basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

NOVEMBER 2011

FINAL MEMORANDUM APPROVED 04 NOVEMBER 2011

MARKS: 150 **This memorandum consists of 15 pages**

Symbol	Explanation
M	Method
M/A	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG	Reading from a table/Reading from a graph
SF	Correct substitution in a formula
O	Opinion/Example
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off

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QUESTION 1 [34 MARKS]			
Ques	**Solution**	**Explanation**	**AS**
1.1.1	$241,50(124,37 - 121,79) + \sqrt{232,5625}$ $= 623,07 + 15,25$ ✓A $= 638,32$ ✓CA	1A simplifying both terms 1CA simplification **Answer only full marks** (2)	12.1.1
1.1.2	$25,5 \div 100$ ✓M $= 0,255$ m ✓A	1M dividing by 100 1A simplification **Answer only full marks** (If 0,26 penalize 1 mark) (2)	12.3.2
1.1.3	$2\frac{1}{2} \times 12$ ✓M $= 30$ eggs ✓CA **OR** $12 + 12 + 6$ ✓M $= 30$ eggs ✓CA	1M concept of dozen 1CA simplification **Answer only full marks** (2)	12.1.2
1.1.4	01:04 ✓✓A **OR** 1:04 am **OR** 4 min after 1 in the morning.	2A answer (2)	12.3.2
1.1.5	36 m ÷ 4 = 9 m ✓M ✓A	1M dividing 1A answer **Answer only full marks** (2)	12.3.1
1.1.6	1 **OR** 100% **OR** certain **OR** definite ✓✓A	2A answer (2)	12.4.5

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Ques	Solution	Explanation	AS
1.2.1	$20 \times 0,95$ ✓M = 19 Botswana pula (BWP) ✓A **OR** 1 Botswana pula (BWP) $= \frac{1}{0,95}$ ZAR $= 1,0526316$ ZAR ✓M R20 $= \frac{20}{1,0526316}$ BWP = 19 BWP ✓A **OR** $2 \times 20 \times 0,95$ ✓M = 38 Botswana pula (BWP) ✓A	1M multiplying 1A simplification **Answer only full marks** Penalty of 1 mark if answer is in rand. 1M dividing 1A simplification 1M multiplying 1A simplification (2)	12.1.3
1.2.2	Total amount due ✓M/A = (10 × 360 286 ZMK) + (8 × 85 134 ZMK) − 1 021 605 ZMK ✓CA = (3 602 860 + 681 072 − 1 021 605) ZMK = 3 262 327 ZMK ✓CA	1M /A substitution 1CA multiplication 1CA simplification **Answer only full marks** No penalty if answer is given with comma separators for thousands (3)	12.2.1
1.2.3	Speed $= \frac{180\text{ km}}{2,25\text{ h}}$ ✓SF ✓C **OR** $\frac{180\text{ km}}{2\frac{1}{4}\text{ h}}$ **OR** $\frac{180\text{ km}}{2\text{ h }15\text{ min}}$ = 80 km/h ✓CA **OR** Speed $= \frac{180\text{ km}}{135\text{ min}}$ ✓SF = 1,33 km/min × 60 min/h ✓C = 80 km/h ✓CA	1SF substitution 1C conversion to hours 1CA simplification **Answer only full marks** 1SF substitution 1C conversion to hours 1CA simplification (3)	12.2.1

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Ques	Solution	Explanation	AS
1.3.1 (a)	500 000 000 – 106 000 000 ✓M = 394 000 000 ✓A **OR** 500 million – 106 million ✓M ✓A = 394 million	1M subtracting 1A simplification **Answer only full marks** Penalty 1 mark if answer negative. (2)	12.1.1
1.3.1 (b)	106 000 000 – 50 880 000 ✓M = 55 120 000 ✓A **OR** 106 million – 50,88 million ✓M = 55,12 million ✓A	1M subtracting (one value must be correct) 1A simplification **Answer only full marks** (2)	12.1.1
1.3.1 (c)	✓A $\frac{230\,000\,000}{500\,000\,000}\times 100\%$ ✓M **OR** ✓A $\frac{230 \text{ million}}{500 \text{ million}}\times 100\%$ ✓M = 46 % ✓CA = 46 % ✓CA	1M concept 1A correct values 1CA simplification (3)	12.1.1
1.3.2 (a)	Cellphone **OR** laptop **OR** iPad **OR** tablet **OR** GPS-device ✓A	1A answer (accept brand names) (1)	12.4.4
1.3.2 (b)	30 % ✓RG	1RG answer (1)	12.4.4
1.3.2 (c)	100 % – 12 %✓M = 88 % ✓A	1M subtraction from 100% 1A simplification **Answer only full marks** (2)	12.4.4
1.3.2 (d)	✓RG 27 % × 106 million ✓M = 28 620 000 **OR** 28,62 million ✓CA	1RG correct values 1M concept of percentage 1CA simplification **Answer only full marks** (3)	12.4.4 12.1.1
			[34]

