 ✓ CA</p>	<p>1M/A multiplying (5 and 12)</p> <p>1RT reading monthly contribution</p> <p>1CA total contribution</p> <p>AO</p> <p>NPR</p> <p>(3)</p>	F L2
2.1.5	<p style="text-align: center;">✓✓ A</p> <p>a greater / an increased/ a higher / more/ bigger/ larger/ inflated / better</p>	<p>2A correct missing words</p> <p>(2)</p>	F L1

Ques	Solution	Explanation	Topic/L
2.1.6	$\begin{aligned} & \checkmark\text{MA} \\ & \text{R}740,22 + \text{R}740,22 \times 8,5\% \\ & = \text{R}740,22 + \text{R}62,9187 \quad \checkmark\text{M} \\ & = \text{R}803,14 \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} & \checkmark\text{M} \\ & \text{R}740,22 \times 108,5\% \quad \checkmark\text{MA} \\ & = \text{R}803,14 \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} & 740,22 \times 8,5\% = 62,9187 \quad \checkmark\text{MA} \\ & \therefore 803,14 - 62,9187 = 740,22 \quad \checkmark\text{M} \end{aligned}$	<p>1MA percentage</p> <p>1M adding two values</p> <p>OR</p> <p>1M multiplying</p> <p>1MA 108,5%</p> <p>OR</p> <p>1MA percentage</p> <p>1M subtracting values</p> <p style="text-align: right;">(2)</p>	F L1
2.2.1	$\begin{aligned} \text{Hourly overtime rate} & = \text{R}17,76 \times 1\frac{1}{3} \quad \checkmark\text{MA} \\ & = \text{R}23,68 \quad \checkmark\text{CA} \end{aligned}$	<p>1MA hours</p> <p>1CA rate</p> <p>AO</p> <p style="text-align: right;">(2)</p>	F L1
2.2.2	$\begin{aligned} \text{2017 Sunday wage rate} & = 19,39 \times 150\% = \text{R}29,09 \quad \checkmark\text{MA} \quad \checkmark\text{A} \\ \\ \text{Total wage} & = 3 \times 9 \times \text{R}29,09 \quad \checkmark\text{A} \quad \checkmark\text{M} \\ & = \text{R}785,43 \quad \checkmark\text{CA} \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \text{2016 Sunday wage rate} & = \text{R}17,90 \times 150\% = \text{R}26,85 \quad \checkmark\text{MA} \quad \checkmark\text{A} \\ \\ \text{Total wage} & = 3 \times 9 \times \text{R}26,85 \quad \checkmark\text{A} \quad \checkmark\text{M} \\ & = \text{R}724,95 \quad \checkmark\text{CA} \end{aligned}$	<p>1MA increasing by 150%</p> <p>1A Sunday hourly rate</p> <p>1A hours per day</p> <p>1M multiplying</p> <p>1CA wage</p> <p>AO</p> <p>1MA increasing by 150%</p> <p>1ASunday hourly rate</p> <p>1A hours per day</p> <p>1M multiplying</p> <p>1CA wage</p> <p>NPR</p> <p style="text-align: right;">(5)</p>	F L2

Ques	Solution	Explanation	Topic/L
2.2.3 (a)	$\% \text{ increase} = \frac{17,76 - 16,40}{16,40} \times 100\% \quad \checkmark M$ $= 8,29268\dots\%$ $\approx 8,3\%$ <p style="text-align: center;">OR</p> $\% \text{ increase} = \frac{19,39 - 17,90}{17,90} \times 100\% \quad \checkmark M$ $= 8,324\dots\%$ $\approx 8,3\%$ <p style="text-align: center;">OR</p> $R16,40 \times 1,083 = R17,76 \quad \checkmark M$ <p style="text-align: center;">OR</p> $R17,90 \times 1,083 = R19,39 \quad \checkmark M$ <p style="text-align: center;">OR</p> $R17,76 \div 1,083 = R16,40 \quad \checkmark M$ <p style="text-align: center;">OR</p> $R19,39 \div 1,083 = R17,90 \quad \checkmark M$	1M percentage 1A correct values used OR 1M percentage 1A correct values used OR 1M percentage 1A correct values used OR 1M percentage 1A correct values used OR 1M percentage 1A correct values used OR 1M percentage 1A correct values used (2)	F L1
2.2.3 (b)	$A \times 108,3\% = 21,93 \quad \checkmark RT$ $A = \frac{21,93}{108,3\%} \quad \checkmark M$ $= R20,25 \quad \checkmark CA$ <p style="text-align: center;">OR</p> $A = \frac{21,93}{1,083} \quad \checkmark M$ $= R20,25 \quad \checkmark CA$	1RT reading values 1M dividing by 108,3% 1CA amount OR 1RT reading values 1M dividing by 108,3% 1CA amount AO (3)	F L2

Ques	Solution	Explanation	Topic/L
2.2.4	<p>2017</p> <p>Total Weekly Wage \checkmarkMA \checkmarkRT $= (6 \times 9 \times R17,76) + (9 \times 150\% \times R17,76)$</p> <p>$= R959,04 + R239,76$</p> <p>$= R1\ 198,80 \checkmark$CA</p> <p style="text-align: center;">OR</p> <p>2016</p> <p>Total weekly wage \checkmarkMA \checkmarkRT $= (6 \times 9 \times R16,40) + (9 \times 150\% \times R16,40)$</p> <p>$= R1\ 107,00 \checkmark$CA</p>	<p>1RT reading value from the table</p> <p>1MA multiply with no. of days and hours</p> <p>1CA simplification</p> <p style="text-align: center;">OR</p> <p>1RT reading value from the table</p> <p>1MA multiply with no. of days and hours</p> <p>1CA simplification</p> <p style="text-align: right;">(3)</p>	F L2
2.3	<p>Total Income for the day $= 7 \times R70 + 35 \times R50 + 4 \times R75 \checkmark\checkmark$RT \checkmarkM</p> <p>$= R490 + R1\ 750 + R300$</p> <p>$= R2\ 540 \checkmark$CA</p> <p style="text-align: center;">OR</p> <p>Income from bakkies $= 7 \times R70 = R490 \checkmark$A Income from Cars $= 35 \times R50 = R1\ 750 \checkmark$A Income from minibus $= 4 \times R75 = R300 \checkmark$A Total Income $= R2\ 540 \checkmark$CA</p>	<p>2RT correct values</p> <p>1M multiply price by vehicle type</p> <p>1CA total income</p> <p style="text-align: center;">OR</p> <p>1A bakkies 1A cars 1A minibus 1CA total income AO</p> <p style="text-align: right;">(4)</p>	F L1

QUESTION 3 [25 MARKS]			
Ques	Solution	Explanation	Topic/L
3.1.1	\checkmark RT \checkmark RT 6 months to 2 years. OR ($\frac{1}{2}$ year to 2 years) \checkmark RT \checkmark RT OR 6 months to 24 months \checkmark RT \checkmark RT	2RT age Accept 23-24 months (2)	M L1
3.1.2	8 kg $\checkmark\checkmark$ RT	2RT mass/weight (2)	M L1
3.1.3	12 months to 15 months $\checkmark\checkmark$ RT	2RT (one age in this range) (2)	M L1
3.1.4	February $\checkmark\checkmark$ A	2A correct month (2)	M L1
3.1.5	$\text{BMI} = \frac{\text{weight (in kg)}}{(\text{height in m})^2}$ $19,5 \text{ kg/m}^2 = \frac{11,2}{(\text{height in m})^2} \quad \checkmark \text{ SF}$ $\checkmark \text{ M}$ $\text{Height} = \sqrt{\frac{11,2}{19,5}} \quad \checkmark \text{ M}$ $= 0,758 \text{ m} \quad \checkmark \text{ CA}$	1SF correct values 1M new subject 1M finding sq. root 1CA simplification AO (4)	M L2
3.2.1	$\text{Distance} = \frac{55 \text{ litre}}{7,6 \text{ litre}} \times 100 \text{ km} \quad \checkmark \text{ MA}$ $= 723,68$ $\approx 724 \text{ km} \quad \checkmark \text{ R}$	1MA multiply by 100 1MA divide by 7,6 1R distance AO (3)	M L2
3.2.2	$\text{Average speed} = \frac{\checkmark \text{ SF}}{189} = \frac{189}{01\text{h}45} = \frac{189}{1,75} \quad \checkmark \text{ C}$ $= 108 \text{ km/h} \quad \checkmark \text{ CA}$	1C to hours 1SF correct values 1CA Average speed AO (3)	M L2
3.3.1	$\text{Volume} = 53,34\text{cm} \times 17,78\text{cm} \times 42,32 \text{ cm} \quad \checkmark \text{ SF}$ $= 40 \ 135,66 \text{ cm}^3 \quad \checkmark \text{ CA}$ $= \frac{40 \ 135,66}{1000} \text{ litres} \quad \checkmark \text{ MA}$ $= 40 \text{ litres} \quad \checkmark \text{ R}$	1SF correct substitution 1CA volume 1MA dividing by 1 000 1R volume in litres (4)	M L3
3.3.2	$P_{(U)} = \frac{3}{12} \text{ or } \frac{12}{48} \quad \checkmark \text{ A}$ $= 0,25 \quad \checkmark \text{ CA}$	1A numerator 1A denominator 1CA decimal AO (3)	P L2
			[25]