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QUESTION 2 [28 MARKS]			
Ques	**Solution**	**Explanation**	**AS**
2.1.1	27 °C ✓RG	1RG answer No penalty for omitting unit (1)	12.4.4
2.1.2	Harare ✓✓RG **OR** New Delhi ✓✓RG	2RG answer (maximum 1 mark if two cities given and one is wrong) (2)	12.4.4
2.1.3	Amsterdam ✓RG	1RG answer (1)	12.4.4
2.1.4	Harare ✓✓RG	2RG answer (2)	12.4.4
2.1.5	8 °C – (–2 °C) ✓M/A = 10 °C ✓CA **OR** ✓M/A Start at (–2 °C) and count until 8 °C ∴ Range = 10 °C ✓CA	1M/A concept of range 1CA simplification **Answer only full marks** (2)	12.4.3
2.1.6	✓SF Temperature in °F = 1,8 × 13° + 32° = 55,4° ✓CA	1SF substitution of **13°** 1CA simplification **Answer only full marks** (2)	12.3.2
2.2.1	Northern Cape ✓RG	1RG answer (1)	12.4.4
2.2.2	✓RG Free State and Western Cape ✓RG	2RG answer (2)	12.4.4
2.2.3	✓✓RG Mpumalanga **OR** Western Cape ✓✓RG	2RG answer (penalty of 1 if one province is wrong) (2)	12.4.4
2.2.4	✓M 100 % – (6.5 + 29.7 + 9,5 + 10,6 +13,9 + 10,6 + 1,4 + 7,6) % = 10.2 % ✓A	1M concept 1A simplification **Answer only full marks** (2)	12.4.4

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Ques	Solution	Explanation	AS
2.2.5	$\frac{3\ 249\ 415}{6{,}5\%}$ ✓M ✓RG $= \frac{3\ 249\ 415}{0{,}065}$ **OR** $\frac{3\ 249\ 415}{6{,}5} \times \frac{100}{1}$ = 49 991 000 ✓CA **OR** 6,5% of the population = 3 249 415 ✓RG 1% of the population = 499 910 ✓M 100% of the population = 49 991 000 ✓CA	1M concept 1RG correct percentage 1CA simplification (maximum 2 marks if they use land area percentage) Penalty 1 mark if answer is not a whole number **Answer only full marks** (3)	12.1.1 12.4.4
2.3.1	1 hour ✓✓RG	2RG answer (accept 1:00 or 01:00) (2)	12.2.3
2.3.2	✓✓RG Accept any value more than 3 hours and up to 4 hours **OR** 3 < hours ≤ 4 **OR** (3 ; 4]	2RG answer (2)	12.2.3
2.3.3	R20,00 ✓✓RG	2RG answer (2)	12.2.3
2.3.4	R7,00✓ ✓RG	2RG answer (2)	12.3.2
			[28]

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QUESTION 3 [23 MARKS]

Ques	Solution	Explanation	AS
3.1.1	✓M **A** = R400 – R210 = R190 ✓A ✓M **B** = R25,00 × 30 = R750 ✓CA ✓M **C** = 4 × R110 = R440 ✓A ✓M **D** = 4 × R125 = R500 ✓A	1M subtracting 1A simplification 1M multiplying 1CA simplification (maximum 1 mark if not using 30 days) 1M multiplying 1A simplification 1M multiplying 1A simplification **Answer only full marks** (8)	12.1.3
3.1.2	✓M R2 500 – R2 330 = R170 ✓CA	1M subtracting 1CA simplification (no penalty if answer is negative) (2)	12.1.3
3.1.3	Use at least one of her weekend entertainment money allowances ✓✓A **OR** Reduce food expenses to save R30. ✓✓A **OR** (any other suitable answer)	2A answer (2)	12.1.2

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Ques	Solution	Explanation	AS
3.2	$A = P(1+i)^n$ ✓A $= R125\left(1+\frac{8}{100}\right)^3$ ✓M **OR** $R125\ (1+0{,}08)^3$ $= R157{,}464$ $\approx R157{,}46$ ✓CA **OR** For a year: $R125 \times 52 = R6\ 500$ $A = P(1+i)^n$, ✓A $= R6\ 500\left(1+\frac{8}{100}\right)^3$ ✓M $= R8\ 188{,}23$ per annum $= R157{,}464$ per week $\approx R157{,}46$ ✓CA	1M substitution 1A correct value of n 1CA simplification 1M substitution 1A correct value of n 1CA simplification (3)	12.1.3
3.3.1	✓A Row 5 column 2 ✓A	1A row 1A column (2)	12.3.4
3.3.2	3 ✓CA **OR** 4 ✓CA	1CA answer (1)	12.3.4
3.3.3	✓✓A South-east **OR** North-west **OR** South-west **OR** North-east **OR** To the right at the back **OR** To the left in front	2A answer (2)	12.3.4
3.3.4	✓A Total area = $32 \times 0{,}75\ m^2$ ✓M $= 24\ m^2$ ✓CA	1A using correct values 1M multiplying by whole number 1CA simplification from multiplication (3)	12.3.1 12.1.1
			[23]

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QUESTION 4 [16 MARKS]			
Ques	**Solution**	**Explanation**	**AS**
4.1.1	6 ✓✓A	2A answer (2)	12.4.3
4.1.2	$6\frac{1}{2}$ ✓✓A	2A answer (2)	12.4.3
4.1.3	$5\frac{1}{2}$ ✓✓A **OR** $\frac{5\frac{1}{2} + 5\frac{1}{2}}{2} = 5\frac{1}{2}$ ✓✓A	1A for identifying the $5\frac{1}{2}$ & $5\frac{1}{2}$ as the middle values 1A answer **Answer only full marks** (2)	12.4.3
4.1.4	$3\frac{1}{2}$, 4, $4\frac{1}{2}$; $5\frac{1}{2}$ ✓✓A (accept answers less than 5 or answers greater than 11 or any size not in boys data)	1A for every 2 correct sizes 1A for every 2 correct sizes (2)	12.4.3
4.1.5	14 ✓A : 15 ✓A ✓M	1M writing as a ratio 1A value for boys 1A value for girls (3)	12.4.3 12.1.1
4.2.1	Volume = length × breadth × height ✓M = 27,5 cm × 15 cm × 11,9 cm = 4 908,75 cm^3 ✓A✓A	1M substitution 1A simplification 1A correct unit **Answer only full marks** (3)	12.3.1
4.2.2	Number of boxes = $\frac{118\,cm}{11,9\,cm}$ ✓M = 9,915 = 9 ✓CA	1M division by 11,9 cm only 1CA maximum **Answer only full marks** (2)	12.1.1 12.1.2
			[16]

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QUESTION 5 [25 MARKS] (One penalty for incorrect rounding in this question only)			
Ques	**Solution**	**Explanation**	**AS**
5.1.1	Volume = $3{,}14 \times (18{,}5\text{ mm})^2 \times 10\text{ mm}$ ✓M $= 10\,746{,}65\text{ mm}^3$ ✓A ✓A **(using π: V = 10 752,10 mm^3)**	1M subsitution 1A simplification 1A unit **Answer only full marks** Penalize only once in 5.1.1 or 5.1.2 for unit (3)	12.3.1
5.1.2	Volume $= \frac{1}{2} \times 50\text{ mm} \times 43{,}3\text{ mm} \times 10\text{ mm}$ ✓M $= 10\,825\text{ mm}^3$ ✓A ✓A	1M substitution 1A simplification 1A unit **Answer only full marks** (3)	12.3.1
5.1.3	Total surface area of cylinder $= 2 \times 3{,}14 \times 18{,}5\text{ mm} \times (18{,}5\text{ mm} + 10\text{ mm})$ ✓SF $= 2 \times 3{,}14 \times 18{,}5\text{ mm} \times 28{,}5\text{ mm}$ ✓A $= 3\,311{,}13\text{ mm}^2$ ✓CA ✓A **(using π: TSA = 3 312,81 mm^2)**	1SF substitution 1A addition 1CA simplification 1A unit **Answer only full marks** (4)	12.3.1
5.1.4	Total surface area of triangular prism $= (50\text{ mm} \times 43{,}3\text{ mm}) + 3(50\text{ mm} \times 10\text{ mm})$ ✓SF $= 2\,165\text{ mm}^2 + 1\,500\text{ mm}^2$ ✓A $= 3\,665\text{ mm}^2$ ✓CA	1SF substitution 1A multiplication 1CA simplification **Answer only full marks** (3)	12.3.1