QUESTION 4 [19 MARKS]			
Ques	Solution	Explanation	Topic/L
4.1.1	✓ A ✓ A N10 and N2	1A N10 1A N2 (2)	MP L1
4.1.2	✓✓ RT Mountain Zebra N.P	2RT correct name (2)	MP L1
4.1.3	Kirkwood ✓✓ A	2A correct hometown (2)	MP L2
4.1.4	$\begin{aligned} \text{Distance} &= 25 \text{ km} + (207 \text{ km} - 22 \text{ km}) + 24 \text{ km} \\ &= 234 \text{ km} \end{aligned}$ <p style="text-align: center;">OR</p> $\begin{aligned} \text{Distance} &= 24 \text{ km} + (380 \text{ km} - 195 \text{ km}) + 25 \text{ km} \\ &= 234 \text{ km} \end{aligned}$	1RT correct distances 1M adding 1CA difference OR 1RT correct distances 1M adding 1CA difference AO (3)	MP L2
4.2.1	3750 mm ✓✓ A	2A distance (2)	MP L1
4.2.2	Total exterior length of western wall $= 3\,550 \text{ mm} + 3750 \text{ mm}$ ✓ A $= 7\,300 \text{ mm}$ $= 7,3 \text{ m}$ ✓ C <p style="text-align: center;">OR</p> Total exterior length of western wall $= 3,55 \text{ m} + 1,7 \text{ m} + 2,05 \text{ m}$ ✓ A $= 7,3 \text{ m}$ ✓ C	1A adding 3 correct distances 1C conversion to m <p style="text-align: center;">OR</p> 1A adding correct distances of Eastern wall (opp. Side //) 1C conversion to m AO (2)	MP L1
4.2.3	Living room. ✓✓ A	2A (Passage and/or Kitchen maximum 1 mark) (2)	MP L1
4.2.4	Bedroom 2 ✓✓ A	2A room (2)	MP L1
4.2.5	Wash basin/sink/water basin OR Shower OR ✓✓ A Cupboard	2A any item (2)	MP L1
			[19]

QUESTION 5 [32MARKS]			
Ques	Solution	Explanation	Topic/L
5.1.1	Numerical ✓✓A	2A answer (2)	D L1
5.1.2	50% ✓✓A	2A answer (2)	D L1
5.1.3	Range = Maximum - minimum ✓M 34 = 90 - F ✓RT F = 90 - 34 = 56 ✓CA	1M range concept (can be implied) 1RT correct values 1CA simplification AO (3)	D L2
5.1.4	Median % = $\frac{67 + 69}{2}$ ✓M = 68 ✓A	1M concept of median 1A median AO (2)	D L2
5.1.5	Inter-quartile range = $Q_3 - Q_1$ ✓M Inter-quartile range = 70 - 20 ✓RT = 50 ✓CA	1M IQR concept(implied) 1RT correct values 1CA simplification AO (3)	D L2
5.1.6	66 ✓✓A	2A mode (2)	D L1
5.1.7	Mean = $\frac{\text{sum of the marks}}{\text{total number of learners}}$ $70 = \frac{1741 + H}{26}$ ✓MA 1 820 = 1 741 + H H = 79 ✓CA	1MA mean concept (implied) 1A adding values 1CA value of H AO (3)	D L3
5.1.8	$P_{\text{(equal marks)}} = \frac{13}{26}$ ✓A = $\frac{1}{2}$ ✓CA	1A numerator 1A denominator 1CA simplification AO (3)	P L3

Ques	Solution	Explanation	Topic/L
5.2.1	$Q = 288\,912 + 393\,954 + 94\,552 + 192\,933 + 650\,033 + 299\,994 + 575\,371 + 312\,273 + 372\,090$ $= 3\,180\,118 \checkmark CA$ <p style="text-align: center;">OR</p> $Q = 15\,353\,036 - 12\,172\,919 = 3\,180\,118 \checkmark CA$	1MA adding all Non-literate adults 1CA Simplification OR 1MA subtracting Literate from Total 1CA simplification AO (2)	D L1
5.2.2	$\% \text{ literate} = \frac{12172919}{15353036} \times 100 \checkmark M$ $\approx 79,3 \checkmark CA$ <p style="text-align: center;">OR</p> $\% \text{ literate} = 100 - \left(\frac{3\,180\,118}{15\,353\,036} \times 100 \right) \checkmark M$ $\approx 100 - 20,71$ $\approx 79,3 \checkmark CA$	1RT numerator and denominator 1M multiply by 100 1CA answer AO 1RT numerator and denominator 1M multiply by 100 1CA answer NPR (3)	D L2
5.2.3	Non Literate: Literacy $= 650\,033 : 1\,956\,497 \checkmark RT$ $= \frac{650\,033}{650\,033} : \frac{1\,956\,497}{650\,033} \checkmark MA$ $= 1 : 3,009842577$ $\approx 1 : 3 \text{ or } 1 : 3,01 \text{ or } 1 : 3,0099 \checkmark CA$	1RT both values 1MA ratio in correct order CA unit ratio NPR (3)	D L2
5.2.4	$244\,282; 609\,029; 760\,029; 784\,347; 922\,171; 1\,120\,567; 1\,762\,494; 1\,956\,497; 4\,013\,463$	2MA arranging (2) (Descending 1 Mark; Omitting 1 value 1 mark)	D L1
5.2.5	Northern Cape (NC) $\checkmark\checkmark A$	2A correct province (2)	D L1
			[32]

TOTAL: 150