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Ques	Solution	Explanation	AS
5.2.1	1 sheet of gold foil wraps 12 chocolates ✓M 10 sheets wraps 120 chocolates ✓A ✓M	1M concept 1A simplification **Answer only full marks** (2)	12.2.1
5.2.2	Number of round chocolates = $6 \times (5 + 7)$ ✓SF = 72 ✓CA	1 M using correct formula 1 SF subsitution 1CA simplification **Answer only full marks** (3)	12.2.1
5.2.3	Number of triangular chocolates = $4 \times (5 + 7) + (12 \times 10)$ ✓M ✓SF = 168 ✓CA	1M using correct formula 1 SF subsitution 1CA simplification **Answer only full marks** (3)	12.2.1
5.3.1	$\frac{13}{50}$ ✓A ✓A **OR** 0,26 **OR** 26 %	1A numerator 1A denominator (2)	12.4.5
5.3.2	$\frac{0}{50}$ ✓✓A **OR** 0 **OR** 0 % **OR** impossible **OR** none	2A answer (2)	12.4.5
			[25]

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QUESTION 6 [24 MARKS]			
Ques	**Solution**	**Explanation**	**AS**
6.1.1	**P** = R4 600 + (R250 × 2) ✓SF = R5 100 ✓A ✓SF ✓SF R6 100 = R4 600 + (R250 × Q) **OR** R6 400 = R4 000 + (R400 × Q) 250 × Q = 1 500 400 × Q = 2 400 **Q** = 6 ✓A **Q** = 6 ✓A	1SF substitution 1A answer 1SF substitution 1A simplification **Answer only full marks** (4)	12.2.1
6.1.2 (a)	R4 000 ✓RT	1 RT answer (1)	12.2.3
6.1.2 (b)	7 ✓✓RT	2RT answer (2)	12.2.3
6.1.2 (c)	The team members would earn more money from Option B ✓A✓A	2 A answer (2)	12.2.3

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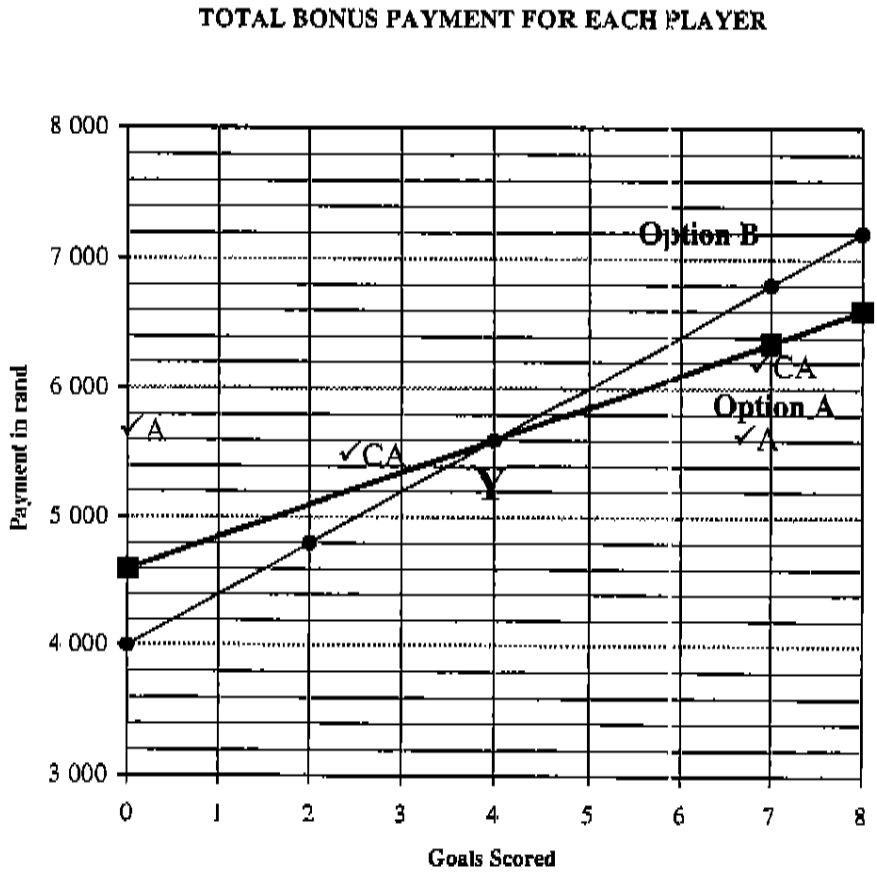
Ques	Solution	Explanation	AS
6.1.3			12.2.2

Number of goals scored	0	2	4	Q	7	8
Option A (in rand)	4 600	P	5 600	6 100	6 350	6 600
Option B (in rand)	4 000	4 800	5 600	6 400	6 800	7 200



1A vertical-intercept (0 ; 4 600)

1CA any other point correctly plotted

1CA correct line though P and Q and all other points correct

1A label

(4)

6.1.4	Point Y on Annexure A ✓✓CA	2 CA correct position (2)	12.2.3

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Ques	Solution	Explanation	AS
6.2.1 (a)	Perimeter = 2 (98 m + 72 m) ✓M = 340 m ✓A✓A	1M substitution 1A simplification 1A unit **Answer only full marks** (3)	12.3.1
6.2.1 (b)	Area of circle = πr^2 = 3,14 × (16 m)^2 ✓SF = 803,84 m^2 ✓A Area of semi-circle = $\frac{803.84m^2}{2}$ = 401,92 m^2 ✓CA **OR** Area of semi-circle = $\frac{1}{2}\pi r^2$ ✓M = $\frac{1}{2}$ × 3.14 × (16 m)^2✓SF = 401.92 m^2 ✓CA (**using π A = 402,12m^2**)	1SF substitution 1A Area of circle 1CA Area semi-circle 1M $\frac{1}{2}$ of area of circle 1SF substitution 1CA Area semi-circle **Answer only full marks** (3)	12.3.1

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Ques	Solution	Explanation	AS
			12.1.1
6.2.2	8,5 m takes 25 minutes 100 m will take $\frac{100\,\text{m} \times 25\,\text{minutes}}{8{,}5\,\text{m}}$ ✓M $= 294{,}11$ minutes ✓A $= 4{,}90$ hours ✓CA	1M using proportion concept 1A solution in minutes 1CA solution in hours **$4{,}90 = 4\frac{54}{60} = 4\frac{9}{10}$**	
	OR 100 m will take $\frac{100\,\text{m} \times \frac{25}{60}}{8{,}5\text{m}}$ hours ✓A ✓M $= 4{,}90$ hours ✓CA	1M using proportion concept 1A conversion to hours 1CA solution in hours	
	OR 1 m will take $\frac{25}{8{,}5}$ hours $= \frac{50}{17}$ hours ✓M ∴ 100 m will take $\frac{50}{17} \times 100 \div 60$ hours ✓A $= 4{,}90$ hours ✓CA	1M using proportion concept 1A conversion to hours 1CA solution in hours	
	OR $8{,}5 : 25 = 100\text{ m} : x$ $x = \frac{25 \times 100}{8.5} \div 60$ hours ✓M ✓A $= 4{,}90$ hours ✓CA	1M using proportion concept 1A conversion to hours 1CA solution in hours	
	OR $100 \div 8{,}5 = 11.7647$ ✓M $11{,}7647 \times 25$ min $= \frac{294}{60}$ hours ✓A $= 4{,}90$ hours ✓CA	1M using proportion concept 1A conversion to hours 1CA solution in hours	
	OR $\frac{25}{\frac{60}{8{,}5}} = \frac{x}{100}$ ✓M ✓A $8{,}5x = \frac{25 \times 100}{60}$ $x = 4{,}90$ hours ✓CA	1M using proportion concept 1A conversion to hours 1CA solution in hours (3)	
			[24]

TOTAL: 150

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